DOE/CS/30098-01
Volume 3 (of 4 Volumes)

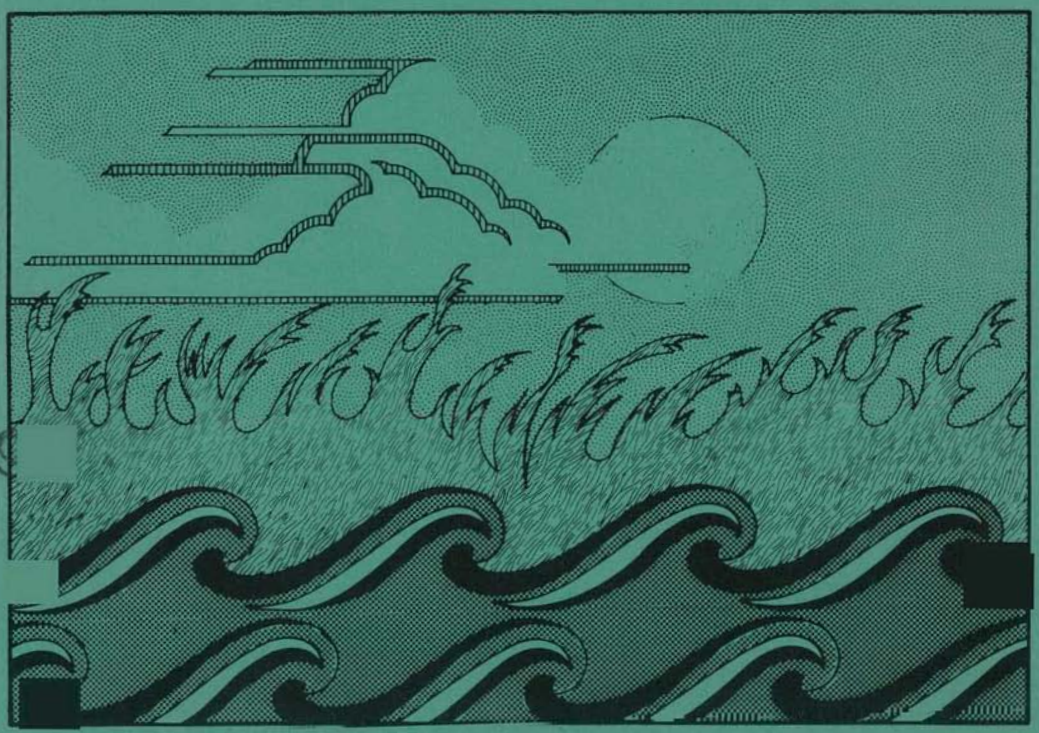
U.S. Department of Energy

July 1980

Assistant Secretary for Conservation & Solar Energy
Office for Solar Applications for Buildings
Under Contract No. FG01-79CS30098

Renewable Resources: A National Catalog of Model Projects

Volume 3: Southern Solar Energy Center Region



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Assistant Secretary for Conservation & Solar Energy
Office for Solar Applications for Buildings
Washington, D.C. 20585

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Volume 3 (of 4 Volumes)
Dist. Category UC 95A

Renewable Resources: A National Catalog of Model Projects

Volume 3: Southern Solar Energy Center Region

Prepared by:
Center for Renewable Resources
Washington, D.C. 20036
Under Contract No. FG01-79CS30098

July 1980

INTRODUCTION

This compilation of diverse conservation and renewable energy projects across the United States was prepared through the enthusiastic participation of solar and alternate energy groups from every state and region. Compiled and edited by the Center for Renewable Resources, these projects reflect many levels of innovation and technical expertise. In sum, they typify the drive and dedication that is being invested by small and large organizations and by people of all persuasions in finding alternatives to costly traditional energy paths.

In many cases, a critique analysis is presented of how projects performed and of the institutional conditions associated with their success or failure. The views expressed in the analyses are those of the local groups preparing the particular sections. As such, they provide the advantage of first-hand experience.

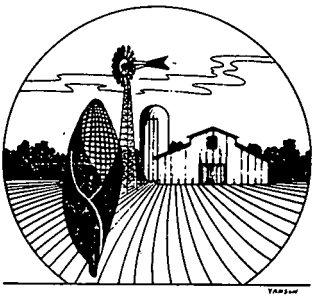
Some 2000 projects are included in this compilation; most have worked, some have not. Information about all is presented to aid learning from these experiences.

The four volumes in this set are arranged in state sections by geographic region, coinciding with the four Regional Solar Energy Centers. The table of contents is organized by project category so that maximum cross-referencing may be obtained.

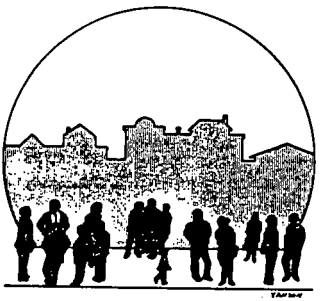
The Department of Energy is grateful to the hundreds who participated in gathering the descriptions presented here. These projects represent the creativity and determination of millions of Americans to take the energy challenge in hand and to produce results.

LEGEND

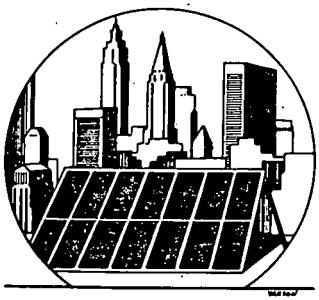
The following symbols are used throughout the catalog to represent the categories into which the projects fall.



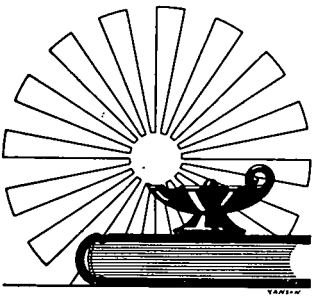
Agricultural



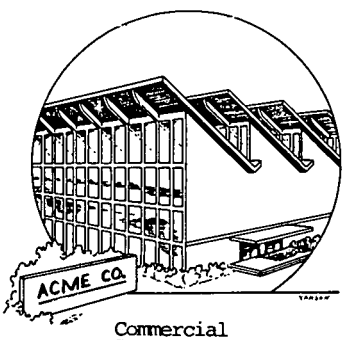
Community



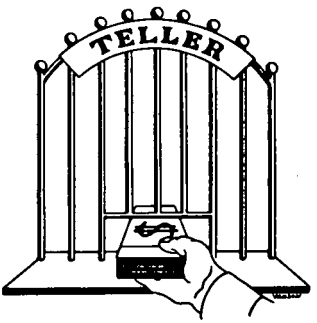
Cities



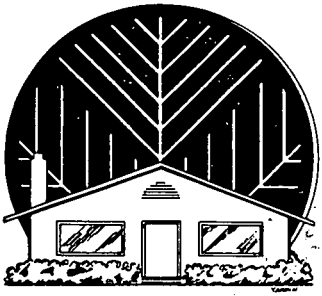
Education



Commercial

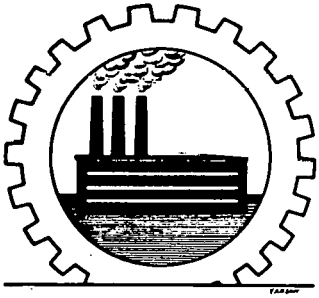


Financing



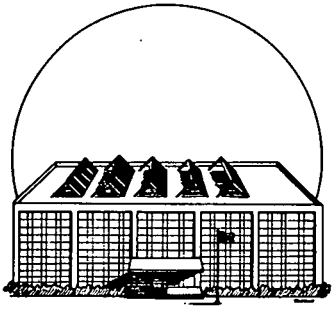
Housing

Legislation

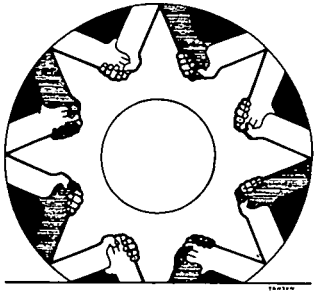


Industrial

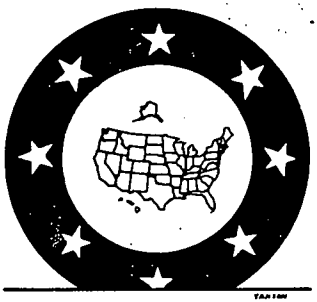
Low Income



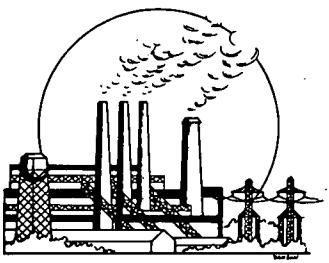
Institutional



Outreach



State



Utility

RENEWABLE RESOURCES

A NATIONAL CATALOG OF MODEL PROJECTS

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16. Northport
17. Selma
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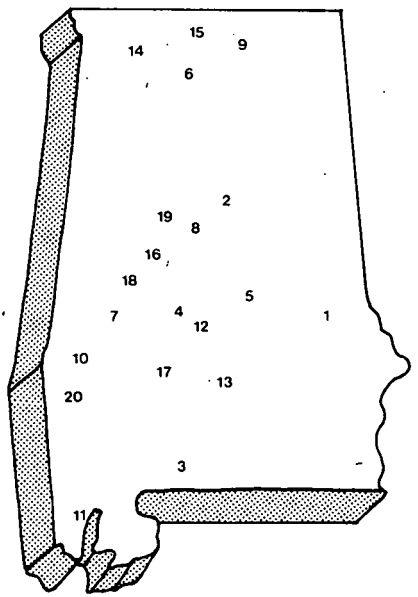
20. York



ALABAMA

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Category	Agricultural
State	AL
Project Name	Federation of Southern Cooperatives

Organization	Federation of Southern Cooperatives (FSC)
Address	P.O. Box 95 Epes, AL 35460
Contact	Fred Cooper
Telephone	(205) 652-9676

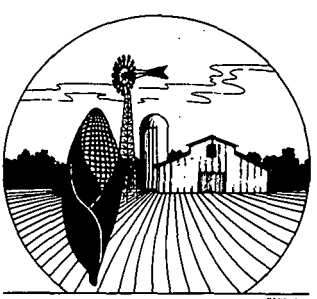
Funded By	CSA and other grants
Cost	$350,000
Congressional District	State-wide
Compilation Date	February 1980

The Federation of Southern Cooperatives (FSC) is a service, resource and advocacy organization serving a constituency of 30,000 low-income families representing over 100 cooperatives.

The Rural Training Research Center in Epes, Al, is the nerve center of FSC's programmatic and outreach work. Located on 1,300 acres of farmland in rural Sumter County, the Center is staffed by a core technical assistance group including specialists in agriculture, credit union management, animal husbandry, housing construction and energy conservation.

The Center offers conferences, demonstrations, meetings and workshops to coop members. FSC programs include a Small Farm Energy Conservation Project and a Solar Greenhouse/ Summer Porch construction program. The FSC has also organized projects in housing for low-income residents (Farmworker Housing Rehabilitation Program), in legal assistance (Judicare Program), education (Right to Read Program), health, and rural economic development.

Over the years the Center has evolved into a large building complex, including administrative offices, a cafeteria/ auditorium, dormitory, printing plant, workshops and barns. A library/classroom facility is now being planned that will incorporate solar hot water and passive solar design. Its buildings have been retrofitted with the energy conservation measures taught in seminars including weatherproofing, insulation and conversion to wood heat, where practical. The FSC also retrofitted a greenhouse to its dormitory building.



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AL
Project Name	Solar Greenhouses/ Summer Porch
Organization	Federation of Southern Cooperatives
Address	P.O. Box 95 Epes, AL 35460
Contact	Fred Cooper
Telephone	(205) 652-9676
Funded By	CSA and other grants
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

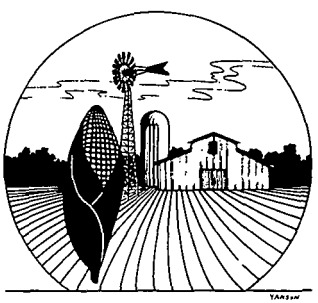
As part of the Federation of Southern Cooperatives' Small Farm Energy Conservation Project, 12 greenhouses were constructed in 1978 for low-income rural families. The structures were designed to reduce residential energy consumption while providing the opportunity for small-scale agricultural cultivation.

Project staffers quickly realized that the lean-to greenhouses, measuring an average of 10' x 16', would have to be modified for the hot spring, summer and autumn sun of the southeastern U.S. After several experiments, the project began building structures with a removable front; with the front open, and with the addition of a greenhouse cloth—or similar shade material—over the glazed roof, the greenhouse serves as a cool, shaded summer gardenplace. By wetting the gravel or soil during the hot-test days, the owner can more effectively cool the building.

Manuals were prepared by the project staff to assist individuals in the construction and operation of their solar greenhouses. The publication gives step-by-step instructions in areas of design, layout, heat storage, and planting techniques.

The project staff worked with the co-op membership in construction of the greenhouses. Between two and four people usually did the bulk of the work, although six to ten others generally helped paint and caulk the structure.

Critique/analysis: The greenhouse was chosen as a major project with SFECP because of its simplicity of construction and operation. The greenhouse can both heat and cool a residence while producing food (and income) for its owners.



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AL
Project Name	Solar Soybean Dryer

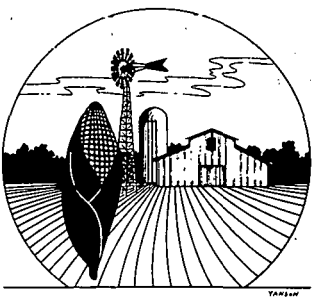
Gold Kist Soy, Inc., has installed a 13,000 ft^2 solar collector system, reportedly one of the world's largest, to dry soybeans. The $580,000 collector array is expected to save the company 25,000 gallons of #5 fuel oil annually.

The 672 collectors are 24 degrees east of south. A 15 degree collector tilt was chosen as a trade-off between efficiency and greater structural costs of higher tilt angles.

The system's operational testing and evaluation was conducted from June of 1978 through May of 1979.

Critique/analysis: System construction costs were $44,260 ft^2 or about the average of commercially installed residential heating systems. This project should demonstrate the economic feasibility of industrial-process applications.

Organization	Gold Kist Soy, Inc.
Address	1400 Market Street, NE Decatur, AL 35601
Contact	Mr. Mitchell
Telephone	(205) 350-1666
Funded By	DOE
Cost	$1,110,000
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

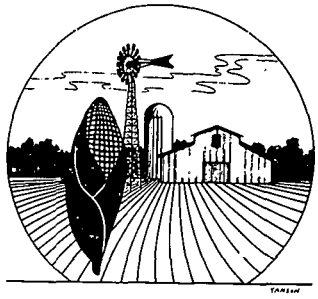
Category	Agricultural
State	AL
Project Name	Solar Worm Bed

As an outgrowth of its solar greenhouse construction activities, the FSC Small Farm Energy Conservation Project has constructed a solar worm bed.

Designed on passive solar principles, the structure's tin roof protects the worm bed from overheating during the summer months, while allowing added sunshine as the cold weather approaches.

Critique/analysis: The passive solar design reportedly increases the worm output and allows for easier worm retrieval in winter months.

Organization	Federation of S ern Cooperative
Address	P.O. Box 95 Epes, AL 35460
Contact	Fred Cooper
Telephone	(205) 652-9676
Funded By	CSA and other grants
Cost	n/a
Congressional District	VII
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Agricultural
State	AL
Project Name	SWAFCA Alcohol Still

The Southwestern Alabama Farmers Cooperative Assocation, Inc. (SWAFCA) is a black-oriented business enterprise serving ten counties in Alabama's "blackbelt"-- a predominantly low-income area representing the largest community of rural blacks in the nation.

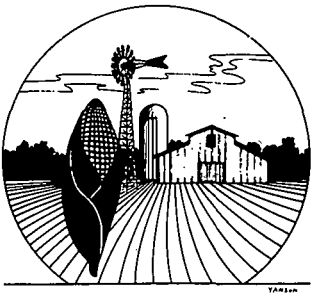
In an effort to attain economic and political security, and to stem the increasing tide of migration to the north, SWAFCA recently built a $15,000 alcohol distillery at its new office and warehouse facility in Selma. The system is capable of producing 3,000 gallons of alcohol weekly using crops grown by co-op members. The project also serves as the groundwork for a proposed $1.9 million cattle feedlot, methane and fertilizer production project.

The alcohol still was constructed using recycled materials, where possible, and 10-gauge steel. The still has a 16 ft. distillation tower connected to three four-ton vats, which serve as the pre-cooler, fermenter and distiller. There are no moving parts in the system: fluids move by gravity, and the mash is agitated by steam.

The system processes approximately one ton of corn to produce 90 gallons of alcohol. The vats are heated by wood waste, tires, or any inexpensive, easily-obtainable fuel. The alcohol is stored in two 2,000-gallon tanks.

SWAFCA currently has proposals pending before the Farmers Home Administration (FHA) and the Economic Development Administration (EDA) for an expansion project to develop a sophisticated facility capable of producing methane, alcohol and fertilizer.

Organization	Southwestern Alabama Farmers Cooperative Association, Inc.
Address	P.O. Box 955 Selma, AL 36701
Contact	Albert Turner
Telephone	(205) 872-6228
Funded By	Office of Minority Business Enterprise, Dept. of Commerce
Cost	$305,000 (two years)
Congressional District	VII
Compilation Date	February 1980



Beginning with the development of a 2,000 cattle feedlot, SWAFCA would purchase member crops, feed the dried grains (or wet mash from the alcohol process) to the cattle, and collect the resulting manure for methane production. Manure would be returned to the fields as fertilizer.

Critique/analysis: A slaughterhouse/meat-packing facility, a dog-and cat-food processing plant (from meatpacking waste), and a fertilizer plant will be built to insure 100 percent utilization of the resources. The facility would create jobs for the rural low-income families, while providing an outlet for farmers' crops.

According to Albert Turner, SWAFCA director, the proposed plan would revitalize the co-op and the agri-belt in the South by providing a crop market for co-op members. Turner reportedly places more emphasis on the project's economic development potential than on energy production.

Problems were encountered during the initial project start-up, when fermentation halted due to temperature fluctuations. The only other difficulty encountered was when the Bureau of Alcohol, Tobacco & Firearms required SWAFCA to post a $10,000 bond to operate the alcohol still. Turner reportedly feels the bond is unnecessary.

Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	AL
Project Name	City of Tuscaloosa Energy Systems Plan

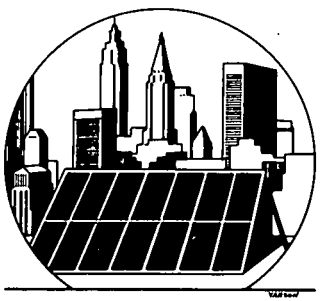
The Tuscaloosa Energy Systems Plan represents the cornerstone of the town's future Comprehensive Community Energy Management Plan. The City introduced its energy packet with an in-house conservation project of City Hall, which included the adoption of a 70-foot-candle lighting standard and weatherization of the building, together with a retrofit of the heating and cooling system.

These efforts have saved the city $47,489.83 in energy bills in the past two years. Other municipal energy projects include Vehicle Management Plans (the city is changing all its cars to 6-cylinders), the Energy from Refuse Study, Traffic Management Savings, and an Intergovernmental Pilot Program.

Secondary programs implemented by the city included participation in the Oil Recovery Program (Project R.O.S.E.), Community Service Programs, and assistance to Alabama Power Company in their conservation efforts. Of key importance to the City's Energy Systems Plan has been involvement of the public through the Mayor's Advisory Committee for Energy Conservation. The city has also developed a Contingency Plan for Energy Emergencies.

Critique/analysis: A very successful energy plan for the city is well underway. Actually, the only problem encountered thus far has been with the Traffic Management. The city eliminated its continuous roadway lighting after 12 p.m. in an effort to conserve energy and money. The results were excellent; citizens were pleased at the conservation effort and no increase was reported. However, the lights were eventually turned back on because Alabama Power Company would not decrease its flat rate light bill, even though better than 40 percent of the energy was saved. Later, 129 nonessential lights were totally disconnected, saving $10,000 annually.

Organization	City of Tuscaloosa
Address	Energy Management Division, City Hall Tuscaloosa, AL 35401
Contact	William Koeppel John Hand
Telephone	(205) 349-2010
Funded By	City of Tuscaloosa, AEMB, CETA (one worker)
Cost	$22,000
Congressional District	V
Compilation Date	February 1980



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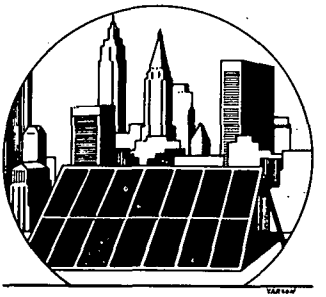
Category	Cities
State	AL
Project Name	Huntsville Senior Citizens' Center
Organization	City of Huntsville, Center
Address	125 Earl Street Huntsville, AL 35805
Contact	Glenn E. Wallace
Telephone	(205) 532-7418
Funded By	ERDA; City of Huntsville
Cost	$188,534
Congressional District	V
Compilation Date	February 1980

In 1976 the city of Huntsville obtained a grant to construct a solar demonstration project at the Huntsville Senior Citizens' Center. The building now sports almost 1,800 square feet of liquid-solar-collector units mounted on integrated pre-assembled panels on the structure's east-west wall.

The system produces 60 percent of the building's space heating, and 80 percent of its hot water needs.

The Center's location in the heart of Huntsville's Civic Center Park required that the solar design be integrated with the building. The resultant design consisted of triangular rib-like vertical sections along the Center's south wall. The collectors are tilted 30 degrees away from the wall to accomodate the building's 34 degree east-of-south orientation.

The building was originally constructed in 1959 as a recreational facility. In 1972 the structure was converted into a center for the elderly. In 1975 the city carried out various conservation measures in the building in preparation for the proposed solar heating system.



Renewable Resources— A National Catalog of Model Projects

Category	Cities
State	AL
Project Name	Mobile Solar Demonstration

Mobile has installed a solar hot water and space heating system on the new Buildings and Grounds Department Administration Office as its contribution to the National Energy Conservation Program.

The system consists of six liquid collector panels for domestic hot water, and 30 air-type collector panels for space heating needs. The installations are expected to provide nearly 100 percent of the buildings hot water needs, and 65 percent of its heating requirements.

A solar space cooling system was considered too expensive for the project.

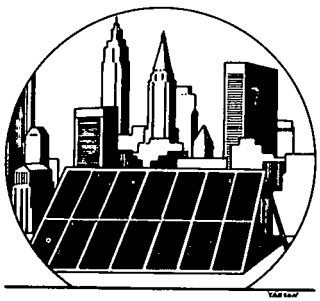
All solar equipment, pipes and controls will be labeled and color-coded to enhance the demonstration potential of the project. A display in the building's main entrance will hold engineering flow charts, drawings and pictures explaining the system technology.

Engineers expect the system will save the city an equivalent of 51 barrels of oil yearly. The system will pay for itself in five years.

The Sheet Metal Workers Union journeymen and apprentices, together with a SMWU solar engineer, have volunteered to assist in the design, construction and installation of the system, saving the city between $6-$10,000.

ique/analysis: By getting the Sheet Metal ....ers Union to participate and gain valuable experience in the project, the Architectural Division has saved over two-thirds the projected costs. To quote Division's Director, Michael Guarino, "This is a good example of how anything is possible when local government, labor and city staff put their heads together for a common goal and get the best for the least amount of funds."

Organization	City of Mobile Architectural Engineering Division
Address	P.O. Box 1827 Mobile, AL 33601
Contact	Michael A. Guarino, P.E.
Telephone	(205) 438-7454
Funded By	Alabama Energy Management Board Grant ($6,000)
Cost	$19,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Cities
State	AL
Project Name	Municipal Recycling Program
Organization	City of Tuscaloosa
Address	City Hall Tuscaloosa, AL 35401
Contact	Ms. Frances Nelson
Telephone	(205) 349-2010
Funded By	City
Cost	$6,000
Congressional District	VII
Compilation Date	February 1980

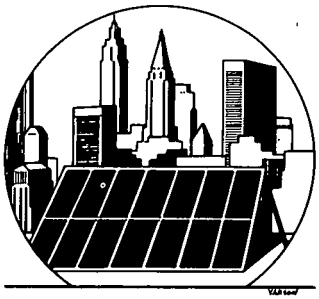
Tuscaloosa implemented an experimental household solid waste recycling project involving 150 local residences that, if implemented on a regular basis, would save the city approximately 175,000 million Btu annually.

The project took place over a 14-week period, during which participant households collected and sorted colorless glass, steel and aluminum cans, newsprint, cardboard, plastics, and colored glass. Over 18,000 lbs. of recycleables were recovered.

Based on project results, the city has estimated that a proposed yearly collection of 10,046 tons would net the city $228,586, not including a $96,000 savings on conventional land fill costs. Projected capital costs for the full-scale recycling facility would be $960,000. Annual operation costs would be approximately $212,700 leaving an estimated project revenue of $111,800.

The demonstration involved the participation of households from a selected section of Tuscaloosa. Public attitudes toward recycling were studied before the project was implemented. The recycling program was administered in cooperation with the Mineral Resources Institute of the University of Alabama, which provided technical support and consultation services.

Critique/analysis: The pilot project has proven the economic and practical feasibility of a municipal recycling program. Tuscaloosa is not awaiting financing of the project by private interest, or by other capital sources. The overwhelming participation of the public (98 percent of the project - group) demonstrates the degree of public concern with the energy crisis and resource depletion.



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	AL
Project Name	Photovoltaic Signal System

Organization	Southern Railway
Address	P.O. Box 1808 Washington, D. C. 20013
Contact	William F. Geeslin Asst. Vice President
Telephone	(202) 383-4000

Funded By	Southern Railway, Co.
Cost	n/a
Congressional District	I
Compilation Date	February 1980

This project, sponsored and funded by Southern Arilway, is Alabama's first solar photovoltaic project. Located at the railroad crossing of the Tombigbee River near Jackson, AL, the photovoltaic array controls signals and circuits for the drawbridge crossing.

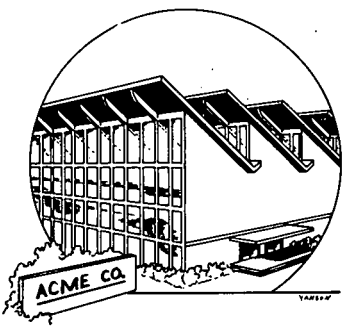
Since 1976, Southern has developed a photovoltaic drawbridge approach lockout circuit at the Jackson location, as well as photovoltaic installations at Caldwell, Crudup, Eaglewood, Kimbrell, McClendon, McClure, Sibert, Stelle, Westbrook, and Woodall.

The railway first installed generators to power switching devices, but insects kept clogging the equipment air intakes. Primary batteries were next used, but were discontinued due to high replacement costs. This led to an experimental installation of the Lake Pontchartrain facility, which proved successful. Since then 30 switching systems have been converted to photovoltaics.

Besides the crossing and drawbridge applications, Southern also installed photovoltaic arrays on forty of its cabooses to power rear markers. The results were so successful that the company plans to convert rty more cabooses.

The 1979 cost per caboose for photovoltaic conversion was $2,300, down from $3,300 in 1978.

Critique/analysis: Southern's zeal for solar energy was generated by the high operation costs or technical problems encountered at remote locations. Its projects exemplify technology integration in a market where



conventional energy previously was the only answer. No problems have been encountered at the Jackson installation. Only five power failures have been reported in the installation (3 by vandalism, 1 by a loose-wire connection, and 1 by a stopped work train that drained the system for 10 hours per day for 13 days in cloudy weather).

Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	AL
Project Name	Wood-waste Boiler

Organization	Seaman Timber Company, Inc.
Address	P.O. Box 372 Montevallo, AL 35115
Contact	James D. or Janet Seaman
Telephone	(205) 665-2536

Funded By	Company
Cost	$210,000
Congressional District	VII
Compilation Date	February 1980

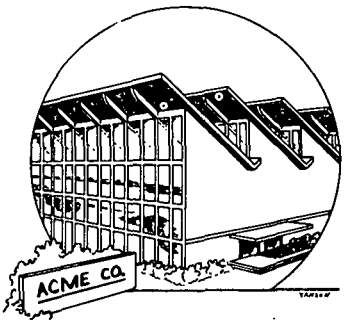
Seaman Timber Company began utilizing its waste wood in 1975 with the installation of a wood-fired boiler system. The boiler generates 8,000 lbs./hour of steam, which is used in the company's wood drying kiln.

The operation consumes 35 tons daily of waste green hardwood, sawdust and bar. The fuel is relatively pollution-free. Annual savings have been estimated at $75-$80,000 a year, with an additional $87,000 savings in previous waste removal costs.

Upon installation, the boiler initially powered a plant generator that produced 100 percent of the plant's electrical needs. However, major equipment damage suffered during a utility power failure forced the company to discontinue the electric service, afterwhich it provided the University of Montevallo with wood waste for its boilers.

The project was initially due to escalating gas prices and disruptions. In 1975 the system saved 23 million ft^3 of natural gas, representing a savings of $30,000.

Critique/analysis: The owners are reportedly so convinced of the benefits of the system that would convert the entire operation to waste if funding were available for the $2-2½ million expenditure. No additional employees are needed to operate the system. The boiler has no energy supply interruptions, no energy cost escalation, and utilizes a renewable energy resource. Ms. Seaman noted: "One of the system's best advantages is that it eliminates the necessity for standby fuels."



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	AL
Project Name	Birmingham Re ng Project
Organization	Alabama Conservancy, Inc.
Address	Box 104 Helena, AL 35080
Contact	Lee Laechelt
Telephone	(205) 798-2310
Funded By	Self-supporting
Cost	$10,000 annually
Congressional District	VI
Compilation Date	February 1980

The Conservancy recycling project is the oldest, and reportedly the most successful, recycling effort in Alabama. For over five years the project has annually recycled 650 tons of newsprint, paper, steel, aluminum, glass and garbage for the residents of Birmingham, at a savings to the city of approximately $7,000 per year.

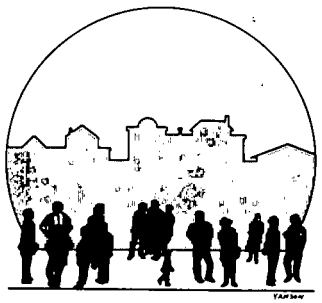
The recycled materials include 265 tons of newsprint, 175 tons of paper, 4.75 tons of aluminum, 27.5 tons of steel, 175 tons of glass, and several tons of garbage per year.

The project saves magazines, which are distributed on a bookmobile. The Alabama Conservancy also works on Project R.O.S.E. (Recycled Oil Saves Energy), coordinated by the Alabama Energy Management Board. As another service, the project also collects an estimated 250 tons of wood chips for members' gardens.

Annual project revenues average $12,000. The $2,000 profit after expenses is deposited in a trust fund.

A proposed project spin-off (funded in part by a $10,000 contribution from concerned businessmen) is the hiring of unemployed youth to collect garbage in highly littered areas of Birmingham.

Critique/analysis: Over the years, the recycling project has developed credibility within the Birmingham business community as a viable alternative to land-filling, and as a significant energy-conservation measure.



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	AL
Project Name	FSC Small Farm Energy Conservation Project
Organization	Federation of Southern Cooperatives
Address	P.O. Box 95 Epes, AL 35460
Contact	Fred Cooper
Telephone	(205) 652-9676
Funded By	CSA & other grants
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

Energy conservation and development of alternative energy resources have been matters of increasing priority among the cooperatives and families of the Federation of Southern Cooperatives (FSC).

Consequently, the FSC initiated the Small Farm Energy Conservation Project to reduce small farms' dependence on fossil fuels. Primary emphasis is on wood heat, passive solar systems, alternative agricultural techniques, and farm/house energy conservation.

The project began by gathering energy-use data from 125 participating farmers from five FSC member cooperatives. Conservation cost analyses were then made, including a market analysis for new crops that require less fossil fuels for cultivation.

When the data base was compiled, demonstration workshops in wood heat, greenhouse, energy conservation and alternative plant cropping were held. During 1978 about 20 manuals and other educational materials detailing woodstove construction and greenhouse design were published. In 1979, after a full winter of operation, the recipients were surveyed. Homeowners reported that heating bill savings from conservation, wood heaters,or solar greenhouse installations ranged from $150 to $325.

The Project participants, being of limited , are also able to take advantage of SC's revolving no-interest loan fund.

Critique/analysis: Examples of project cooperation abound; but the point to be made is that SFECP works with people, not just stoves, greenhouses and new crops. It has attempted to teach people new skills while installing the energy-efficient hardware.

Renewable Resources— A National Catalog of Model Projects

Category	Community
State	AL
Project Name	Greenhouse Workshops

"What can cut your heating bill by 20-40 percent next winter, produce fruits, vegetables, or potted plants worth up to $500 a year for the table or to sell, and costs only about $500 to build?"

So reads the announcement of a workshop held in Tuscaloosa, and other parts of the Southeast on solar greenhouse design and construction.

The workshops were open to the public, and were held at the University of Alabama and in a meeting room at a local bank.

The workshops were designed so that participants with a little time and a few basic carpentry skills could build an attached solar greenhouse. Horticultural skills and information regarding thermal mass heat storage were also discussed.

The workshop stressed low cost, simple construction using a minimum amount of wood and a maximum amount of recycled materials. Coinciding with the workshops was a week-long solar greenhouse demonstration workshop conducted at a Tuscaloosa Housing Project.

Workshops conducted in Tuscaloosa were co-sponsored by the Program of Rural Services & Research, the Agricultural Marketing Project, the Tuscaloosa Housing Authority, and the Solar Energy Coalition.

Critique/analysis: The workshops offered sufficient information to allow interested persons to return home and construct their own greenhouse. The workshops would have been more effective had there been funds to assist in their projects. The hands-on workshops held in conjunction with the design-theory workshops, did allow persons to obtain first hand information on construction.

Organization	Univ. of Alabama College Health Science
Address	P.O. Box 6291 University, AL 35486
Contact	Bill Dow
Telephone	(205) 348-7942

Funded By	Southern Regional Council, Foundation Grants, & Youth Project
Cost	$1,300-$1,900 per demonstration
Congressional District	VII
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

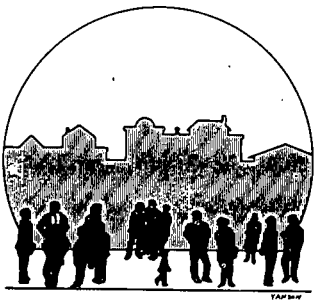
Category	Community
State	AL
Project Name	Woodstove Construction Project
Organization	Federation of Southern Cooperatives
Address	P.O. Box 95 Epes, AL 35460
Contact	Fred Cooper
Telephone	(205) 652-9676
Funded By	CSA and other grants
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

The FSC's Woodstove Construction Project was created to produce low-cost, high-efficiency woodburners out of recycled or relatively inexpensive materials.

The FSC stoves are constructed from recycled propane tanks or 10-gauge steel, and are designed for a heat output of 65,000 to 70,000 Btu per hour. Material costs for the heaters average about $100; installation and chimney costs average $105.

A workshop, led by a Vermont woodstove expert, Luther Green, was developed to acquaint persons with the principles and basic design of woodstoves. A supplemental booklet offers instructions and photographs of various stages of construction, together with explanations of draft principles, secondary combustion, safety precautions, and firewood recommendations.

Through the course of 1978 the Small Farm Energy Conservation Project installed over 20 of the Co-op woodstoves in member's homes or offices. The units meet all National Fire Protection Standards. The project is still in operation, producing stoves for low-income FSC members that will be installed in the winter of 1979.



Renewable Resources— A National Catalog of Model Projects

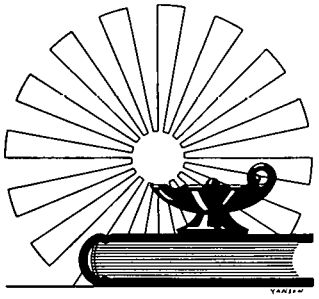
Category	Education
State	AL
Project Name	Abernant Solar Elementary School
Organization	Tuscaloosa Board of Education
Address	2314 9th Street Tuscaloosa, AL 35401
Contact	Dr. Charles Sprayberry
Telephone	(205) 758-0411
Funded By	Grant Proposal before the DOE
Cost	n/a
Congressional District	VII
Compilation Date	February 1980

The Tuscaloosa County Board of Education is awaiting federal funding that would allow them to begin construction of the state's first building and school fully serviced by solar energy for its electric needs.

The proposed Abernant Elementary School is presently designed to derive all of its electric power from a system of photovoltaic cells. By using solar energy for hot water, heating and cooling, and by implementing various conservation measures (window overhangs, earth-berming, and maximum insulation), engineers plan to reduce the need for, and therefore the use of, solar-generated electricity.

The school has already been designed. Construction awaits the lifting of a freeze on bond issues ordered by Gov. Fob James. Depending on the size of the grant, the school has plans for a variety of solar applications. If DOE funds the solar portion of the school, solar energy will be used to heat, cool and electrically power the building.

Critique/analysis: The Board of Education feels that although the cost of a solar school is substantially higher than a conventional energy system, the projected energy savings would pay for the additional cost within a few years. It is ununknown at the time of printing whether funding for the photovoltaics will be available.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	"The Carrying Capacity of the Earth"

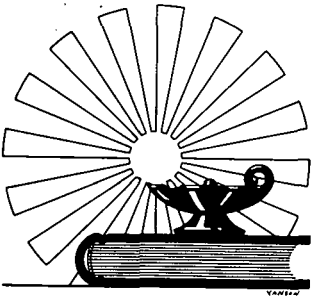
Organization	Livingston University
Address	College of General Studies, Div. of Natural Sciences Livingston, AL 35407
Contact	Wayne P. Canis, Ph.D.
Telephone	(205) 652-9661

Funded By	Livingston University
Cost	Tuition
Congressional District	VII
Compilation Date	February 1980

The overall class theme is "The Carrying Capacity of the Earth," as it relates to natural resources, energy, food, quality of the environment and population. Conservation is a major reocurring course topic ranging from the traditional recycling of resources such as glass, iron, and aluminum, to the total recycling of municipal and industrial wastes. Students are taught that despite energy savings, a "new" non-polutting, renewable energy source is essential. This class discusses existing solar technologies, including active and passive solar systems.

Students are encouraged to watch recent trends in energy conservation and development in the news media.

Critique/analysis: General education courses relating to solar energy and appropriate technology are limited in Alabama. Considering that the major universities in the state don't offer solar engineering curricula, this class is a breakthrough of sorts.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	Escambia County Solar High School

The Escambia County High School is the first public building and school in Alabama to use solar energy. But equally unique is that the school's $323,800 solar construction was funded completely through community contributions.

Central to the building's energy system are 4,032 ft^2 of drainable, evacuated tube collectors that, in conjunction with comprehensive design, provide for 85 percent of the building's space heating and 100 percent of its hot water needs. The solar collectors also provide 60 percent of the structure's cooling requirements through a lithium bromide absorption chiller unit.

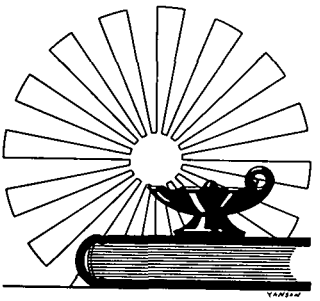
Building design incorporates earth berming, roof overhangs, and air locks at building entrances to minimize loss of interior temperature.

The solar system is presently monitored by private firms. The initial payback period of 20 years may be over-estimated, according to the county's Superintendent of Education.

An energy curriculum is now being written for use in the school's vocational training program. The program is expected to study the building's design for classes in solar technology and energy management. Radio, television, computer science and heating/air conditioning classes also study the system.

Critique/analysis: No technical problems have been encountered. The Superintendent underscored the project's educational value. A noteworthy observance in this project is that the community was far-sighted enough to opt for solar energy for the long-term savings.

Organization	Escambia County Board of Education
Address	P.O. Box 307 Brewton, AL 36426
Contact	Harry L. Weaver
Telephone	(205) 867-3465
Funded By	Private, local donations
Cost	$323,800
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	Grant Writing Workshop
Organization	Solar Energy Coalition-Alabama
Address	P.O. Box 163 Coaling, AL 35449
Contact	David S. Pate, Executive Director
Telephone	(205) 556-4556
Funded By	Georgia Solar Coalition (By a Reg. IV DOE Grant)
Cost	$150
Congressional District	State-wide
Compilation Date	February 1980

A series of public workshops were conducted by the Solar Energy Coalition-Alabama for the Department of Energy's Appropriate Technology Small Grants Program in Alabama. Workshops were held in Birmingham, Tuscaloosa, and the Sun Day activities at the University of Montevallo.

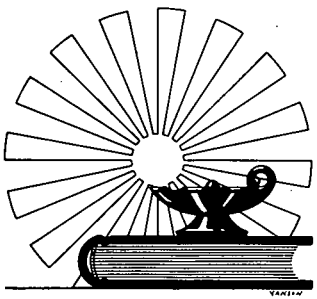
The workshops were designed to give technical assistance on how to prepare and submit proposals for grants in energy research and development.

The public was invited and substantial advertising produced good turnouts for all three meetings.

The free workshops averaged 25 attendees. Individual assistance was provided for grant applications needing help on specific items. Questions raised by attendees dealt with the amount of funding, types of projects to be funded, and such specifics as completing project milestones and budgets.

An important side benefit of the workshops was the opportunity for the appropriate technology community in Alabama to assemble and meet one another and exchange ideas.

Critique/analysis: The workshops were arranged and coordinated at the last possible minute, complicating the execution of the workshops. The funding was inadequate. The unanimous response was that the workshops were extremely beneficial, and that they should be expanded and conducted in other parts of the state. As a result of the workshops and the promotion of the workshops and Small Grants Program, there was a remarkable increase in the number of grant applications submitted, and an overall increase in the quality of proposals submitted.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	League of Women Voters (LWV)

Organization	League of Women Voters (LWV)
Address	1528 Valley Avenue Birmingham, AL 35209
Contact	Mary Lear
Telephone	(205) 933-6446

Funded By	DOE
Cost	$2,800
Congressional District	State-wide
Compilation Date	February 1980

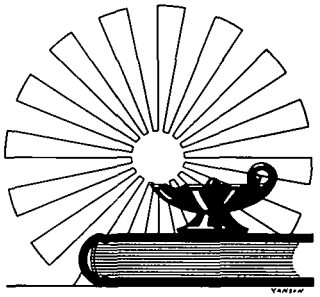
In 1977 the LWV Energy Education Project was created to increase public awareness of energy problems, to look for practical immediate solutions to the problems identified, and to encourage Alabama's local leagues to undertake local energy projects.

The project was implemented through a state-wide energy workshop and six local projects.

Among the activities conducted by local chapters were an energy awareness week, sponsored by the Muscle Shoals League; a recycling education project, sponsored by the Morgan County League; a solar energy meeting, sponsored by the Baldwin County League; and an energy fair held at a local mall, sponsored by the Mobile League.

Conservation and alternative energy meetings are currently being conducted by the LWV in Alabama. It is believed that the above projects have reached over 2,000 state residents.

Critique/analysis: Public outreach of the Alabama LWV under the DOE contract has been exceptional. Not only has a large percentage of the general population been reached, but the education training to the local chapters has enabled them to continue the outreach on a localized basis.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	NASA Solar Research

NASA is currently conducting ASHRAE* 95-P tests of solar systems in conjunction with the Tennessee Valley Authority's Solar Nashville Project. Those systems that pass the test will qualify for the utility's program, which is scheduled to install 10,000 solar water-heating systems in Nashville over the next three years.

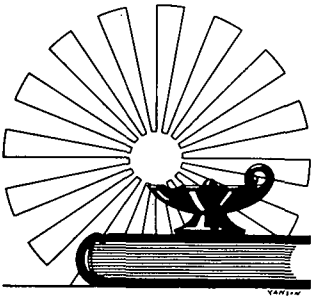
Other NASA projects for DOE include research and development projects on Rankine Cycle Air Conditioners (a 25-ton unit will be installed on the base medical facility), solar-assisted heat pumps, evacuated tube collectors, eutectic salt storage mediums, absorption air conditioners, and the proposed solar satellite power systems.

The Redstone Arsenal also operates several solar demonstration facilities, which are visited primarily by DOE personnel and foreign dignitaries.

*ASHRAE is the American Society for Heating, Refrigerating and Air Conditioning Engineers

Organization	NASA
Address	FA-32 Building 4201 Marshall Space Flight Center, Huntsville, AL 35812
Contact	Charles Norman Thomas
Telephone	(205) 453-3545

Funded By	DOE
Cost	n/a
Congressional District	V
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	AL
Project Name	Solar-powered Car

University of Alabama professor Dr. Edward Passerini has developed the prototype of an electric car that will eventually be powered by the sun.

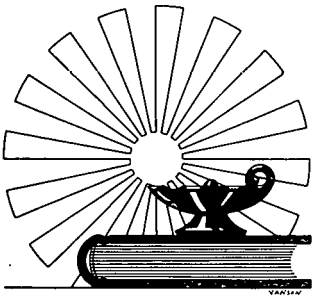
Utilizing an array of solar cells on its flat roof, the 350 lb. tri-wheeler will be capable of carrying two passengers 60 miles at 45 miles per hour. Three 12 volt batteries, currently charged by conventional means, power the car's two and one-half horsepower electric engine.

A small array of solar cells are now installed in the car to demonstrate how the photovoltaic system is designed to operate. Passerini plans to incorporate the system when the cost of solar cells drops sufficiently.

The car reportedly has drawn avid interest at energy fairs.

Critique/analysis: Dr. Passerini feels solar cars will soon become a reality. However, his project is underfunded and understaffed. An Appropriate Technology Small Grant request has been made of DOE for further research and development of the prototype. Dr. Passerini is a professor of Environmental Studies and the Humanities at the University of Alabama.

Organization	Dr. Edward Passerini
Address	New College Univ. of Alabama P.O. Drawer CD University, AL 35486
Contact	Dr. Edward Passerini
Telephone	(205) 348-4600
Funded By	Private
Cost	$1,000
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AL
Project Name	Tuscaloosa Housing Authority CETA Solar Project
Organization	Tuscaloosa Housing Authority
Address	Woodmont Social Services P.O. Box 2281 Tuscaloosa, AL 35401
Contact	James Horton
Telephone	(205) 553-2485
Funded By	CETA
Cost	$27,000
Congressional District	VII
Compilation Date	February 1980

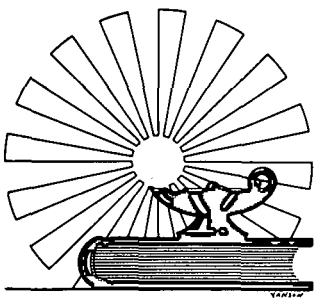
The Tuscaloosa Housing Authority - CETA Solar Project was designed to train economically disadvantaged youths in the construction and installation of simple, low-cost solar systems for low-income housing in Tuscaloosa County.

The solar systems, built by CETA workers, include greenhouses, thermosiphon hot water units, and low cost window "heat grabbers." All collectors and greenhouses are monitored for efficiency. Several types of glazing, absorber surfaces, and paints have been tested to optimize efficiencies while reducing costs (beer cans, for instance, are used in the program's window heaters).

The project is conducted by THA's Woodmont Social Services and is funded by CETA. To date the project has installed 12 of the window collectors, constructed for about $.75/ft^2 from recycled cans and styrofoam with a 6 mil polyethelene glazing. The project is also nearing the completion of two thermosiphon systems for houses without plumbing. Also constructed were an attached passive solar greenhouse, and an unattached, low-cost greenhouse built of PVC pipe and 6 mil plastic. A low-cost air-collector system has been installed on the project's workshop building.

Project director Jim Horton plans to host a solar fair in the Tuscaloosa Housing Project to allow residents and local media to see the solar items, scheduled for installation by December 1979.

Critique/analysis: All homeowners who received the window-heater have requested more units, giving some idea as to the efficiency and desirability of these low-tech, low-cost systems. The



program teaches a marketable skill to the seven CETA workers, and actively disseminates energy information to the local low-income community. This aids interested persons in construction and installation of the systems on their own homes.

Horton stated, "I just had this idea. You hear a lot of talk about solar energy, but I saw nothing being done. We felt like the people who get the information on solar energy are the ones who can afford it, and the ones who aren't getting that information are the ones who need it most."

However, the future of the project is in doubt pending additional funding. Horton would like to see the project expanded to include the sale of the window boxes to non-low-income persons, thus providing continued employment for disadvantaged youth.

Renewable Resources— A National Catalog of Model Projects

Category	Financing
State	AL
Project Name	VA-Approved Solar Loans

Organization	Veterans Administration (VA)
Address	474 S. Court Street Montgomery, AL 36104
Contact	Larry Sellers
Telephone	(205) 262-7781

Funded By	Veterans Administration
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

The VA regional office, through an amendment of the Veterans Housing Benefits Act of 1979, provides for the inclusion of solar water heating, space heating, and space cooling in VA-approved loans.

The systems must meet HUD standards.

Also eligible for loans are residential energy conservation measures. The VA, when appraising property that utilizes solar energy systems, is required to appraise the recognized value of the system.

Based on information from reliable local sources, the VA is also required to adjust the anticipated utility expenses of applicants to reflect the use of solar systems.

Critique/analysis: The Veterans' Housing Benefits Act authorizes the regional administrator to establish a higher rate of interest for such loans and for other improvement loans. Since utilization of solar energy reduces the borrower's utility bills, thus increasing the borrower's ability to repay the loan, it makes very little sense to charge a higher rate of interest. This higher rate of interest discourages solar utilization. Interest rates should be lowered for solar projects to encourage solar installation.

Renewable Resources—A National Catalog of Model Projects

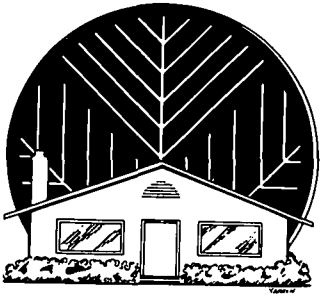
Category	Housing
State	AL
Project Name	Presbyterian Apartments

This 100-unit highrise apartment building for the elderly represents Alabama's first attempt to install a total solar energy system.

Concentrating solar collectors will (if the proposed building materializes) provide heat for hot water, space-heating and cooling, and for generating the building's electric needs.

Project funding has been requested through the HUD-202 Program.

Organization	Presbyterian Apts. Northport, Inc.
Address	1215 East South Blvd. Montgomery, AL 36111
Contact	Mack Freeman
Telephone	(205) 288-3770
Funded By	HUD-202 Project (Requested)
Cost	$600,000
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AL
Project Name	Solar Earth Home

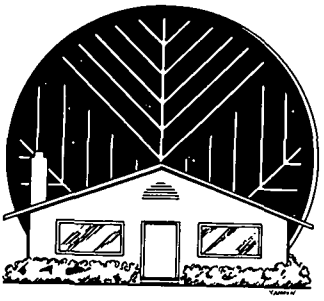
Dr. Hightower has built his dream house, a subterranean residence outfitted with 1,170 ft^2 of solar collectors designed to deliver 100 percent of the building's heating and cooling needs. The system will also provide domestic hot water.

The 9,000 ft^2 house is built into a hill, with its exposed wall facing east. Roof overhangs provide some shading in the summer. The entire house is well-insulated and covered with two feet of dirt.

The collector system heats water when the sun shines, and it is stored in a 20,000-gallon tank buried behind the house. Over the winter the heat is extracted from storage. Another 20,000-gallon tank stores cool water at night and in the winter for summer use.

Critique/analysis: Although the house wasn't put on line until late fall of 1979, the heating system appears to be working well. Dr. Hightower has been reportedly very pleased with the system. While not very practical for the average homebuilder or buyer, the house is a good example of appropriate technology in its incorporation of conservation and renewable energy systems.

Organization	Dr. Peterson Hightower
Address	720 Fourth Avenue York, AL 36925
Contact	Dr. D.P. Hightower
Telephone	(205) 392-5228
Funded By	Private
Cost	
Congressional District	VII
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	AL
Project Name	Solar Sauna

Organization	Dr. Edward Passerini
Address	36L Northwood Lake, Northport, AL 35467
Contact	Dr. Edward Passerini
Telephone	(205) 339-4529

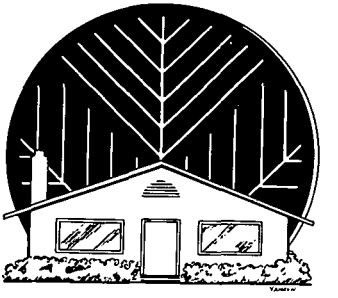
Dr. Passerini has retrofitted a passive solar system to an addition of a partially-constructed summer home located outside of Tuscaloosa. The result is unique. Below a solar roof made of fiberglass and blackened beercans, the doctor has designed an insulated solar sauna room, perhaps the first of its kind ever built.

The system uses a conventional air fan and duct system to circulate the solar-heated air from the roof to a basement bin containing 50 tons of fist-size rocks. An $80 thermosiphoning hot water system is connected to his electric hot water system.

Dr. Passerini estimates that the solar roof and air-duct system are no more than a conventional roof and heating system, respectively.

Critique/analysis: Due to a variety of factors, the house has not been completed yet. When asked when it would be finished, Passerini said, "We'll see."

Funded By	Private
Cost	n/a
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AL
Project Name	Solar Subdivision

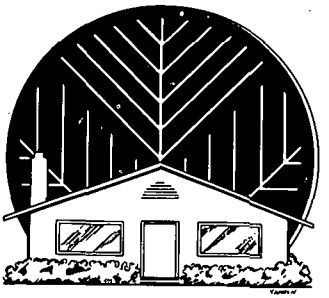
Alabama's first solar subdivision is being constructed by a Huntsville building firm, which has completed nine of the proposed forty-nine homes. All of the homes built in the subdivision will comply with TVA's Super Saver guidelines and will incorporate varying degrees of solar utilization.

The first three homes were built with solar space and water heating systems, as well as passive solar design. The following six homes were built to Super Saver guidelines, passively designed and capable of solar retrofit should the buyer desire.

According to a company spokesman, the cost of the solar home is comparable with conventional houses in the Huntsville area ($38-$41 per square foot). He said that there will be no additional cost to the homeowner because the tax credits (federal) will offset the increase in the down payment. Energy savings will reduce the monthly payments.

Huntsville Utilities will monitor the efficiency of one of the subdivision's houses. It is interesting to note that Huntsville and the solar subdivision are in TVA's service region and have one of the lowest utility rates in the nation.

Organization	Aris Corporation
Address	2611 Clinton Ave., W. Huntsville, AL 35805
Contact	John "Red" Burris
Telephone	(205) 539-1492
Funded By	Private
Cost	Variable, depending upon type of solar system involved.
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AL
Project Name	Thurston Solar Residence

Architect Thurston Sumner has designed passive solar technologies into his residence and office.

The residence is constructed almost entirely of double-glazed glass, and is outfitted with two flat-plate collectors that provide hot water. Five panels provide hot water for a spa.

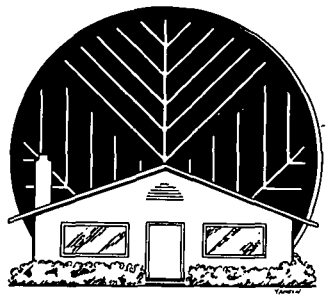
The office is also designed to maximize passive heat gain. Domestic hot water for the office is provided by flat-plate collectors.

Critique/analysis: The only problem is that all homes in Alabama aren't built utilizing passive design features. Mr. Sumner now wishes he'd installed an active solar heating system to assist the passive design aspect.

The two rooms are chilled during the summer through use of attic fans that draw fresh air through the sliding doors.

Organization	Thurston Sumner, A.I.A.
Address	P.O. Box 1397 Columbiana, AL 35051
Contact	Mr. Thurston Sumner
Telephone	(205) 669-4148

Funded By	Private
Cost	n/a
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	AL
Project Name	Solar System Demonstration

Organization	Alabama Space and Rocket Center
Address	Tranquility Base Huntsville, AL 35807
Contact	Mr. Scott Osborn
Telephone	(205) 837-3400

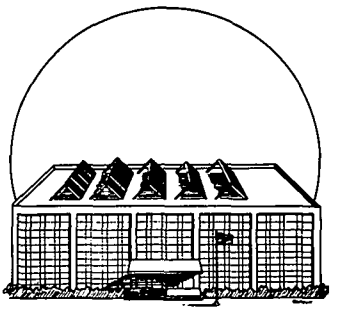
Funded By	Marshall Space Flight Center & Ala. Space & Rocket Center
Cost	$30,000
Congressional District	V
Compilation Date	February 1980

Three hundred thousand persons a year are expected to see the new solar system exhibit installed at the Alabama Space and Rocket Center in Huntsville.

Large numbers of visitors from throughout the nation will be exposed to the potentials of solar energy while visiting the Center.

The highly visible system module is separate from the building it heats. The system is displayed and labeled so that viewers can see energy flow lines from the components of the system. It is extremely well-insulated to minimize heat loss in the structure, the storage, and fluid handling subsystems. A 500 gal. storage system provides space heating requirements for the Lunar Odyssey building. The hot water is used for van and tour bus washing during the non-heating season. The Center is not only one of the nation's largest tourist attractions, but has also been designated a state energy information center.

Critique/analysis: There have been no technical problems with the system. Due to its simple installation, this is one of the most effective solar demonstration projects in the country for public viewing.



Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	AL
Project Name	Wood Heat Rebate

Organization	State of Alabama
Address	State Capitol Montgomery, AL 35130
Contact	Senator Wm. Smith
Telephone	(205) 832-3841

Funded By	State of Alabama
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

At least seven bills addressing solar and conservation issues have been introduced in the state legislature. However, only one has been passed to date: Act 796, which allows residents to deduct the installation costs experienced in converting their home's primary heating source from electricity or gas to wood.

Other pending legislation includes H. B. 489, which would establish a state Department of Energy Resources for the procurement and protection of state energy resources. Another bill, H. B. 490, would require the state to adopt standards for solar energy systems manufactured or sold in the state.

S. B. 102 would exempt solar systems from property tax assessment, and S.B. 339 would allow a 25 percent state income tax credit for solar expenditures ($1,000 max.).

Senate bill 340, calling for a 25 percent (limit $1,000) state tax credit, has had widespread support. At present, attached solar greenhouses remain ineligible for the bill's credits, which otherwise decline five percent annually for accepted projects. Attached greenhouses designed to heat the single residence living space are eligible under the bill. The tax credits would not apply to secondary sources of solar energy, such as wind, hydro, wood or other biomass applications.

Critique/analysis: The main obstacle to passage of solar-related bills is the lack of congressional awareness and the strangle-hold of the legislature by the Alabama Education Association Lobby. Any funds diverted from general state revenues by solar tax credits, etc., would reduce the overall funding for education. S. B. 340 has a good chance of passage due to concentrated and timely citizen support, however.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	AL
Project Name	Alabama Solar Energy Association (ASEA)

Organization	Alabama Solar Energy Association (ASEA)
Address	c/o JEEC-UAH P.O. Box 1247 Huntsville, AL 35807
Contact	Dr. Gerald R. Guinn, Ph.D.
Telephone	(205) 895-6361

Funded By	Annual Dues
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

The goal of the Association is to promote early, successful utilization of solar energy technologies within the region, and to further solar energy through the exchange of ideas and information.

ASEA publishes a quarterly newsletter (The Sun Spot) and a monthly bulletin (Sun-Clispe) for all members. The Association is a chapter of the International Solar Energy Society, American Section (AS/ISES).

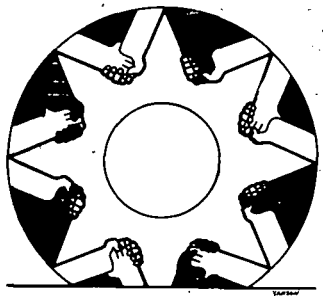
ASEA was founded in 1975 as the North Alabama Solar Energy Association. The current membership is 500, consisting primarily of NASA and Marshall Flight Center employees.

The ASEA has sponsored a series of water and space heating workshops and conducted, in cooperation with the Alabama Solar Energy Center, a short course in solar energy in 1978.

Membership dues are $5.00 (Student $2.50), and corporate dues are $25.00. Full annual membership dues for ISES and the American Section are $40.00, which includes subscription to "Solar Energy Journal", "Sun World Magazine", and ISES & American Section newsletters.

Activities of the Asea are primarily educational and promotional. Several good quality workshops are held yearly on solar heating and cooling. The public is invited.

Critique/analysis: The ASEA, due to its large Huntsville membership, tends to host most all of its workshops and meetings in Huntsville, which isn't centrally located in the state.



Renewable Resources—A National Catalog of Model Projects

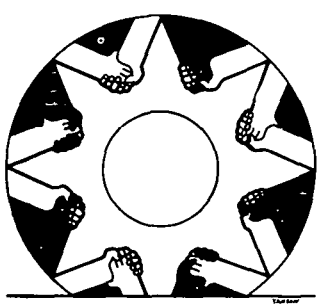
Category	Outreach
State	AL
Project Name	Energy Education Center

The Environmental and Energy Education Center, an energy information clearinghouse, has initiated an energy conservation program for the University of Montevallo. The project has resulted in a reported decrease in energy costs and consumption in the institution.

Included in the Center's program was development of an environmental education course through UM's College of Education. Educational materials have also been distributed in public schools. The Center has obtained films, slide shows, and brochures to supplement its energy presentation to school and civic groups.

Other Center projects have included the development of slide shows on Alabama forests, the Cahaba River, surface mining, and solar energy.

Organization	Environmental & Energy Education Center
Address	Wills Hall, Station 83 University of Montevallo Montevallo, AL 35115
Contact	Lolly Argo
Telephone	(205) 665-2521
Funded By	DOE (1976) University (1977-79)
Cost	$21,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	AL
Project Name	Low-Income Energy Conservation Workshops

Organization	Alabama Energy Extension Service/ Low-Income Project
Address	P.O. Box 222 Alabama A & M University Normal, AL 35762
Contact	Ms. Chinella Henderson
Telephone	(205) 859-7446

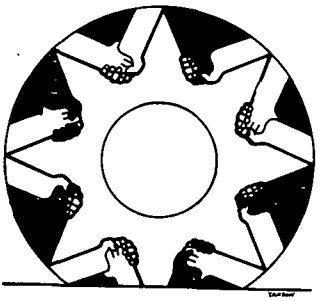
Funded By	Alabama Energy Extension Service/ Energy Management Board
Cost	$72,400 (6 mo. extension of $30,000)
Congressional District	State-wide
Compilation Date	February 1980

This low-income program is designed to provide energy conservation information and services to "model" low-income families, who will then organize energy conservation workshops for their neighbors. It is hoped that through these workshops, the model families will instruct and influence their neighbors to adopt energy conservation techniques.

The program also makes energy conservation information available to low-income persons through the use of fact sheets, monthly newsletters, group lectures, slide shows, the mass media, meetings, and workshops. By means of a home audit, the project provides personalized assistance to the model families. The project hopes to motivate the families to adapt feasible means of minimizing energy loss in the homes through low-cost, recycled materials. These services demonstrate that individuals can live better, and less expensively, saving energy as a consequence.

Critique/analysis: Considering the large number of low-income families, especially in rural Alabama, it appears as though this program doesn't receive the attention or funding it deserves. The project has been extremely creative in its use of recycled and low-cost materials for conservation efforts for the low-income families.

In working with the model families, the program has realized the significance of carefully selecting model families. Families who have already established themselves as community leaders were found to be the most successful in carrying out the duties of a model family. The program is now focusing on families who are well respected and able to influence others in the community.



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	AL
Project Name	Solar Energy Coalition-AL

Organization	Solar Energy Coalition of Alabama
Address	P. O. Box 163 Coaling, AL 35449
Contact	David S. Pate, Executive Director
Telephone	(205) 556-4556

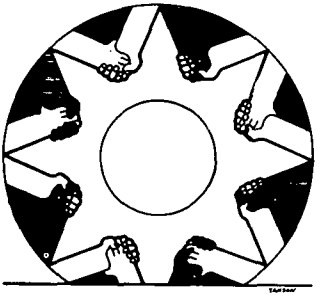
Funded By	Memberships and Grants
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

The Solar Energy Coalition (SEC-AL) was founded in June of 1978 by a broad-based group of individuals concerned with the impact of certain energy systems, and especially nuclear power, on the environment, health and economy of Alabama.

The goals of SEC-AL are to provide an awareness of solar energy in Alabama; to provide current information on solar energy; and to promote utilization of appropriate energy technologies. SEC-AL also works to overcome the barriers blocking rapid development and utilization of appropriate energy sources.

To accomplish the above goals, SEC-AL has established a speaker's bank and solar energy information library, (the latter which will be located in the Alabama Conservancy's Red Mountain Museum in Birmingham). It also publishes a monthly informational newsletter to over 2,000 members and interested persons, and sponsors workshops on energy self-sufficiency, appropriate technology, greenhouse design and construction, and composting toilets. SEC-AL cooperates with other groups and state agencies, etc., to promote the transition from conventional to renewable energies in Alabama. SEC-AL has approximately 100 members.

Critique/analysis: The Coalition is accomplishing its goals, and is building an effective grassroots network in the process. The main barrier lies in lack of funding.



Renewable Resources— A National Catalog of Model Projects

Category	State
State	AL
Project Name	Alabama Energy Extension Service
Organization	Alabama Energy Extension Service (AEES)
Address	313 Ross Hall, Auburn University Auburn, AL 36830
Contact	D. F. Dyer, Director
Telephone	(800) 392-8098
Funded By	Alabama Energy Management Board (AEMB)
Cost	$1,038,918
Congressional District	State-wide
Compilation Date	February 1980

In October of 1977, Alabama was awarded a grant to establish a pilot Energy Extension Service Program, one of ten such programs in the country. Since then, the Alabama Energy Extension Service (AEES) has served to develop ways of informing state residents about energy conservation and new technology.

Administered by the Alabama Energy Management Board and managed by Auburn University, the AEES program addresses seven energy consumer groups through the following activities: a boiler/water heater efficiency program, a residential fuel-efficiency project, a fuel substitution utilization program, and car care clinics. AEES also investigates energy systems for low-income groups, and energy efficiency in agricultural applications.

Among the project's goals is the reduction by ten percent of the energy consumption of 400 municipal and 420,000 commercial and industrial water heater systems. AEES also offers energy seminars and educational resource services to state residents.

AEES' residential fuel-efficiency program, its fuel substitution/utilization program, and low-income energy systems research are detailed in separate project descriptions.

Critique/analysis: As is true of any pilot program, there is room for improvement in the [illegible]. However, the overall results and performance of the seven programs has been exceptional, and has had more impact and subsequent energy savings than other programs.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	AEES Efficient Use of Energy in Agriculture
Organization	Alabama Energy Extension Service (AEES)
Address	Alabama Cooperative Ext. Service (ACES) Auburn University Auburn, AL 36830
Contact	Dr. Charles B. Ogburn
Telephone	(205) 826-4955
Funded By	AEMB/AEES
Cost	$202,681
Congressional District	State-wide
Compilation Date	February 1980

Through this program, the AEES seeks to inform Alabama farmers on technologies and techniques for reducing energy demands and increasing production efficiency. The information is disseminated via radio broadcasts, news releases, TV and slide productions, and printed materials.

The project has also sponsored agricultural energy fairs, workshops and seminars. The project has emphasized the following areas of high energy saving/alternative energy utilization: broiler production facilities, heating and cooling systems used in dairy/swine operations, tillage techniques, grain drying systems, and uses of chemicals and fertilizers.

Solar demonstration projects have highlighted the project's outreach efforts, and in most cases have demonstrated economic and technical feasibility for agricultural applications. A swine farrowing demonstration project was installed on a Jackson County farm using solar heated water to heat the slab floor under the farrowing pens. Another swine farrowing demonstration has been installed on the ACES Demonstration Farm in Colbert County.

A solar water heating system was installed in a dairy operation in Hale County that is tied into a heat exchanger in the milk cooling system.

Critique/analysis: This is the only solar-oriented project to evolve from the AEES, and it has been exceptionally successful in demonstrating fram applications of solar energy. The project director is very enthusiastic about solar potential on the farm.

Workshops on solar energy utilization, alcohol production and utilization have heightened farmer interest in Alabama on alternative energy sources and conservation technologies.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	AEES Fuel Substitution Utilization Program
Organization	Alabama Energy Extension Service (AEES)
Address	305 Ross Hall Auburn University Auburn, AL 36830
Contact	A. R. Tarrer, Project Director
Telephone	(205) 826-4827
Funded By	AEES Ala. Energy Mgt. Bd. DOE
Cost	$151,070
Congressional District	State-wide
Compilation Date	February 1980

The pilot AEES Fuel Substitution/Utilization Program (FS/U) has explored methods of reaching Alabama residents with personalized help on energy conservation and the use of new technology. FS/U services provide seminars and workshops on alternative energy, prepare and distribute technical information on renewable energy sources, and perform technical and economic assessments for clients on various alternative energy systems.

Technologies considered include waste material utilization, waste heat recovery, energy conservation, solar energy, cogeneration, and production of alternative fuels such as ethanol and methane.

Faculty and staff at Auburn University's Department of Chemical Engineering provide the expertise necessary to orient the program with the commercial/industrial sector. Industry consumes 37 percent of all energy used in Alabama, while the commercial sector uses another 13 percent. Laboratory and design facilities are available to be used in evaluating alternatives for clients. Although no attempt is made to provide detailed engineering, the groundwork is laid for a client to implement an alternative energy system.

Critique/analysis: Lack of business and industry response has precluded success of this project. However, the groundwork has been laid for future implementation.

Renewable Resources— A National Catalog of Model Projects

Category	State
State	AL
Project Name	AEES Residential Energy Conservation Service
Organization	Alabama Energy Extension Service (AEES)
Address	P.O. Box 6282 University of Alabama University, Alabama 35486
Contact	Dr. C. Everett Brett
Telephone	(205) 348-4523 1-800-452-5901
Funded By	AEES-AEMB
Cost	$131,988
Congressional District	State-wide
Compilation Date	February 1980

The AEES Residential Energy Conservation Service Project attempts to help Alabama citizens reduce their energy bills through efficient home heating equipment and alternative sources of energy.

The service offers three types of assistance to Alabamians including a state-wide toll-free "hotline" that has averaged 10.7 calls per day since its inception.

An AEES speaker bank is available to any group or organization interested in home energy conservation and money-saving information. Printed material is available upon request. Information packets include material on fireplaces, central wood furnaces, heat pumps, high efficiency furnaces, etc. Packets are prepared for special needs, and the Service also provides information on woodburning safety.

The AEES project was one of ten nationwide pilot programs for energy information and has had tremendous response by mail and a toll-free hotline. The Service in its first year presented 56 speeches to various groups, made ten media appearances, and conducted twelve conferences, exhibits, and seminars.

Callers describe the "hotline" as convenient, personal, immediate, and unbiased.

C ue/analysis: While the project does an e lent job educating Alabamians on wood and conventional heating systems, it is ill-prepared to offer information on solar and renewable heating and cooling systems. DOE brochures are included in information requests on solar. This project has been one of the more successful sponsored by the AEES.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	Alabama Solar Energy Center
Organization	Alabama Solar Energy Center
Address	P.O. Box 1247 UAH Huntsville, AL 35807
Contact	Dr. Gerald R. Guinn
Telephone	(205) 895-6361 (800) 572-7226
Funded By	State Educational Trust Fund
Cost	$23,000 Solar System Test Project
Congressional District	V
Compilation Date	February 1980

The Alabama Solar Energy Center (ASEC) was founded in 1977 as an outgrowth of the Kenneth E. Johnson Environment and Energy Center. The ASEC's goals are to promote the use of solar energy and the development of the solar energy industry in Alabama.

Located at the University of Alabama, Huntsville campus, ASEC activities include legislative support, research and testing, and programs in education and technical assistance. ASEC also compiles directories and solar radiation data, and develops strategies for the TVA Solar Water Heating Demonstration.

Specific projects include a solar water-heating display, passive solar greenhouses, and other exhibits and outreach presentations.

The solar water-heating display consists of six water heaters currently marketed in northern Alabama (oil, antifreeze, and draindown systems). The systems were installed on a typical roof structure and sized to the needs of a three-member household. A timer and can device are used to operate a dump valve, thereby simulating actual consumption patterns of an average family. Systems are monitored with a BTU meter and two kilowatt meters to determine solar savings. A conventional electric water heater was installed for purposes of comparison.

Performance and operational data are analyzed monthly and reported through various public information channels. Auxiliary power usage, energy output, cold and hot water supply temperatures, tank temperatures, water usage and solar insolation are among the data categories.

ASEC constructed a simplified solar greenhouse on campus to demonstrate the technology's

heat generation capacities. Interest in the
lar systems demonstration project and the
lar greenhouse has been reportedly great.

ASEC also offers an energy telephone hotline to meet a growing demand for knowledge of domestic solar energy applications.

Critique/analysis: The passive greenhouse project was implemented to provide homeowners with a low cost, simple construction technology with a 15-20 year lifespan. ASEC has received over 400 information requests since the project began.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	Energy Conservation and Management

Organization	Alabama Energy Management Board (AEMB)
Address	3734 Atlanta Highway Montgomery, AL 36130
Contact	Ed Hudspeth
Telephone	(205) 832-5010

Funded By	Department of Energy
Cost	$4,000,000
Congressional District	State-wide
Compilation Date	February 1980

The Alabama Energy Management Board (AEMB) is the state's energy watch dog charged with development and implementation of the State Energy Conservation Plan.

The AEMB sponsors the Alabama Energy Extension Service, and develops thermal efficiency standards for new renovated buildings, and lighting efficiency standards for public buildings. It also organizes programs in vanpooling, mass transit, state and local government energy management, and commercial and industrial energy conservation.

All state energy related activities are directed from the AEMB which is the disbursing mechanism for DOE funds in the state. AEMB activities deal with energy conservation technologies, and development of fossil fuel reserves in the state.

Critique/analysis: The AEMB reportedly concentrates heavily in development of non-renewables, and has lost interest in the development of renewable energy technologies. While conservation efforts have been substantial, the lack of advocacy for solar energy has generated distrust and criticism among the public interest/appropriate technology advocates in Alabama. Also prevalent in AEMB-funded activities is the almost exclusive use of university and state agencies for implementing programs.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	Johnson Energy and Environmental Center (JEEC)
Organization	Kenneth E. Johnson Environmental and Energy Center
Address	University of Alabama Huntsville P.O. Box 1247 Huntsville, AL 35807
Contact	David L. Christensen
Telephone	(205) 895-6257
Funded By	State
Cost	n/a
Congressional District	V
Compilation Date	February 1980

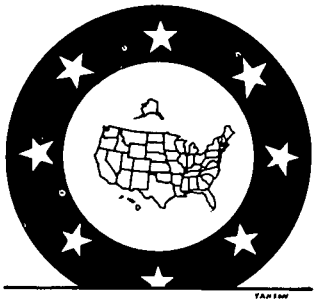
The Kenneth E. Johnson Environmental and Energy Center (JEEC) was established by the state in 1971 to address environmental problems in Alabama. Since then its role has expanded to include energy problems.

The JEEC operates out of the University of Alabama campus in Huntsville (UAH). Its activities include operation of the Alabama Solar Energy Center, the State Climate Office, the Certified Test Facility (for wind and solar systems), and an auto safety center. JEEC also oversees an Electric Vehicle Evaluation program for the TVA, and runs extensive laboratories for environmental studies. The Center has an extensive collection of solar/alternative energy documents.

JEEC has conducted studies and workshops on the socio-economic aspects of the federal Biomass Alcohol Fuels Programs. It also has researched and tested solar-related technologies. including the Solar Energy Heating Module Program and the state solar radiation data base development project.

Project Conserve, another JEEC program, served to establish state energy conservation recommendations on the basis of 300,000 questionnaires mailed to TVA and Alabama Power Company customers.

que/analysis: JEEC has been very important in solar education, research and development in Alabama. The ASEC has been particularly instrumental in advocating the solar transition.



Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	Office of Energy & Environmental Policy

The Energy & Environmental Policy Office was established to research energy impacts on the environment through state and national grants. It is a public service effort aimed at state and local government rapport, concerning problem solving in energy-related fields. The secondary goal is to increase community energy awareness information.

Critique/analysis: The main fault of the Office of E & E Policy is the lack of funding.

Organization	Office of Energy & Environmental Policy
Address	Drawer I University of Alabama University, Alabama 35486
Contact	Dr. Clyde Keesler
Telephone	(205) 348-5980
Funded By	U. of Alabama, School of Mines
Cost	$30,000 Salary
Congressional District	State-wide
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AL
Project Name	Project R.O.S.E.

Organization	Project R.O.S.E.
Address	Box G University, AL 35486
Contact	Renee Paudler, Project Manager
Telephone	(800) 392-8098

Funded By	Alabama Energy Management Board
Cost	$41,000
Congressional District	I & VII
Compilation Date	February 1980

Project R.O.S.E. (Recycled Oil Saves Energy), funded by the Alabama Energy Management Board, is designed to reclaim some six million gallons of used oil dumped in the state each year.

Project R.O.S.E. is encouraging each local and county government to establish a plan for their area that will solve the dumping problem. The project first conducted surveys to determine consumer and service station attitudes toward participation in the plan. With a favorable survey response, the organization initiated two pilot projects.

Tuscaloosa has curbside pickup for used oil. About 52,000 gallons of used oil were gathered in the first nine months of the Tuscaloosa program.

Mobile, which has 21 collection stations, has collected over 80,000 gallons since March of 1979. Birmingham has also begun collection, and Selma, Decatur, Muscle Shoals, and Huntsville plan to follow suit.

Project R.O.S.E. expects to collect one-third of the six million gallons of reclaimed oil used in Alabama yearly. This would provide the energy equivalent of 11,666 gasoline fillups, or would power 7,000 one-ton air conditioners for one year.

Most oil dumping occurs because some service stations or individuals do not collect the oil they change from automobiles. Used oil is a hazardous waste because it contains metal contaminants (primarily lead). Oil is also tremendously polluting to water systems, and can change the taste and odor (not to mention the purity) of drinking water.

Publicity is ongoing, and Project R.O.S.E. literature is being sent to the media in all regions of the state.

Service station managers are encouraged to volunteer their stations for collection of the oil from citizens.

Project R.O.S.E. is also studying the feasibility of utilizing wood waste for heat generation in Alabama. The used oil and wood-waste recycling projects were developed by Dr. Gary C. April of the Mineral Resources Institute at the University of Alabama.

Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	AL
Project Name	Alabama Power Co. Solar Demonstration

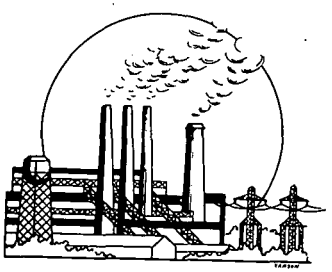
This solar demonstration project provides heating (60 percent), cooling (18 percent), and domestic hot water for the Alabama Power Company District Office in Montevallo using 2,340 ft^2 of flat-plate collectors. A visitors center displays schematic diagrams of the system, supplemented by instrument readouts that demonstrate the system's performance. Over 3,000 visitors have toured the demonstration center.

The office building features conservation design, including window overhangs to block summer sun. It is interesting to note that because of the overhangs the peak cooling requirement occurs in December, due to the lower sun angle.

Since the project is actually a "research" demonstration, there hasn't been a payback projection. The project is monitored with 90 different sensors, which are read by a computer every five minutes. An additional $29,000 grant was obtained from the Electric Power Research Institute, DOE, and Alabama Power for control modifications.

Critique/analysis: The demonstration system in Montevallo caught fire when the plexiglass reflectors concentrated sunlight on the reflective covering of the lower set of reflectors. The system, which became operation- ·1 in July of 1978, has been reportedly shut ı since early 1979. Other problems reportedly lude control design complications, a system freeze-up and initial oversizing of the hot water storage tank in the cooling mode.

Organization	Alabama Power Company
Address	116 N. Main Street Montevallo, AL 35115
Contact	Ms. Pam Pack, Solar Coordinator
Telephone	(205) 665-1221
Funded By	DOE, Electric Power Research Institute, Alabama Power Co.
Cost	$494,000
Congressional District	VII
Compilation Date	February 1980



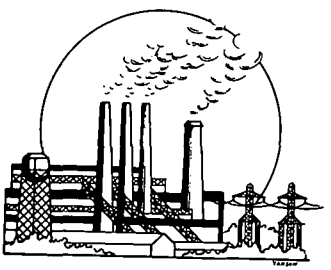
Renewable Resources— A National Catalog of Model Projects

Category	Utility
State	AL
Project Name	TVA Energy Conservation Programs
Organization	Tennessee Valley Authority (TVA)
Address	Energy Conservation Branch Power Service Center 3 Chattanooga, TN 37401
Contact	Noel Walker or Rebekah Stulce
Telephone	(615) 755-3651
Funded By	TVA
Cost	FY 79 $2,100,000 FY 80 $7,500,000 FY 81 $9,400,000
Congressional District	V
Compilation Date	February 1980

TVA is promoting energy conservation through its home insulation, waste heat utilization and the Super Saver Home programs. Through the Super Saver Home program, TVA encourages construction of super-efficient homes that utilize proven conservation techniques. TVA works directly with the home-builders and building associations to inform the consumers of the benefits of their Super Saver Program. Each Super Saver residence averages 65-67 percent less in heating and 25-35 percent less in cooling needs than the typical home. Building costs run about 50¢ more per sq. ft. than a conventional home. But the payback is about 2½ years. Approximately 500 Super Savers have been built in Alabama, saving an estimated five million kilowatt hours for their owners.

TVA's Home Insulation Program to date has made 67,843 interest-free loans for home insulation, saving customers an estimated annual 170.2 million KWH. TVA also has a heat pump financing plan which has made 90 loans so far in Alabama.

TVA's other main thrust in energy conservation has been in waste heat utilization. Over 65 percent of the thermal energy produced in an electric generating plant is lost to the atmosphere. TVA is examining methods of utilizing this lost energy. In the Browns Ferry Greenhouse Project, waste heat from the local nuclear reactors provides a controlled-environment greenhouse, thereby using some of the normally rejected waste heat. Other uses for waste heat include environmental control for livestock housing, soil heating and irrigation, reclamation of nutrients from livestock manures, crop drying and aquaculture. The ultimate goal of the program is to stimulate widespread commercial use of waste heat. Implementation of waste heat technology is expected to help conserve natural energy resources and improve overall energy use efficiency of electric power plants.



Critique/analysis: All conservation projects implemented by TVA are considered economically justified, primarily because it will eliminate the necessity for new plant construction.

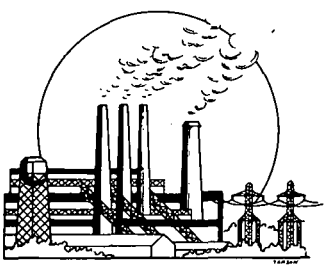
Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	AL
Project Name	TVA Solar Agriculture Program
Organization	Tennessee Valley Authority (TVA)
Address	National Fertilizer Development Center Muscle Shoals, AL 35660
Contact	Robert S. Pile
Telephone	(205) 386-2866
Funded By	TVA
Cost	n/a
Congressional District	V
Compilation Date	February 1980

TVA's Agricultural Energy Applications Section has prepared an assessment of potential agricultural production applications of solar energy within the TVA power service area. This assessment will be used in the development of an overall TVA solar strategy.

Uses addressed include crop drying, heating livestock facilities and greenhouses, and the use of livestock wastes or crop residues for energy. Production systems offering the greatest near-term potential would provide low-temperature heat for grain drying, heat for broiler and swine farrowing facilities, and hot water for dairies. To this end, TVA has initiated broiler house and swine farrowing projects in cooperation with Auburn University's Agricultural Engineering Department.

TVA also operates a pilot research and demonstration facility for biological recycling to evaluate the use of solar and methane (fuel) applications and to assess certain potential uses on the farm and/or power sites. Power plant and farm demonstrations are planned for 1980.



ARKANSAS

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2. Blytheville
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16. Marianna
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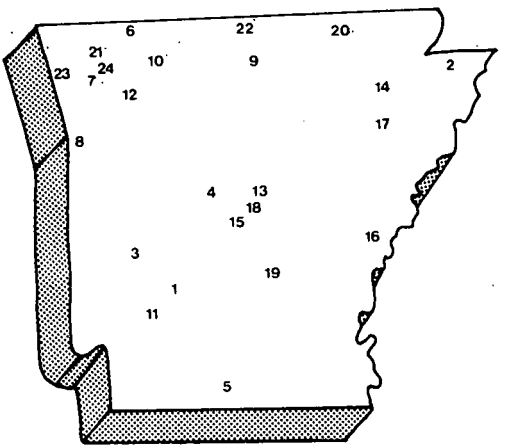

ARKANSAS

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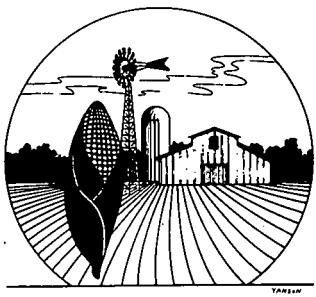
Renewable Resources— A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Big D. & W. Refining & Solvents Co., Inc.

Mr. White and Mr. Dooley are constructing an alcohol fuels plant (for gasohol) in the Van Buren Industrial Park. They intend to use renewable feedstock for production of the alcohol and expect completion by the end of November of 1979.

Organization	Big D.&W. Refining & Solvents Co., Inc. Farm Co-op
Address	21 North Second St., Fort Smith, AR 72901
Contact	Jack White E. G. Dooley
Telephone	(501) 474-8051 (501) 783-4141
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

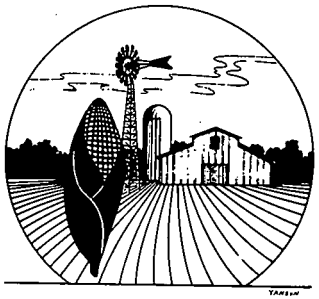
Category	Agricultural
State	AR
Project Name	Energy Process Corporation

Energy Process Corporation, founded in January of 1979, under the name Synerco, has built an alcohol fuel plant that is totally self-sufficient and reportedly ecologically sound. Besides alcohol, the plant produces both a liquid and dry fertilizer with a 30 percent nitrogen content.

The alcohol is extracted from cellulose food waste through an acid treatment system and regular distillation process. Methane gas is produced from slaughtered animal waste and poultry manure, and provides the power for the process. Solar heat is used to supplement the methane gas and the fertilizer drying process. All water used in each process is recycled.

Depending on the feedstock used, a 5 million gallon-a-year plant will market alcohol at a cost of $0.35/gallon and up (with a maximum production cost of $0.25/gallon).

Organization	Energy Process Corporation
Address	423 North University Little Rock, AR 72207
Contact	Ralph Watts Garren Hagemeir
Telephone	(501) 666-0128
Funded By	Economic Development Admin. - Loan through Ozark Reg. Develop. Comm.
Cost	n/a
Congressional District	II
Compilation Date	February 1980



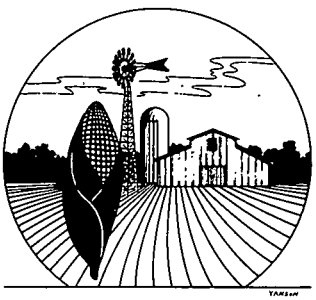
Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Methane from Cow Slurry

James Keel has designed a methane gas biomass converter, using variations of existing designs from India, South Africa and Europe, to convert cow manure to methane gas. The design uses a horizontal tank, set in the ground for insulation, with a daily feeding in and withdrawal of slurry. He will produce electricity from a generator powered by the methane. A second product will be an ecologically sound, highly effective fertilizer made from the waste slurry.

Organization	James Keel
Address	P.O. Box 763 Harrison, AR 72601
Contact	James Keel
Telephone	(501) 741-6067

Funded By	Federal Appropriate Technology Small Grants Program (DOE)
Cost	$7,695
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Methane Generator Plant

John Van Geldern has a contract pending for a 50,000 bird-poultry farm methane-generation plant. Using poultry waste, the plant will produce 12,000 cubic feet of methane gas per day, generating all of the farm's electricity needs. The process will be discharged free; everything will be recycled and utilized.

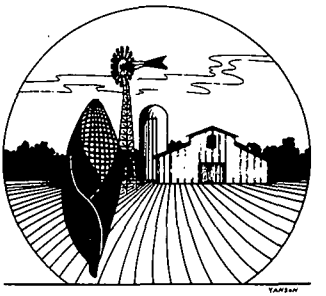
A second product from the plant will be a solar-pasteurized, high protein animal feed.

Van Geldern also plans to build a methane generator for a small fuel alcohol distillery. Methane gas will be extracted from the slurry that is left after the alcohol is distilled. The methane-powered generator will then provide heat and electricity for the distillation process, cutting the price of the alcohol as a result.

Van Gelder, who has constructed several methane production plants in the Far East and has conducted research in the field for many years, has written a do-it-yourself booklet entitled Farm Waste Recycling For Methane Fuel.

The Arkansas Department of Energy is adapting the booklet for Arkansas farmers, with the intention of publication and free distribution.

Organization	Biotech Engineering, Inc.
Address	214 S. Spruce St. Hope, AR 71801
Contact	John Van Geldern
Telephone	(501) 777-9057
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Solar Poultry House

The Ozarks Regional Commission has funded the construction of a solar-heated poultry house as the result of a study conducted in 1976 at the University of Arkansas. Birds and feed used in the operation were provided by the Arkansas Poultry Federation.

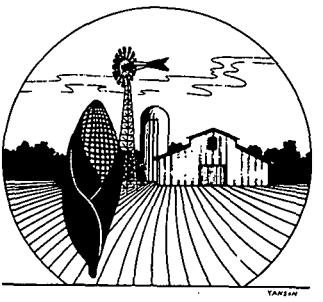
The 8,000-bird broiler house has an independent 182m^2 flat plate collector. A 180-ton rock storage system supplies heated ventilating air to the house.

A fuel savings of 66 percent compared to conventional houses was shown in the 1978-79 winter season. Growth and conversion were better than average.

Since the system began in August of 1977, 10 batches of 8,000 chicks each have been grown to market weight with the help of solar heating.

Organization	University of Arkansas, Dept. of Agricultural Engr.
Address	University of Arkansas, Fayetteville, AR 72701
Contact	Thomas Rokeby
Telephone	n/a

Funded By	Ozarks Regional Commission, Arkansas Poultry Federation
Cost	n/a
Congressional District	III
Compilation Date	February 1980



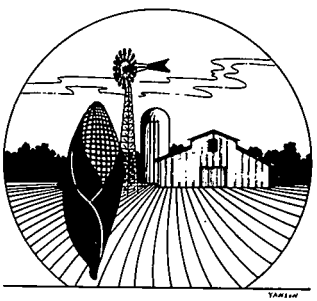
Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Solar Rice Drying

The University of Arkansas Engineering Science Department has received a one-year grant to develop a solar rice drying technique. Dr. Gilbrech says that the concept involves the use of concentrating collectors that will heat glass beads, which in turn will dry the rice.

Dr. Gilbrech teaches a fundamentals of solar energy class, primarily addressing the heating and cooling of buildings.

Organization	Engineering Science Department
Address	University of AR Fayetteville, AR 72701
Contact	Donald Gilbrech
Telephone	(501) 575-3054
Funded By	DOE
Cost	$20,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

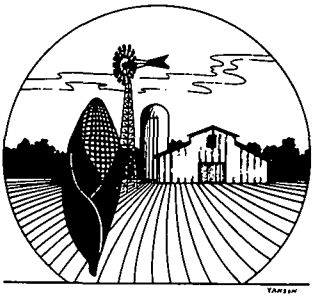
Category	Agricultural
State	AR
Project Name	Solar Wood-Drying Kiln

Tom Bangert, a loom-maker by trade, intends to research and construct a solar wood-drying kiln he has designed. The small structure would be appropriate for crafts persons, homesteaders, and others who have a need for drying the wood they use.

The technology collects the sun's heat using the greenhouse principle.

Bangert, a member of a wood-working cooperative in Eureka Springs, plans to build the kiln himself with the assistance of one other worker.

Organization	Tom Bangert
Address	P.O. Box 464, Eureka Springs, AR 72632
Contact	Tom Bangert
Telephone	(501) 253-7149
Funded By	Federal Appropriate Technology Small Grants Program
Cost	$6,274
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	AR
Project Name	Wood-heated Chicken Coop

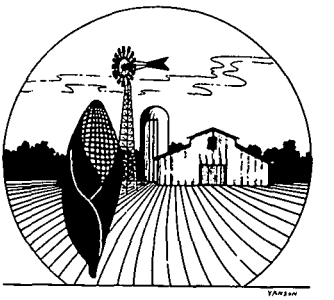
An Arkansas corporation that manufactures woodburning stoves and fireplaces has conducted a series of tests at the University of Arkansas to see if woodburning stoves can provide an effective alternative to propane for heating commercial chicken houses.

Conducted in Hattiesburg, Mississippi, during January and February 1979, 18,000 baby chicks were placed in each of two identical 12,000 ft^2 chicken houses. One was heated with propane, the other with wood.

The first house used 962 gallons of propane during the 1½ month period, while the second house used 2¼ cords of wood, donated by the farmer, in the three wood burning stoves.

The average weight of the chickens in the house heated by wood exceeded that of the chickens in the propane heated house by .21 lbs. per chicken, with only a slight decline in the percentage of livability. Mr. Jordan attributed this higher weight to the cleaner burning of wood over propane.

Organization	Fisher Stove Div. Jordan Eneterprises, Inc.
Address	P.O. Box 916 North Little Rock, AR 72115
Contact	John T. Jordan
Telephone	(501) 771-1717
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

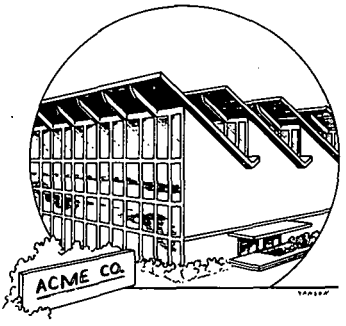


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	AR
Project Name	Solar Bank

Completed early in the summer of 1979, the White Hall Branch of First Federal Savings and Loan Association has a totally automatic solar heating and cooling unit comprising 24 roof collectors. The system will provide an estimated 40 percent of the cooling and 55-60 percent of the heating.

Organization	First Federal Savings & Loan Association
Address	8107 Dollarway Rd., Pine Bluff, AR 71602
Contact	Dwayne Johnson
Telephone	(501) 247-5288
Funded By	n/a
Cost	$30,000
Congressional District	IV
Compilation Date	February 1980

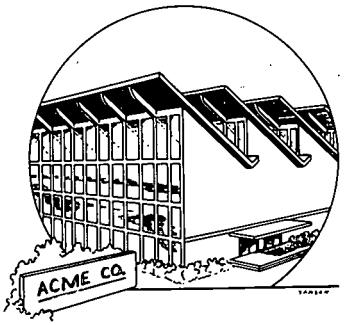


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	AR
Project Name	McDonald's Hamburgers

The McDonald's Restaurant in Springdale has 14 solar collectors on its roof that provide hot water heating. The system was installed in 1977.

Organization	McDonald's Hamburgers
Address	518 S. Thompson, Springdale, AR 72764
Contact	n/a
Telephone	(501) 751-1070
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	AR
Project Name	Waste Disposal/ Energy Recovery

Three cities in Arkansas have solid waste disposal/energy recovery plants in operation, with one under construction and one in the negotiating stage.

These include Siloam Springs, which has a 20-ton per day capacity plant, the first of its kind in this country. Blytheville has a 50-ton per day capacity plant. North Little Rock has a 100-ton per day capacity plant.

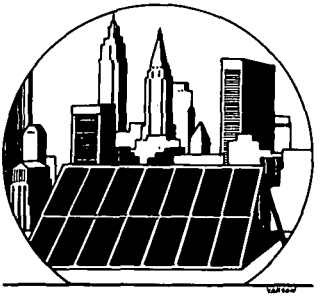
Osceola, AR is working on a 50-ton per day plant and Batesville is negotiating on a 50-ton per day plant.

The Mayor of Osceola has also arranged with the Department of Energy, and others to use the city's new facility for testing coal-lignite-solid waste feasibility from both ecological and conservation standpoints. For a period of five days they will try burning the three fuels separately and in combinations, to come up with an energy operation that could produce two to three megawatts in a small scale controlled air combustion system.

The Ozark Regional Commission has awarded $40,000 to the Arkansas 2000 Corporation to perform this study. As primary contractor, Arkansas 2000 Corporation plans to sub-contract the operation and coordination of the actual test.

During the five-day period the usual municipal waste processing will go on as normal. A pretest will be conducted, and special consultants will be hired. The entire effort will include coordination with State and Federal agencies.

Organization	Arkansas Department of Energy
Address	3000 Kavanaugh, Little Rock, AR 72205
Contact	Al Drinkwater Stanley Fletcher
Telephone	(501) 371-1370 (501) 563-5102
Funded By	Municipal Revenue Bonds
Cost	$1.5 million/100-ton per day
Congressional District	II
Compilation Date	February 1980



The plants are paid for by the cities through a 20 year bond program. The plants are modular air incineration and energy recovery systems that meet pollution standards without the use of scrubbers or precipitators, and deliver a higher BTU efficiency than systems with scrubbers. Not only are they a source of energy, they also provide a cheaper method of municipal and industrial waste disposal.

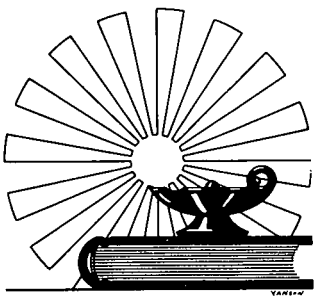
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AR
Project Name	Arkansas E^4

The Arkansas Advisory Council for Environmental Education is working to develop a comprehensive state plan in environmental education. The plan is entitled Arkansas E^4, and will encompass the areas of energy, ecology, economics and engineering (technology).

One of the lead components of this plan will be energy education. The Arkansas Department of Education and Arkansas Department of Energy are working to produce a K-12 energy curriculum for the state's schools.

Organization	Arkansas Department of Education
Address	Arch Ford Bldg., Capitol Mall, Little Rock, AR 72201
Contact	Bill Fulton
Telephone	(501) 371-2791
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AR
Project Name	Biomass Research Center

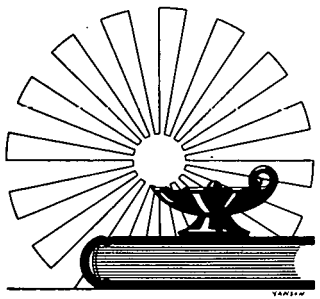
Gulf Oil Corporation donated a laboratory and several patents in August of 1979 to the University of Arkansas Foundation, Inc. for an energy research center. The laboratory of the new Biomass Research Center is operating on the campus, and there are plans for a 12,000 ft^2 building to accomodate the program.

The principal center product will be ethyl alcohol made from cellulose materials derived from municipal and industrial wastes. The process by which the alcohol is distilled is completed in about 24 hours. Although still in the pilot plant stage, the process has been demonstrated as being practical.

The system contains no high-pressure processes, and the temperature rises only to the level needed to vaporize the alcohol. A plant could be constructed with off-the-shelf industrial components.

The Center has designs for plants with a capacity of 1,000 tons or 2,000 tons of feedstock (waste) a day. Each ton produces 80-100 gallons of ethyl alcohol. The process reportedly extracts 81 percent of the potential energy (Btu's) from the waste. The residue left from the process can be dried and used as fuel for the furnace under the still.

Organization	University of ... Foundation, Inc.
Address	Univ. of AR, Admin. Bldg., Fayetteville, AR 72701
Contact	Dr. George H. Emert
Telephone	(501) 575-2654
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

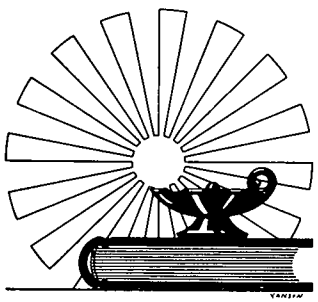
Category	Education
State	AR
Project Name	Delta Voc-Tech. Sch.

The Delta Voc-Tech School receives a Federal Exemplary Program Grant through the State Board of Vocational Education for a project entitled "Curriculum Development for Solar Energy Application". It is a two-and-one-half year program ending February of 1982 which currently has eight students.

The first year is devoted to designing a solar hot water system and developing the curriculum for teaching its technology. The system will have a single-axis (north-south) seasonal tracking collector plate. This has already been successfully demonstrated, but is still being developed. The second year will be for developing the design and curriculum for space heating and cooling system with a dual-axis tracking collector (north-south, east-west). The last half year will focus on compiling information on power generation.

It is part of a research and development project of the Vocational Industrial Clubs of America (VICA), and Enertek Energy Engineering of Truman, AR is also involved.

Organization	Delta Vocational Technical School
Address	P.O. Box 279 Marked Tree, AR 72364
Contact	Robert Watson, Jr.
Telephone	(501) 358-2117
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

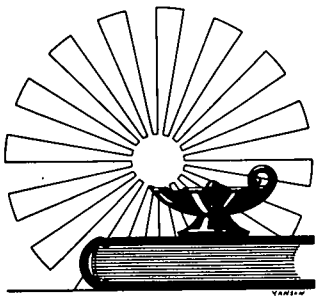
Category	Education
State	AR
Project Name	Homestead Village

David and Will Orr are planning and building Meadowcreek Project, Inc., an environmental educational institution and energy "think tank," where they will utilize and exhibit all kinds of renewable energy. This five year project will be located on 1500 acres in Fox owned by the brothers, and others.

In July they began the first building - an experimental prototype - which will be 100 percent solar powered and will serve as an office and guest structure. In five years, they plan to have several buildings utilizing solar and renewable energies in a variety of ways.

Their advisory board is made up of such noted energy experts as Amory Lovins and Arkansas Governor Bill Clinton. They hope to operate on a non-profit basis with a staff which will probably not exceed 50 persons.

Organization	Meadowcreek Project, Inc.
Address	General Delivery, Fox, AR 72051
Contact	David Orr
Telephone	(501) 363-4348
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

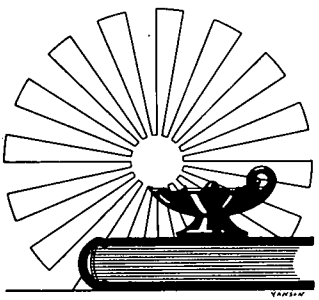


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AR
Project Name	John Brown Univ.

John Brown University has a one year grant to retrofit its engineering building for solar space heating using roof-type solar collectors. Student studies will include the actual construction and installation of the solar equipment. A solar technology instructional program will continue after the grant period has ended.

Organization	John Brown University
Address	Siloam Springs, AR 72761
Contact	Dr. James Pearson
Telephone	(501) 524-3131
Funded By	DOE
Cost	$38,690
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AR
Project Name	Northwest Arkansas Economic Development District

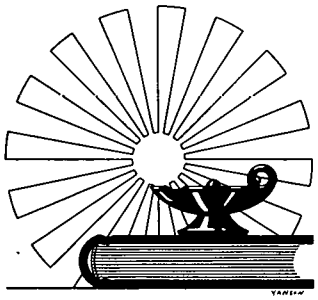
The NW Arkansas Economic Development District is operating a CETA Youth Employment Training Program that provides solar workshops for young people -- primarily high school dropouts. The youth are trained in building and installing solar water heaters and wall collectors for solar space heating.

The systems are installed, free of charge, on houses of low-income persons who qualify for weatherization in a nine-county area in Northwest Arkansas.

Besides providing low income persons with water and air heat, the program teaches the youth skills in basic carpentry and plumbing, and enables them to build solar water heaters and wall collectors as a trade.

Mr. West hopes that the program will encourage students to set up permanent shops where they can sell the solar equipment they build.

Organization	Northwest Arka... Economic Development District
Address	Box 190, Harrison, AR 72601
Contact	Al West
Telephone	(501) 741-9431
Funded By	CETA
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	AR
Project Name	Solar Water Heating Workshops

The Industrial Education Department at U.C.A. has held two, non-credit, public solar workshops for contractors and installers in the last two years taught by Dr. Jordan of U.C.A. Funded by the Vocational Education Division of the State Department of Education, there were demonstrations of various solar equipment, and simple solar collectors were built.

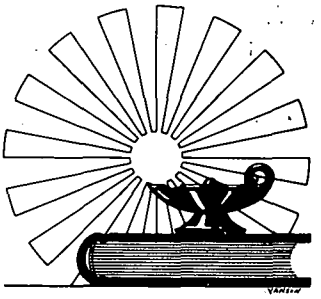
Two collectors built by workshop students, a forty gallon thermosyphoning water heater, and an air collector with heat exchanger for water heating, are used in the Industrial Education Building for teaching purposes.

This year, the contents and plans for a credited solar workshop are being made. They hope to hold it in January or February for vocational teachers.

An interdisciplinary course on energy (including solar) is being planned for the 1980 spring semester curriculum. They also hope to have a non-credit energy course for the public in the spring semester.

Organization	University of Central Arkansas
Address	Conway, AR 72032
Contact	Vincent J. Feck
Telephone	(501) 329-2931

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



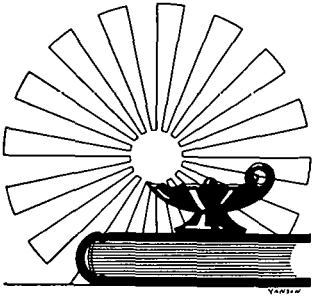
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	AR
Project Name	University of AR

The Engineering Department at the University of Arkansas at Little Rock has a data acquisition system which is able to measure voltage, wind speed, temperature, etc., and convert the measurements into data which can then be used to evaluate various solar powered systems. They plan to use it on solar equipment they will be building in the future.

U.A.L.R.'s Engineering Department offers a sophomore level introductory course on alternative energy technology, a junior level course on solar energy systems, and an energy conservation technology course.

Organization	University of at Little Rock
Address	33rd & Univ. Ave., Little Rock, AR 72204
Contact	Pete Tschumi
Telephone	(501) 569-3364
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

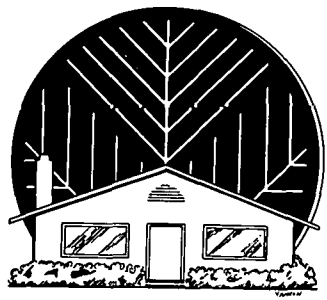
Category	Housing
State	AR
Project Name	Coppage House

Oliver Coppage is building a 4,200 ft^2 house that will be heated and cooled by an electric water pump system. Coppage intends to install solar panels to preheat the inflowing water. This will cut the amount of BTU's needed to heat the water, allowing him to install a smaller electric system than the house would normally require.

Coppage also intends to tie his domestic water supply into the solar preheating arrangement.

As a possible secondary benefit of his project, Coppage may have students of the Mississippi County Community College's solar technology program using his new house as a lab project.

Organization	Coppage House
Address	Highway 312, Blytheville, AR 72315
Contact	Oliver Coppage
Telephone	(501) 763-0775
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



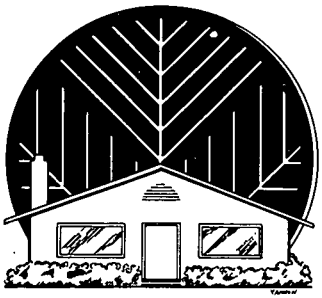
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Earth Sheltered Home

Grady Green began work in the summer of 1979 on his earth sheltered home in War Eagle, Arkansas. It will be a ferro in a small, southern-facing hillside by the War Eagle River.

The house will be totally sun and wood powered with passive design to utilize the winter sun, and fans to pull hot air from the wood stove flues to warm the bedroom and bath in the back. Green reported that he first had the idea in 1968 and has been working on the design since 1972.

Organization	Grady Green
Address	South Arrow at War Eagle Rt. 5, Box 412 Rogers, AR 72756
Contact	Grady Green
Telephone	(501) 789-2300
Funded By	n/a
Cost	n/a
Congressional District	n/a
Compilation Date	February 1980

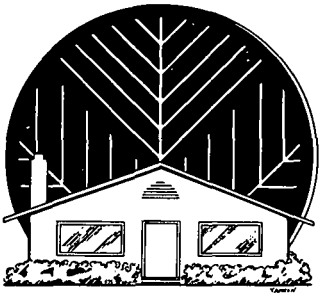


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Fayetteville Housing Authority

The Fayetteville Housing Authority is planning to build a wind generator on the top of Hillcrest Towers, a low-income high rise building for the elderly. Primarily for demonstration purposes, the system will generate approximately 600 KVA's and provide from three to four percent of the building's power.

Organization	Fayetteville Housing Authority
Address	#1 North School, Fayetteville, AR 72701
Contact	Chad Kumpe
Telephone	(501) 521-3850
Funded By	DOE
Cost	$7,402
Congressional District	III
Compilation Date	February 1980



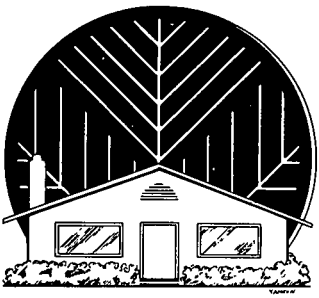
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Massery Contruction Company

Mr. and Mrs. Massery and their nine children live in their 2,500 ft^2 underground home, which they finished building in March of 1979.

They heat totally with wood and their electric bill was under $220 for the two months of summer, when they use an air conditioner due to the subterranean location, according to Mrs. Massery.

Organization	Massery Construction Company
Address	P.O. Box 28 Conway, AR 72032
Contact	Mary Jo Massery
Telephone	(501) 329-5245
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Residential Photovoltaic System

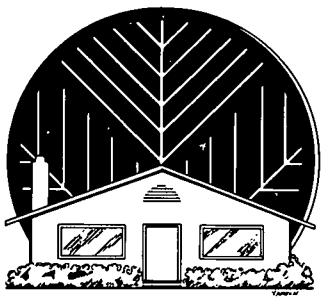
Joel Davidson and his wife built their totally self-sufficient house in twelve days. It is equipped with photovoltaic roof panels that generate electricity for lights, TV, stereo and pumping water. When not needed, electricity is stored in deep-cycle batteries located in the house. This past January the system supplied one fourth of the home's electrical needs, and in June it was able to provide 100 percent. Joel Davidson built a homemade generator to supply the remainder of his electricity. He estimates his total cash outlay at $600. They have had no commercial electricity for four years.

Davidson is now in the process of installing a wind generator and additional photovoltaics.

Davidson has had ten years of experience, both in Arkansas and California, in designing and building all types of solar equipment. He also supervises the Office of Human Concerns' solar wall collector installation project and other appropriate technology projects.

Organization	Joel Davidson
Address	General Delivery Pettigrew, AR 72752
Contact	Joel Davidson
Telephone	(501) 636-7301

Funded By	n/a
Cost	$600
Congressional District	III
Compilation Date	February 1980

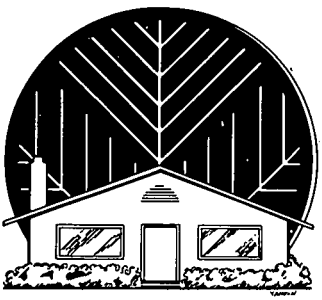


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Rimkus House

Tom Rimkus plans to use run-off water from an existing spring to cool his house, utilizing the flow of gravity. He will preheat his domestic hot water by running water over an extra tin roof to be constructed over his existing roof. The water will be collected and as the hot water naturally rises, the warmer water will be syphoned off, and run through a small pump to the conventional water heater.

Organization	Tom Rimkus
Address	Huntsville, AR 72740
Contact	Tom Rimkus
Telephone	n/a
Funded By	DOE
Cost	$1,405
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Self-Designed Solar System

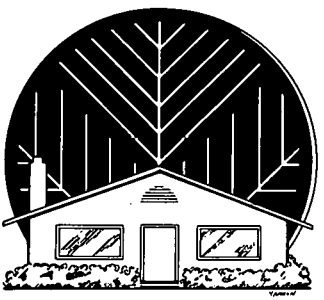
Millard J. Burke has a solar space heating system which he designed and built himself for about $1,500 in materials. The system provides heat for a bedroom, den and bath. Heat from the sun is reflected from an aluminum-covered roof, over a "valley" in the roof, and on to another slanting roof covered with corrugated, 8' x 36', fiber glass panels. Hot air is trapped between the fiber glass and a layer of styrofoam and insulation covered with black tar roofing paper. Fans blow air through the space and into the house via ducts, which are closed on cloudy days when butane back-up heat is used.

For domestic hot water, Burke ran coiled copper tubing through a portion of his solar roof collector.

Burke also has constructed a collapsible solar greenhouse for winter gardening. The greenhouse frame is covered with heavy plastic. Water is pumped through black plastic pipes, where it is heated by the sun. Hot water is stored underground in 55-gallon barrels.

Organization	Millard J. Burke
Address	414 Dakota, Marianna, AR 72360
Contact	Millard J. Burke
Telephone	(501) 295-3684

Funded By	n/a
Cost	$1,500
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Solar Hot Water System

The Guthrie's homemade solar water heating system consists of a 66-gallon storage tank, a converted electric hot water tank, and two flat plate collectors with a 52 ft^2 surface area. An electric hot water booster pump is used to circulate water through the collectors on sunny days. Circulated water is removed from the bottom of the tank and returned to the top.

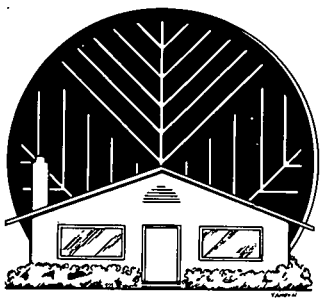
From April 15 to October 15, the solar system provides about 85 percent of the domestic hot water needs. On a sunny day, the unit is able to heat 66 gallons of water to 135-140 degrees F.

The collectors are built of weather-treated pine and insulated with four inches of fiberglass. The collector bottom is made of 24-gauge galvanized iron, and the collector plate is made from ½" copper pipe soldered to eight-ounce copper sheets. The two collectors, connected in series, are mounted to the roof in an east-west orientation. They may be tilted to the sun's angle according to the season. At the top of the system are an air eliminator valve and a pressure/temperature relief valve.

The pump is automatically turned on in the morning and shut off in the afternoon. The rate of water flow through the system is controlled by a by-pass loop around the circulating pump. The collectors can be drained for maintenance during freezing weather.

The Guthries heat their home with wood. They also have a solar greenhouse and a solar oven.

Organization	Jon Guthrie
Address	Rt. 3, Box 478, Conway, AR 72032
Contact	Jon Guthrie
Telephone	(501) 329-5272
Funded By	n/a
Cost	$350.00
Congressional District	II
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Spatz Home

During 1975, the Spatzes designed a 2,740 ft^2 passive house, which they built the following year in Conway.

Rooms used most heavily during the day (the kitchen, family room and living room) all face south. During the winter months sunshine alone is sufficient to heat these rooms if the temperature outside is not below 32-35 degrees F.

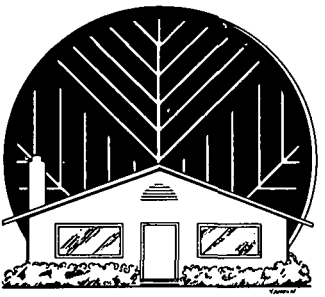
A 6' x 6" overhang protects the south windows from direct sunshine from April 1 to September 15.

During the Spring and Fall, these rooms are partly cooled by a gentle airflow that enters a window located low on the north wall, and exits through windows situated high on the south wall. The flow is maintained by the relative difference in air pressure between the hotter south side and cooler north side.

The house is also heavily insulated and outfitted with efficient fireplaces. In January and February of 1978 and 1979, an average of 28.25 mcf of natural gas was consumed by the two furnaces and two hot water heaters. This is slightly over 10 cubic feet of gas per square foot of house per month. Mean electricity use, including air conditioners, during June, July, and August for 1978 and 1979 was 1955 kwh, or approximately .71 KwH sq. ft./month.

Organization	Chris Spatz
Address	615 Davis St., Conway, AR 72032
Contact	Chris Spatz
Telephone	(501) 327-2615

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



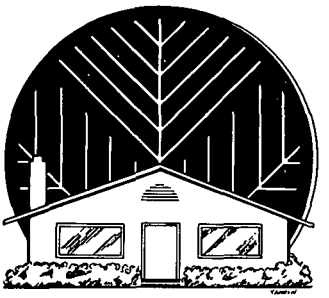
Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Triangular Solar Heater
Organization	Buck Ming
Address	Caddo Valley, AR 71935
Contact	Buck Ming
Telephone	n/a
Funded By	n/a
Cost	$65.00
Congressional District	III
Compilation Date	February 1980

Buck Ming, with the help of the town mayor, built a solar water heating system for his home that saves him six to ten dollars a month, depending on the sun. He used a blackened 55-gallon barrel, which he enclosed in a double-walled triangular box-like structure covered by clear plastic.

Two sides point south, and the rear wall (next to the house) has four inch styrofoam insulation. The whole structure rests on a base of marine plywood and a 12" styrofoam pad. The barrel contains water covered with a pint of motor oil to reduce evaporation.

The cold water is pumped through a 30-ft coiled copper tube immersed in the barrel and connected to the home's standard water heater. The connecting hoses are well wrapped in insulation material.



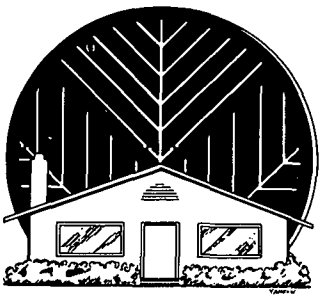
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	AR
Project Name	Wood Stove Water Heater

Annee Littell, a member of People's Action for Safe Energy (P.A.S.E.), has a simple domestic water preheat system in her home. The standard gas water heater was first raised to a higher level than the wood stove in the adjacent room. Two holes were drilled in the wall, and coiled copper tubing was run from the water heater through a section of the stove pipe and back again. When there is a fire in the stove, the water circulates and is heated without gas.

Littell reports that once, by maintaining a fire in the stove when the gas was turned off for two days, the preheat system was able to meet the hot water needs of the two families occupying the upper house and basement apartments.

Organization	People's Action for Save Energy
Address	401 Watson, Fayetteville, AR 72701
Contact	Annee Littell
Telephone	(501) 442-7999
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	AR
Project Name	Fuel Saving Schemes

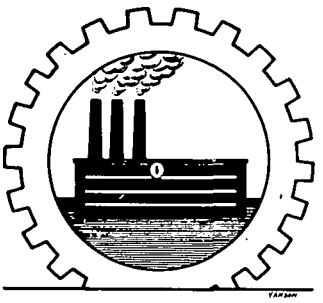
Lomanco, Inc. is located in an industrial area in Jacksonville where all of the factories open at 7:00 a.m. and close at 3:30 p.m.

Mr. Beldon came up with an energy and time saving idea to ease traffic congestion. Lomanco now opens at 6:50 a.m. and closes at 3:20 p.m.

Beldon also had the stop sign at the parking lot exit changed to a yield sign in order to prevent cars from idling in line while leaving the lot after work.

Organization	Lomanco, Inc.
Address	P.O. Box 519 Jacksonville, AR 72076
Contact	D.R. Beldon
Telephone	(501) 982-6511

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



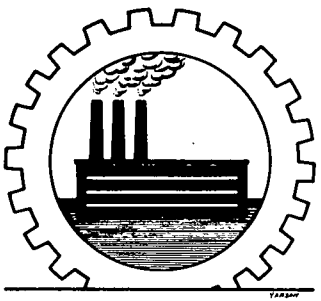
Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	AR
Project Name	Great Lakes Chemical Corporation

The Great Lakes Chemical Corporation, the Arkansas Power and Light Company, and Daedalean Associates of Washington, D. C. are jointly working to recover energy from geothermal brine in Merryville, 15 miles southwest of El Dorado. Normally brine is pumped back into the ground after the bromine is extracted. However, a small pilot plant (100 kilowatt) is now used to research the recovery of energy from this free brine before it is pumped back into the ground.

The corporation is hoping to be able to build a bigger plant (30 to 50 times larger) in the future to begin using South Arkansas vast resources of geothermal energy.

Organization	Great Lakes Chemical Corporation
Address	P.O. Box 1878, El Dorado, AR 71730
Contact	Tom Mathus
Telephone	(501) 862-5141
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



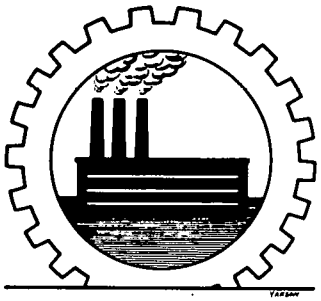
Renewable Resources— A National Catalog of Model Projects

Category	Industrial
State	AR
Project Name	Magee Company

The Magee Company uses wood shavings and sawdust from their manufacture of picture frames to produce compressed firewood.

Ten logs, weighing a total of 55 lbs., can produce approximately 94,000 Btu at a cost of $2.10.

Organization	Magee Company
Address	P.O. Box 507, Pocahontas, AR 72455
Contact	B. F. Bigger
Telephone	(501) 892-5227
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

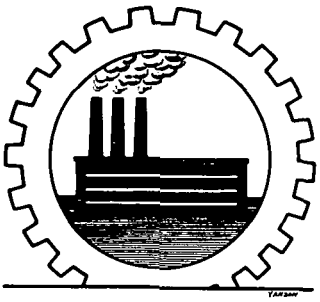
Category	Industrial
State	AR
Project Name	Wood Waste Recovery

A boiler was installed which is able to utilize waste bark from the Weyerhauser Paper Mill in Pine Bluff to produce power for the paper-making process. The system replaces 1.2 billion cubic feet of natural gas consumed by the Mill annually.

A typical plantation with 300 trees per acre, (10-15 years old) produces one ton of bark per year. This bark yields energy equivalent to four cubic feet of natural gas.

This new system saves enough natural gas to heat 40,000 central Arkansas homes for that year.

Organization	Weyerhauser Wood Waste Recovery
Address	P.O. Box 7875, Pine Bluff, AR 79611
Contact	Heartwell Major
Telephone	n/a
Funded By	n/a
Cost	$2,000,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	AR
Project Name	Duty Cycling System

In the Fall of 1976, Henderson State University purchased a small computer and set up a "Duty Cycling System", expanding its existing energy conservation program. This system controls air heating and cooling, and lighting.

Each of the campus's eleven buildings is independently programmed for hours of operation and hourly off-times. For example, the heating or cooling of one building may be programmed to cut off the first 15 minutes of every hour. Other buildings would "cut off" according to their use and purpose.

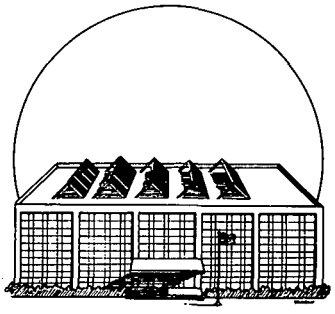
This cycling system reduces the peaks and valleys of energy consumption, and is not discernable to the persons occupying the buildings. The computer also eliminates the necessity for individuals to actively adjust controls and switches. The cycles can be varied daily to adapt to changing energy requirements.

The August-September monthly electricity period was 250,000 units less than the same period just before the computer system was installed. And the campus has added at least 100,000 cubic feet more space since the installation of the system.

Through an experiment on one building, the State Department of Energy will establish temperature formulas for controlling the air cooling system.

Organization	Henderson State University
Address	Hwy. 67E, Arkadelphia, AR 71923
Contact	Jim Andrews Guy Hayes
Telephone	(501) 246-5511

Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	AR
Project Name	MCCC Photovoltaic System

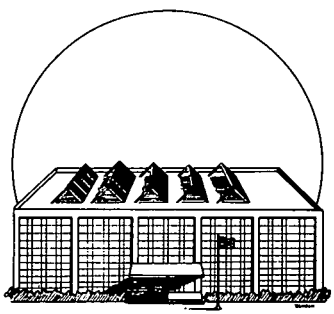
Mississippi County Community College at Blytheville, Arkansas, will derive its electrical and thermal energy from an actively cooled photovoltaic system being developed under the management of TEAM, Inc. This 320-Kw concentrator system (DOE standard conditions) will be the world's largest photovoltaic demonstration. Moreover, thermal energy from the solar cell coolant will be provided to the College for winter heating and year-round domestic hot water.

The single-axis tracking collectors are 7' x 20' parabolic troughs with a geometric concentration of 42. The solar cells are made of single-crystal silicon, designed to match the physical and spectral parameters of the collector. The power system will provide not only for back-up power, but for a power exchange between the solar and the local utility.

Begun in the fall of 1977, the energy system is expected to be operational in the winter of 1979, with connection to the College facilities in the summer of 1980.

The College curriculum includes a program in Solar Technology. The new solar energy system will thus provide both power source and a hands-on teaching tool for alternative energy instruction.

Organization	Mississippi County Community College
Address	Blytheville, AR 72315
Contact	Harry V. Smith
Telephone	(501) 762-1020
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	AR
Project Name	St. Edward Mercy Medical Center

The St. Edward Mercy Medical Center's comprehensive energy management program has been functioning in partial completion with tremendous success.

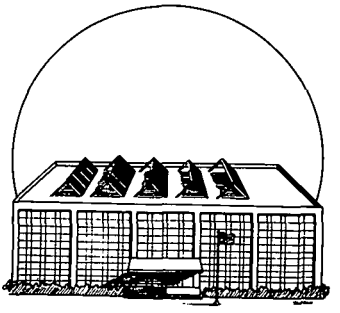
The first step involved the installation of a computer system that monitors temperatures and cycles the air-handling units. The system can adjust airflow from a cool area to a warmer region without additional energy consumption. Air handling units may also be shut down for a few minutes every quarter hour without loss of personal comfort. The system can be programed to shut down unused areas at night and on weekends.

Some windows will receive twin qlass and some have had reflective window-film applied to conserve or block heat. The chiller and boiler systems have received energy-efficient modifications. Incandescent lighting will be replaced by fluorescent, and mercury vapor bulbs have been replaced by high sodium bulbs in parking lots.

An exhaust air rcoovery system will be installed to trap heated and refrigerated air, which can be used to preheat or pre-cool fresh air. A chiller bypass on the cooling tower will permit outside air to chill water in the winter.

The estimated cost of the total program is $259,000. The estimated savings per year is $136,500. The overall payback period is 23 months.

Organization	St. Edward Mercy Medical Center
Address	7301 Rogers Ave. Fort Smith, AR 72903
Contact	Jim Hannah
Telephone	(501) 452-5100
Funded By	n/a
Cost	$259,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	AR
Project Name	Energy Conservation Law
Organization	Arkansas Department of Energy
Address	3000 Kavanaugh Blvd., Little Rock, AR 72207
Contact	Scott Trotter
Telephone	(501) 371-1370
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The Energy Conservation Endorsement Act of 1977, Ark. Stats. Ann. 73-2501, et seq. - represents one of the first substantive pieces of legislation in Arkansas to address energy conservation. The Legislature recognized both that enormous amounts of energy are wasted and that the conservation of natural gas and oil, as well as alternative forms of energy, is an overriding public interest.

Following passage of the Act, it was considered an essential function of public utilities to engage in energy conservation programs. After notice and hearing, conservation measures may be approved and ordered into effect by the Commission if the measures are beneficial to ratepayers and the utilities themselves.

In such cases, the Commission is authorized to declare that the cost of such conservation measures is a proper cost of providing utility service. If the measures are ordered into effect, the Commission will allow the utility to increase its rates or charges to recover any costs incurred as a result of such programs.

This legislation would allow Arkansas to implement an "Oregon Plan" for weatherization of homes in the state, whereby utility companies make interest-free loans available to ratepayers on a delayed-payback basis.

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	AR
Project Name	Energy Management Law
Organization	Arkansas Depar... of Energy
Address	3000 Kavanaugh Blvd., Little Rock, AR 72207
Contact	Scott Trotter
Telephone	(501) 371-1370
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The Arkansas Energy Reorganization and Policy Act (Act 255 of 1979) created the Arkansas Department of Energy as a principal department in the executive branch of Arkansas state government. The Arkansas Energy Conservation and Policy Office was abolished, and its powers, duties, functions, records and personnel were transferred to the Arkansas Department of Energy.

Under the provisions, the Arkansas Department of Energy is responsible for coordinating energy matters between and among state agencies, planning an efficient delivery system to meet the state's future energy needs, compiling a state energy profile, and analyzing manpower requirements for energy development in the state. The Department is also responsiblc for organizing emergency distribution of petroleum products. The Department was authorized by the provisions of the act to develop and promulgate thermal and lighting efficiency standards for new building construction in Arkansas, and to develop thermal and lighting efficiency improvement programs for all state-owned buildings.

Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	AR
Project Name	Energy Savings Tax Incentive Act

The Energy Savings Tax Incentive Act of 1979 grants to taxpayers (individual, corporate and fiduciary) a deduction from gross income for the cost of purchasing and installing certain energy conserving items and renewable resource properties. These include solar, wind, wood and biomass. The State income tax deduction, coupled with the federal income tax credit, has made investment into weatherization and conversion to renewable energy source properties attractive from a tax savings standpoint.

Located in the Sun Belt and blessed with an abundance of hardwood forests, Arkansas has ideal environmental conditions for converting from traditional fossil fuel sources to such fuels as solar and wood. As petroleum and natural gas continue to rise in cost, renewable energy sources are becoming more and more attractive to the homeowner and the business person as a means to reduce their energy expenditures.

Organization	Arkansas Department of Energy
Address	3000 Kavanaugh Blvd., Little Rock, AR 72207
Contact	Scott Trotter
Telephone	(501) 371-1370
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	AR
Project Name	Gasohol Fuel

On March 20 of 1979, Governor Bill Clinton signed into law Act 433. This enactment provides for a total exemption from the 9.5 cents per gallon motor fuel tax for gasohol, which consists of at least 10 percent alcohol manufactured in the state from agricultural or forestry products. This legislation also provides a tax exemption for gasohol from another state, if that state reciprocates and exempts Arkansas-manufactured alcohol.

This tax exemption coupled with the four cents per gallon federal tax exemption, has created a considerable amount of activity in Arkansas with regard to alcohol-fuels production. There is currently one commercial-sized gasohol plant under construction in the state and plans are being made for several others. In addition, the decision of the Bureau of Alcohol, Tobacco, and Firearms to permit experimental distilleries has led to a number of small-scale alcohol operations.

Organization	Arkansas Department of Energy
Address	3000 Kavanaugh Blvd., Little Rock, AR 72207
Contact	Scott Trotter
Telephone	(501) 371-1370
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	AR
Project Name	Office of Human Concerns

The Office of Human Concerns received a $10,000 grant through the Community Service Administration to weatherize low-income homes. The Office received an additional $5,000 and four CETA workers to build and install 30 solar air heaters.

The units are only attached to homes that qualify for weatherization and that have an ideal southern exposure. There is no cost to qualified recipients.

The pre-built, 4' x 8' collectors are modular, and can be grouped to 4' x 16' or 8' x 8' (horizontally or vertically). The simple construction requirements lend them to small-scale production.

Critique/analysis: The mounted collectors have already sparked community interest. The Office of Human Concerns is planning to distribute a booklet on how to build the wall collectors.

The Office has applied to the State Department of Energy for a grant to build 40 more units.

Organization	Office of Human Concerns
Address	224 S. 2nd St., Rogers, AR 72756
Contact	Bill Brown
Telephone	(501) 636-7301
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

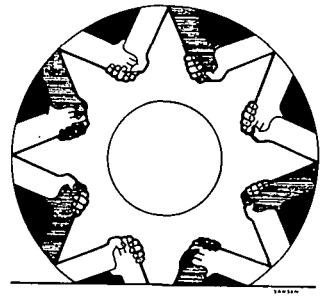
Category	Outreach
State	AR
Project Name	Arkansas Solar Coalition

The Arkansas Solar Coalition (ASC) is a non-profit organization that, through a variety of programs and activities, plans to promote the development of conservation and renewable energy sources, particularly solar.

The Coalition hopes to become a clearing-house for information in the state.

Critique/analysis: It is envisioned that ASC will develop the capability to lobby on behalf of solar energy before the State Legislature.

Organization	Arkansas Solar Coalition
Address	1145 West Hern, Blytheville, AR 72315
Contact	James Deal
Telephone	(501) 762-2769
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	AR
Project Name	La Modern Civic Club of Little Rock
Organization	La Modern Civic Club of Little Rock
Address	2919 Misty Lane, Little Rock, AR 72207
Contact	Dorothy Shively
Telephone	(501) 227-6600
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

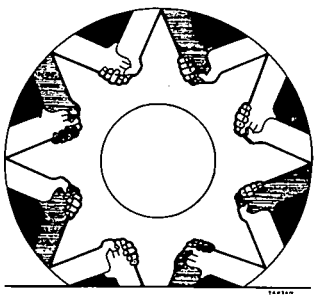
La Modern, a thirty-member group sponsored by the Arkansas Department of Energy, has an educational energy program, featuring slides and a minature model house, which demonstrates the benefits of insulation. The group presents the program on request to public schools, colleges, clubs and businesses.

La Modern has also presented energy programs for the Aldersgate Medical Camp, has contributed to Sun-Day activities, and has participated in an energy seminar with Bell Telephone Company.

Currently, the organization is participating in a contest sponsored by the Owens Corning Company to promote energy conservation in the home. They have distributed home energy checklists in offices, schools and libraries to assist people in learning how they use energy and how they can cut down.

La Modern is working with the Boy Scouts of America to provide and install weatherization materials on windows of low income homes. They also have spots on local radio to give energy conservation tips.

La Modern is a member of the Arkansas Federation of Women's Clubs and the General Federation of Women's Clubs.



Renewable Resources—A National Catalog of Model Projects

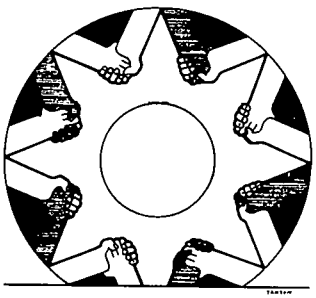
Category	Outreach
State	AR
Project Name	Mississippi County Energy Office
Organization	Mississippi Co... Energy Office
Address	Blytheville, AR 72315
Contact	Rita Baker
Telephone	(501) 763-5110
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The elected officials of Mississippi County have created the first county-based energy office in the state.

Presently, the office is working with the Blytheville High School shop students on a small-scale solar reflective cooker. In August of 1979 instructor Rita Baker was asked to appear on a television program for a station in Jonesboro to discuss solar energy feasibility for homes. Projects with the Girl Scouts and Economic Opportunity Center summer camps turned several hundred children into "Solar Energizers".

After receiving training on home energy audits from the Arkansas Department of Energy, Baker is now qualified to enter homes in the county, upon request to evaluate the structures.

They hope to provide information on all of the region's alternative energy sources, and they intend to promote and encourage energy conservation in homes, business and industry. They are presently operating on a zero budget, but hope to be granted funding soon.



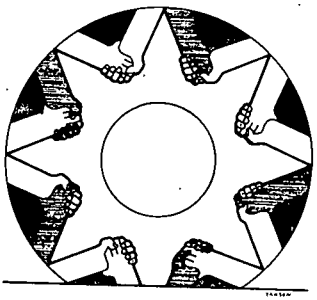
Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	AR
Project Name	Ozark Institute

The Ozark Institute is a private, non-profit organization committed to conducting research, providing information and training on appropriate technology. The organization publishes a newsletter, "Ozarka"; it also has recently published a solar greenhouse guide.

The Institute has a portable greenhouse demonstration unit, a solar food dryer, and slide shows on appropriate technology, passive solar and greenhouse construction. Its building has a vertical wall collector on the south wall. The organization also has a well equipped library an appropriate technology.

Organization	Ozark Institute
Address	Box 549, Eureka Springs, AR 72632
Contact	Edd Jeffords
Telephone	(501) 253-7384
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	State
State	AR
Project Name	AR Children's Colony

The Jonesboro unit of the Arkansas Children's Colony implemented an Energy Management Program on January 1 of 1978 to reduce maintenance and operation expenses. Most measures simply required turning off equipment when not in use, putting timers on boilers, lowering temperatures on hot water tanks and removing unnecessary lighting. Efficient equipment was also added, such as switching to thermoplex glass when replacing broken windows. The program plan includes some thirty items which cost very little or nothing. The program involved total staff cooperation.

In January of 1977, two additional cottages were opened, an addition of 9000 square feet, in December of 1978, a multipurpose building opened, adding another 9,000 square feet.

Nevertheless, from 1977 to 1978 the Colony's use of electricity went down from 1,714,200 to 1,595,300 Kwtt. That same year their use of natural gas went up by 3,268,000 cu. ft. to 18,322,000 cubic feet.

Organization	Dept. of Human Ser. Arkansas Children's Colony
Address	4701 Colony Dr., Jonesboro, AR 72401
Contact	Thomas M. Lewins
Telephone	(501) 932-4043
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AR
Project Name	Arkansas Dept. of Energy (ADOE)
Organization	Arkansas Dept. of Energy (ADOE)
Address	3000 Kavanaugh Blvd., Little Rock, AR 72207
Contact	Scott Trotter
Telephone	(501) 371-1370
Funded By	n/a
Cost	$2 million budget
Congressional District	II
Compilation Date	February 1980

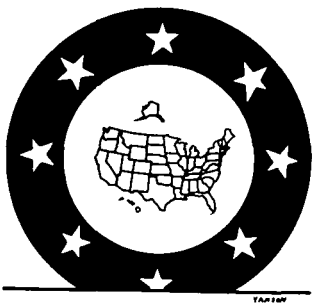
The State Legislature created the Arkansas Department of Energy in 1979. Both the State Energy Conservation and Policy Office and the Arkansas Energy Advisory Council were transferred to the new department. ADOE's budget for FY 1979 (from federal and state funding) is approximately $2 million.

Department responsibilities include planning an energy-efficient fuel delivery system to meet the state's future energy needs. In performing this function, ADOE will forecast supply and demand for renewable and non-renewable energy resources, predict the need for additional electric generating capacity, and perform comparative forecasts based on alternative system scenarios.

The Department administers a $100,000 energy innovation grant program, and a $50,000 solar demonstration grant program. Recognizing that traditional fuels and power already have strong constituencies, the Arkansas Department of Energy is committed to building a new constitutency for conservation and renewable energy.

In addition, ADOE will monitor safety procedures of nuclear power production, nuclear fuel transportation and handling, and the storage and disposal of radioactive materials.

The Department has four divisions: Policy, Fc sting and Systems Analysis, Conservation ar newable Energy, and Outreach. The Policy Division exercises responsibility in nuclear safety, state and federal legislation, utility regulatory programs, state/federal relations, intergovernmental coordination, and policy planning.



Data and systems analysis, economic forecasting, and energy profile publications are handled by the Forecasting and Systems Analysis Division. The Conservation and Renewable Energy Division implements programs which promote the use of conservation, solar, wind, biomass, wood and hydro power. Publications, publicity, energy extension and outreach, and advertising rest under the direction of the Outreach Division.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AR
Project Name	Arkansas State Employees Assoc., Inc.

The Arkansas State Employees Association, Inc., is a non-profit organization working on a van-pooling project to transport the 600 employees who live outside the Little Rock and North Little Rock city limits. The project will require forty 15-passenger vans, at a cost of approximately $350,000.

Until financing can be secured, ASEA has leased some vans, which made their first runs from Conway and Sheridan, in July of 1979. The employees pay a pre-determined amount from their pay check each week, amounting to about 2½ to 3 cents per passenger/mile.

Organization	Arkansas State Employees Assoc.
Address	P.O. Box 1588, Little Rock, AR 72203
Contact	L. D. Owen
Telephone	(501) 378-0187
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AR
Project Name	DECRA

The Division of Energy Conservation and Rate Advocacy (DECRA) was established by the Attorney General's Office in September of 1977 to provide representation of consumers' interests in electric utility regulatory proceedings before the Public Service Commission.

Utility rate increase requests, power plant sitings, rate structure hearings, power company mergers, and the like are among those topics covered by DECRA. The office not only advocates consumers' interests, but also assists consumer-oriented groups in making presentations in electric rate cases.

A second and major function of DECRA is to develop and foster in-state resources for consumer-interest advocacy in electric utility cases.

DECRA addresses the vast disparity in resources between utility companies and consumer interest groups by providing funding to consumer groups for hiring consultants and attorneys.

A third function of DECRA is the advocacy of consumers' interests before the Litigation Division of the Attorney General's Office. The primary goal is to achieve as fair and equitable rate structure as possible. In this way, DECRA's aim is to shift utility investments away from additional power plants and towards investment in renewable resources and energy conservation.

Organization	Div. of Energy Conservation & Rate Advocacy
Address	Justice Bldg., Little Rock, AR 72201
Contact	Mark Davis
Telephone	(501) 371-1967
Funded By	n/a
Cost	$2 million
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	State
State	AR
Project Name	Department of Parks and Tourism
Organization	Department of Parks and Tourism
Address	1 Capitol Mall, Little Rock, AR 72201
Contact	Gordon Mallar, Jr.
Telephone	(501) 371-7646
Funded By	Ozark Regional Commission
Cost	$100,000
Congressional District	II
Compilation Date	February 1980

The Department of Parks and Tourism, with the help of the Arkansas Department of Energy, plans to try and restore a low head hydroelectric generating plant located in Mammoth Springs State Park.

Built in 1927, the plant was closed down in 1971 by Ark-Mo Utility Company, and has been unused since. It was first decided that the plant could be restored as a simulated exhibit for tourists, but now the plan is to attempt to make it functional.

The program has three phases, Phase one will use $5,000 for a feasibility study. Planners must determine whether all the necessary machine parts can be found (all the initial builders have already been located); what the environmental impact will be; what are the legal ramifications of operating a utility, selling power to utilities, or power line construction; and whether the dam will still be high enough to produce power.

If phase one is successful, phase two will involve restoring the plant as a demonstration project only.

Phase three will study the restoration as an actual generating plant to investigate what the long term maintenance costs would be; whether they outweigh the production profits; and whether the plant could be sold, if necessary.

Renewable Resources— A National Catalog of Model Projects

Category	State
State	AR
Project Name	State Transportation Conservation

Five energy conservation projects of the Arkansas State Highway and Transportation Department are now in progress.

The first program provides funds to non-profit organizations for capital purchases of vehicles for transporting elderly and/or handicapped persons.

Second, the conceptual design for an Express Bus facility along I-630 has been approved by the Federal Highway Administration to provide park and ride lots at strategic locations. This is now in the preliminary engineering stage.

Third, the Rural Public Highway Demonstration Program provides for two projects, and in central and the other in northwest Arkansas, funded at about $500,000 by Section 147 of the 1973 Federal-Aid Highway Act. This program calls for establishing mass transportation service for rural areas within designated counties. The projects have been operating successfully for 18 months.

The fourth is a pilot project involving commuter car-pools and a commuter parking lot constructed on Dixon Road and U. S. 65 just over a year ago. This parking lot has been a big success, and plans are being made to double its size and provide lighting. Six additional park and ride lots are being planned, and two car-pool lots are being constructed at Benton and Cabot.

Finally, a van-pool Demonstration Program is being developed which would initially provide 40 vehicles for State and Local Government agencies. Federal-Aid Highway funds may be used to pay for 75 percent of the vehicle cost, which may be repaid over a four year period at no interest. If successful, it will probably expand statewide.

Organization	Arkansas State Hwy. & Transportation Department
Address	P.O. Box 2261, Little Rock, AR 72203
Contact	Jimmie D. Head
Telephone	(501) 569-2286

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

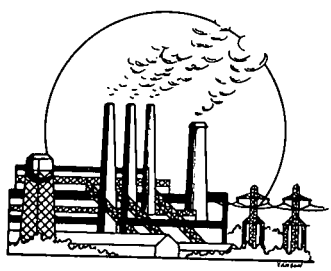
Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	AR
Project Name	Arkansas-Louisiana Gas Company

The Ark-La Gas Company office building in Little Rock has a co-generation heat recovery system. Ark-La generates its own electricity with internal combustion engines, and traps about 50 percent of the exhaust heat to run a stack boiler. The boiler in turn provides all the needed energy for heating the building in the winter and 75 percent of its summer cooling requirements.

Not only does this make the Ark-La building more energy efficient, but it allows the Company to easily comply with the new Federal heating and cooling regulations.

Organization	Arkansas-Louisiana Gas Company
Address	400 E. Capitol, Little Rock, AR 72201
Contact	William Connell
Telephone	(501) 372-6241
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

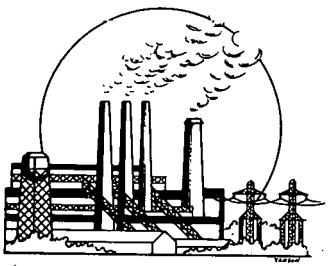
Category	Utility
State	AR
Project Name	North Arkansas Electric Coop.
Organization	North Arkansas Electric Cooperative
Address	Box 1000, Salem, AR 72576
Contact	Charles Elliott
Telephone	(501) 895-3221
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The North Arkansas Electric Co-op (NAEC) has joined with other Arkansas electric co-ops to form an Energy Conservation Cooperative to insure the availability and quality of weatherization materials. This statewide organization installs weatherization materials such as insulation, storm windows and doors, and power attic ventilators.

For those members who need financial assistance, the North Arkansas Electric Co-op works with the Farmer's Home Administration and with banks and other lending institutions to provide weatherization. The member may make payments on these loans along with his/her monthly electric bill.

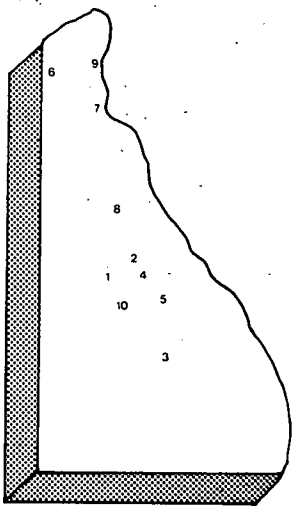
NAEC also offers home energy audits and technical assistance regarding alternative energy sources. Wood heat is the primary alternate source since most members live in rural areas where wood is plentiful. Advice is also given on solar heating and solar water heating.

This summer, NAEC participated in an Energy Conservation In-Service Training Workshop sponsored by the State Department of Education. NAEC contributed a section on weatherization.



DELAWARE

1. Camden
2. Dover
3. Georgetown
4. Magnolia
5. Milford
6. Newark
7. New Castle
8. Smyrna
9. Wilmington
10. Woodside



DELAWARE

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Category	Agricultural
State	DE
Project Name	Solar Chicken Coops

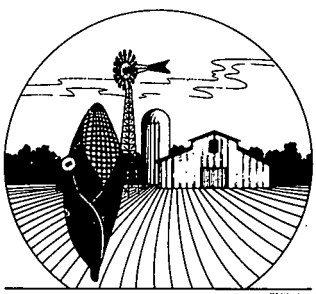
The goal of this project is to analyze the feasibility of using a concentrating solar collector system to heat the ventilation air in chicken shelters when the chickens are brooding.

This project was begun about three years ago with Federal Funds, which allowed the development of computer modeling for solar and conservation measures. At a cost of $2 to $3 per square foot, an economic analysis concluded that a concentrating collector system would be needed to reach the desired heating temperatures (90°F). A collector was developed this past year. A demonstration model will be built at the Georgetown substation. Most likely, this system will economically produce one-half of the heating requirements for the shelters.

The demonstration project began in July of 1979 with construction scheduled for completion by October of 1979. Data will be obtained through the winter with the grant funding designated to end in June of 1980.

Critique/analysis: There is doubt about whether the system can be developed for $2 to $3 per square foot. In addition, there is concern that concentrating collectors are not efficient in Delaware due to the diffuse nature of insulation ugh the humid atmosphere.

Organization	University of Delaware Agriculture Extension
Address	Agriculture Hall University of Delaware Newark, DE 19711
Contact	Norm Collins
Telephone	(302) 738-2468
Funded By	Department of Engineering, U.S. Department of Agriculture
Cost	$35,000 approximately
Congressional District	I
Compilation Date	February 1980



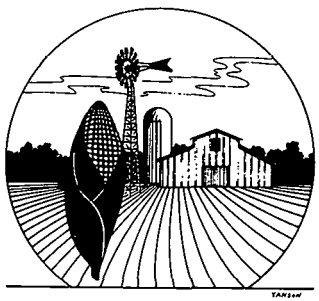
Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	DE
Project Name	State Farm Bureau

The State Farm Bureau is willing to cooperate with farmers to develop solar projects that could result in resource savings. Examples of potential projects include solar grain-drying, methane generation using farm wastes, and alcohol generation for farm equipment use. The Bureau will act as a clearinghouse for information on renewable resources for farmers.

Any farmer interested in developing a project is entitled to receive the Bureau's assistance.

Organization	State Farm Bureau
Address	233 South DuPont Highway Camden, DE 19934
Contact	Mr. Stevenson
Telephone	(302) 697-3185
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



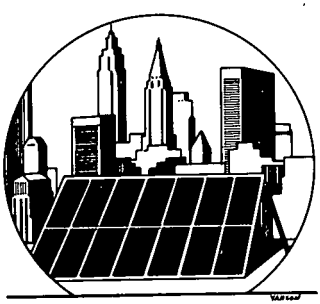
Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	DE
Project Name	Department of Planning

The Department of Planning for the City of Wilmington, with the assistance of L. H. Doane Associates, Inc., proposed a community facility called the South Bridge Center, which was to use approximately 50 percent solar systems for heating, cooling and domestic hot water. The application, submitted in 1977, was not funded because it was missing a system installers warrantee required by DOE. When DOE funded, funding by the City of Wilmington terminated. South Bridge Center is due for completion in April of 1980, using a gas-fired energy source.

The Wilmington Department of Planning continues to show interest in working with solar design, but no other projects are underway at this time.

Organization	Department of Planning
Address	City of Wilmington City/County Bldg. 800 French Street Wilmington, DE 19801
Contact	Walter Marder
Telephone	(302) 571-4695
Funded By	60 percent (now DOE); 40 percent City of Wilmington
Cost	$198,226
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Boy Scouts' Energy/ Conservation Program

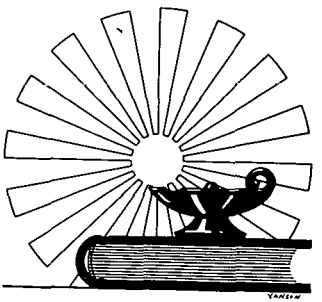
In the school year of 1977-78, the Boy Scouts of America council that serves the Delaware-Maryland-Virginia peninsula region (DEL-MAR-VA Council) launched an energy-education and conservation program. It was followed up in 1978-79 with a continued energy-conservation program.

Packets of information were sent to 592 Scout units throughout the Peninsula. The packets contained tips for saving energy, an energy-conservation plan for Cub Scouts, a home-energy savers quiz, a conservation checklist for the home, word of a Cub Scout poster contest, an Explorer essay contest, projects for Explorer Posts, and an entry form for a Scout essay contest on "An energy Conservation Plan."

During 1978 and 1979, 30,000 Project Conserve pamphlets were distributed throughout Delaware to Scouter's homes. Sixty thousand copies of the booklet "How to Save Money by Saving Energy" were also distributed throughout the Peninsula. Energy companies throughout the region participated by offering prizes (ribbons, certificates and savings bonds) for the essay and poster contests, conservation experiments, home-energy conservation plan awards, and other activities. 500 entries were received for the poster contest alone.

Scouters throughout the Peninsula are also learning to use solar equipment on campouts with help of the Round Table Commissioner of the Brandywine district, Rosemary Hickman. To earn the Solar Energy Merit Badge, Scouts have learned to make solar energy devices, control heat loss in solar equipment, and explain the need to conserve energy and how the sun affects their lives.

Organization	DEL-MAR-VA Council, Inc. - Boy Scouts of America
Address	8th and Washington St. Wilmington, DE 19801
Contact	Rudy Ruffin
Telephone	(302) 652-3741
Funded By	United Fund
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Critique/analysis: In the Delaware-Maryland-Virginia Peninsula, it is clear that the Boy
:s have a strong commitment toward solar
ɲy and conservation.

Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Community Solar Program
Organization	Magnolia CETA Solar Program
Address	Magnolia, DE 19962
Contact	Mayor Shirley Jarrell or Fred Duncan
Telephone	(302) 335-5675 or (302) 335-4553
Funded By	DOL, CETA
Cost	$21,500
Congressional District	I
Compilation Date	February 1980

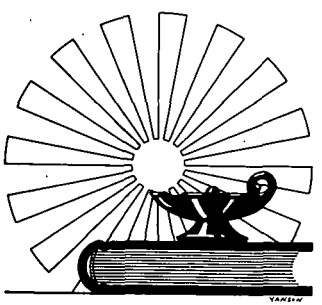
In the spring of 1978, Mayor Shirley Jarrell, then Town Secretary for Magnolia, and Rob Adams --both teachers at the Caesar Rodney, Jr. High School--designed a program to help employ youth in the area while also assisting the community at large. The program was under the Youth Community Conservation Improvement Program of CETA to train four youths in carpentry. The four were also to build three solar bus stops and five solar window hot air collectors.

The program was implmeneted in the fall of 1978 under the direction of Franklin J. Morris, a semi-retired Magnolia contractor. In February 1979, he helped show his handiwork at a solar do-it-yourself program in Dover. In April 1979, Frank and his trainees displayed a completed solar hot air collector at the Appropriate Community Technology Fair in Washington, D.C.

In the year that Frank Morris and his students have spent in Magnolia, they have constructed two beer can collectors (costing $38 and $52, respectively, for materials); one flat-plate collector (for demonstration); and a solar bus stop for McIluaine Elementary School. Though this may not sound like much for a year's work, the program has trained the youths in a variety of skills. Besides constructing the solar projects, Mr. Morris has had the youths working on many other community-improvementprojects.

Although Mr. Morris completed only one of the three solar bus stops and only one solar window by the end of his project year, other CETA program workers are now being trained to complete the project for Magnolia. One bus stop will be a combination greenhouse/bus stop. These will be completed prior to the September school opening.

The unusual application of solar energy-- combining the practical function of a shelter for children waiting for their school buses and a greenhouse to produce flowers for the town square --caught the imagination of local officials and solar advocates nationally.



The bus stop concept was simple--a three-sided structure, with a solar panel in the roof to trap the sun's rays and warm youngsters waiting for school buses on chilly mornings. The addition of flower boxes in at least one of the shelters was gned to provide a "nursery" for seedlings to be splanted later into town-maintained flower beds.

Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Delaware Solar Project Fair

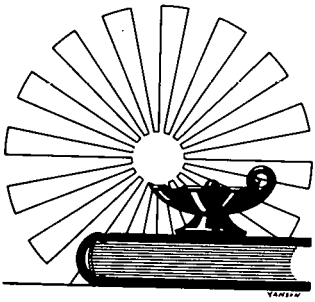
In the fall of 1977, Rob Adams, an earth science teacher at Caesar Rodney Jr. High School, Camden, Delaware, decided to find out how much the average student knows about solar energy and what can be done to heighten students' awareness of renewable resources. He devised three means by which he could bring about more student awareness.

For his first effort, Mr. Adams developed a set of solar labs that explained the basic principles of a tin-can solar collector he had built. These labs were applied in an energy unit he had also developed for his classes.

Second, he organized what he believes is the first and only Junior High Solar Science Club in the country. In two years, this club has built many solar projects and displayed them to the public throughout Delaware at least a dozen times, and it was chosen to participate in the Appropriate Community Technology Fair/ Conference in April of 1979 in Washington, D.C.

Finally, Mr. Adams organized the Delaware Solar Project Fair. This event has had two successful years in Dover at the Delaware Technical and Community College, Terry Campus.

Organization	Delaware Solar Project Fair
Address	1832 North duPont Hwy. Dover, DE 19901
Contact	Earl Roberts or Rob Adams
Telephone	(302) 678-5401
Funded By	Various industries and solar organizations throughout Delaware
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

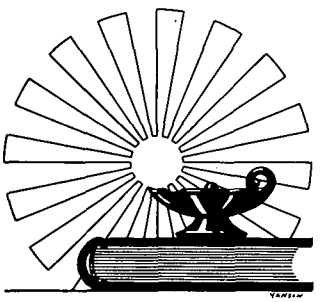
Category	Education
State	DE
Project Name	High School Energy Curriculum

In the last two years at Caesar Rodney Jr. High School, Rob Adams has been developing a complete unit on energy in his 8th grade Earth Science classes. The project has developed into a semester course on energy and the earth's resources.

During the semester, Adams has special experiments, demonstrations, guest speakers, movies, field trips, activities and lectures on various aspects of energy. He encourages his students to develop special projects for the school science fair.

Organization	Caesar Rodney Jr. High School
Address	25 E. Camden-Wyoming Ave. Camden, DE 19934
Contact	Rob Adams
Telephone	(302) 697-3203

Funded By	School Student Council
Cost	n/a
Congressional District	I
Compilation Date	February 1980



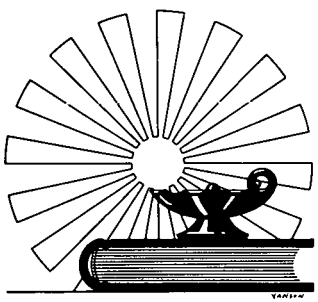
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Junior High Industrial Arts Summer Program
Organization	Milford Middle School
Address	Milford, DE 19963
Contact	Jeff Davis
Telephone	(302) 422-7595
Funded By	n/a
Cost	$1,100
Congressional District	I
Compilation Date	February 1980

Jeff Davis turned what could have been a regular summer program to learn regular industrial arts skills into a unique solar project this past summer at Milford Middle School. Mr. Davis received a federal grant of $1,100 to be spent for materials for a summer industrial arts program.

As Mr. Davis organized the project, it developed into a small 9' x 15' solar heated storage shed with the roof and sides covered with cedar shingles, the southern roof displaying a solar collector, and the south wall containing three large picture windows. After notifying many of his past 7th grade industrial art classes about the project, he was able to organize two shifts of students, about twelve in all. (Some students proved very dedicated to the construction program, while others drifted in and out.)

During the five-week program, students learned many planning and construction skills that they were able to put to practice in building their solar facility. Mr. Davis was very pleased with the product though he realized that he could never start a project of this nature during the regular school year. With the building only roughly finished during the summer program, he can now use the structure to both complete his solar project and teach his students the finer industrial arts.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Photovoltaic, Thermal Energy Storage, and Solar Research
Organization	Institute of Energy Conversion
Address	University of Delaware 1 Pike Creek Center Wilmington, DE 19808
Contact	Fraser Russell, Dir. Peggy Stallings, Energy Info. Center
Telephone	(302) 995-7155
Funded By	Government grants & contracts, private industries
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The Institute of Energy Conversion of the University of Delaware is an applied research institute working to bring renewable energy sources to consumers at prices they can afford. The Institute is also trying to increase the efficient use of non-renewable energy sources.

The work of the Institute is organized around three research and testing areas: photovoltaics research, thermal energy storage research, and solar water heater testing. (The Institute also performs information outreach services, which are described elsewhere in this catalog).

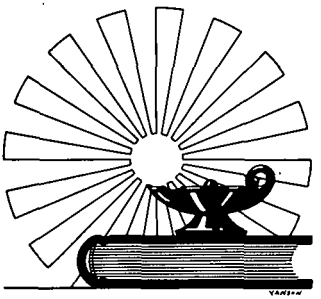
The Institute of Energy Conversion has earned a reputation as a world leader in the development of low-cost thin-film solar cells that convert sunlight directly into electricity.

The Institute's program is well ahead of the goals of the National Photovoltaic Program. This program is designed to achieve at least a 10 percent conversion efficiency in thin-film solar cells by 1980 and to demonstrate that solar cells can be produced for 50¢ per peak watt by 1986.

Historically, two problems have prevented widespread use of solar cells. Silicon, the material used in the most efficient cells produced to date, is very expensive. The materials used in the lower cost cells have not performed well, however.

The Institute's scientists have chosen to concentrate on improving the performance of low-cost solar cells. Since beginning to utilize their loss-minimization methodology in 1976, the Institute staff has set new performance records for these cells for three years in a row.

In June of 1978, the Director of the Institute announced that cadmium sulfide/copper sulfide thin-film solar cells developed at



the Institute has achieved a new level of energy-conversion efficiency at 9.15 percent. The Department of Energy called that achievement a significant contribution toward reaching the national photovoltaic goals.

Several new techniques to increase cell efficiency were developed recently. They include: improved electrical contacts and anti-reflection technology; detailed analysis of losses in fill factor; chemical treatments to remove the resistance losses; and improved control and analysis of cadmium sulfide properties to maximize cell output.

Institute researchers are also working on the next generation of thin-film cells. These cells use zinc phosphide as the principal material. Although the Institute fabricated the first devices ever made from this material, initial zinc phosphide cell efficiencies were less than 1 percent. Recently, Institute staff reported achieving efficiencies as high as 6.1 percent.

The Institute has also developed a low-cost thermal energy-storage system that uses hydrated salts as its storage medium. These salts can liberate or absorb large quantities of energy as they alternately freeze or melt. And, by varying the melting point of the salts, the Institute's scientists can store energy at different temperatures.

The Institute conducts basic research on the salts and develops prototype applications. The technology is then licensed to industrial companies for widespread commercialization. Storage systems using water and rocks have also been tried, but they tended to be too large, expensive, and cumbersome.

The Institute also has an "energy systems analysis program," comprised of an Institute-constructed solar home and a laboratory in which to center its testing work. Known as Solar One and finished in 1973, the building was once used as a prototype home for the future to demonstrate the feasibility of solar heating and electricity. Now Solar One is being used as a field laboratory for demonstrating cost-effective energy systems and components for consumer use.

Tests are currently being conducted at Solar One on the Institute's thermal wall panel, air conditioning system, and the building's own pas- s solar unit. The Institute is also testing f solar water heaters side-by-side at its main headquarters.

Analysis of the data collected by Institute researchers has led the staff to conclude that a thermal wall panel the size of a patio sliding door can heat a bedroom at night and that nearly one-third of Solar One's heating requirements can be met by the sun's rays that enter through the front windows. It also believes that the Institute's air conditioning storage system, which uses off-peak electricity, has been proven through testing. Data from testing of the solar water heaters will be used to prepare consumer reports.

In the years ahead, the Institute has a number of plans for accelerating the testing and commercialization of its various research products and components: field testing of the Institute's air conditioning storage system; improving system performance and specifications on the solar water heaters; evaluating passive solar applications by examining the passive solar contribution to Solar One; and working with builders, architects, and utilities in the Mid-Atlantic region to develop passive solar design concepts and testing methods.

A number of future research and commercialization activities are planned at the Institute. To get low-cost cells out the laboratory and into the marketplace, researchers plan to build a pilot plant to demonstrate such a low-cost product line. The Institute wants to use the plant to show the feasibility of selling solar cells at a price of r less per peak watt by 1982- four years a- of and 25¢ lower than DOE's goal. The Institute strongly feels that photovoltaic systems will be demonstrated and commercialized for widespread use within five years and that it will soon reach its 1980 goal of creating a 10 percent efficient, low-cost, and thin-film solar cell.

The Institute also plans to commercialize its thermal wall panel, transfer by license its thermal energy storage technology, develop new passive solar application, and demonstrate and commercialize its storage air conditioning systems.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Public and Adult Solar Training Center
Organization	Energy Conservation & Solar Application
Address	1417 Newport Road Wilmington, DE 19804
Contact	Charles Paul
Telephone	(302) 995-6174
Funded By	DOE, HUD, Dept. of Commerce, St. Dept. of Pub. Instruc., tuition
Cost	$55,000
Congressional District	I
Compilation Date	February 1980

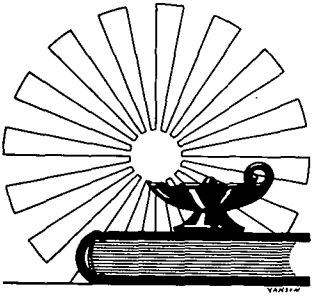
In cooperation with the Solar Energy Applications Laboratory of Colorado State University and the U.S. Department of Commerce, the New Castle County Vocational-Technical School District has organized training courses in solar applications for sizing, installing, and operating solar energy systems. A 61-hour course, incorporating 22 modules that extend from the fundamentals of solar to using computers for the sizing of systems, was the first step in what is now planned as a total energy/environmental curriculum for public and adult education. By February of 1978, 22 individuals had been certified to size, install and operate solar energy systems. Those individuals include employees of solar industries and self-employed concerned individuals.

As the program grows, course offerings have expanded. A widely acclaimed industrial arts teacher-education course was developed in the summer of 1979 and 37 vocational-educational teachers from states throughout the Union gathered at Marshallton School to learn how to train students to become solar technicians. This conference was sponsored by the Institute of Energy Conversion of the University of Delaware and the New Castle County Vocational Technical School District. It was financed by a $11,680 grant from the Department of Energy.

The teachers received "hands-on" experience installing several solar demonstration units that ranged from basic flat-plate collectors to vacuum-tube solar cooling units. They also learned how to construct heat-storage units, how to size ducts, and how to perform various plumbing tasks necessary for installing hot water systems.

The Training Center employs two full-time and six part-time personnel. Training sessions are presently held for 32 weeks of the year.

In the summer of 1981, the Center plans to offer full-time curriculum in the fields of



solar energy conservation and the environment. It will then have a new facility on the Marsh-Newmans Road in Wilmington, Delaware. The t of its kind in the nation, the Center's ıome will be developed around the concept of a living textbook. Course offerings in wind, agriculture, and forestry will be given along with the existing programs. This center will serve students throughout New Castle County on a regular basis and offer adult-training courses for individuals from across the region.

Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Solar Science Club

Organization	Caesar Rodney Jr. High Solar Science Club
Address	25 E. Camden-Wyoming Ave. Camden, DE 19934
Contact	Rob Adams
Telephone	(302) 697-3203

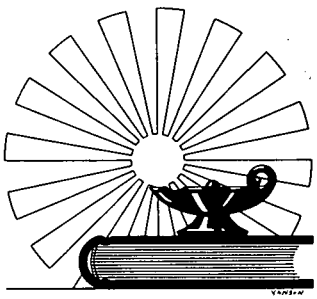
Funded By	School Student Council
Cost	$150
Congressional District	T
Compilation Date	February 1980

Since the fall of 1977, Rob Adams, an earth science teacher, has sponsored a Solar Science Club that has had 12 displays and presentations throughout the state of Delaware and Washington, D.C. The Club holds weekly meetings after school to plan and prepare for its various displays and programs. The club has designed and built many working solar projects for its weekend or after-school exhibitions, which are held at energy and solar fairs at malls, colleges, and other schools.

The Solar Science Club was awarded the Governor's Energy Awareness Award in the fall of 1978. It was also chosen to represent the educational field at the Appropriate Community Technology Fair/Conference in Washington, D.C., in April of 1979.

To describe their various projects and activities, the group has developed a slide set and video tape. In the summer of 1979, it presented its projects to the Solar Energy Institute of North America (SERNAM) in Washington, D.C. The Institute plans to take the club's display around to schools in D.C. to encourage them to start solar programs.

For the school year of 1979-80, the Club plans to continue its displays and to help the school develop its energy curriculum. They are also organizing an energy audit team, which will audit the school's energy use. This activity should help the Club members to audit homes and to help plan for home weatherization in the community. Club members plan to first weatherize their own homes, then the teachers' homes, and finally those in need in the community. They are seeking grants and donations from organizations in the community to help buy materials to weatherize homes for low-income and elderly citizens who cannot afford to do so themselves.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Terry Campus Educational Solar Activites

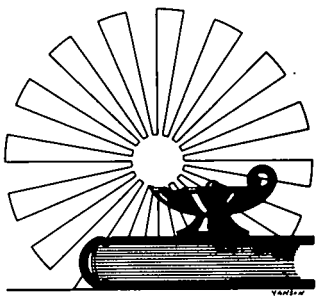
The Terry Campus of the Delaware Technical and Community College has been cooperating with Delawareans for Energy Conservation, the Delaware Solar Energy Association, and the State Energy Office in developing clinics, workshops, and curriculum courses at the Terry Campus. With the aid of Rob Adams, the energy programmer, the Campus has held two very successful solar clinics. One clinic was designed to develop an awareness of solar water heating; the other, to present an overview of do-it-yourself solar projects. The sponsors plan to continue the clinics through 1979-80.

Because the course "Introduction to Alternative Forms of Energy," was so successful, the Campus also plans to continue offering solar courses.

The Campus has been the site for the Annual Delaware Solar Project Fair, a yearly program promoting awareness of solar energy through projects designed, built, and displayed by K-12 school students.

The Terry Campus has a number of clinics and workshops planned for the fall of 1979, including: "Towards a Solar Delaware," an overview of projects in Delaware and description of Delaware solar potential; Wood Burning Safety Clinic; Conservation Through Interior Decorating; Landscaping; Insulation; Home Electricity Efficiency; Buying A Solar Hot Water Heater; Do-It-Yourself Solar Projects; Home Owners Cost Cutting Clinics. For the er of 1979-80, there are plans to add courses on the Fundamentals of Solar Heating and a solar awareness series for the public.

Organization	Delaware Technical & Community College, Terry Campus
Address	1832 North duPont Hwy. Dover, DE 19901
Contact	Earl Roberts & Rob Adams
Telephone	(302) 678-5401
Funded By	Continuing Education Department
Cost	n/a
Congressional District	I
Compilation Date	February 1980



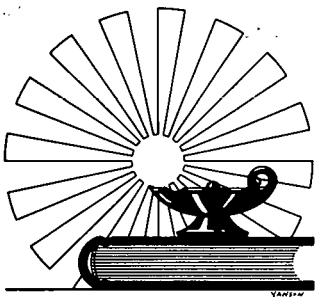
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DE
Project Name	Vo-Tech Solar Program
Organization	Kent County Vocational Technical School
Address	Woodside, DE 19980
Contact	Lou Stubbolo
Telephone	(302) 697-3255
Funded By	Kent County
Cost	n/a
Congressional District	I
Compilation Date	February 1980

For the past five years, Lou Stubbolo and his sheet-metal class have been experimenting with solar energy. Examples of products that have been produced in the class include solar ovens, solar reflectors, solar deflectors, solar hot air collectors, and both above and below-ground heat storage. The most impressive project is a passive solar window-box collector made primarily of sheet metal. The device's unique design has won several honors.

Mr. Stubbolo is now working on advanced design with plans to construct a small solar-heated building with thermal storage. He has worked hard to involve the community in the project--assembling materials with individuals from the Chamber of Commerce, the building trades, and the State Energy Advisory Board. Construction was to begin on the first experimental model before the end of 1979.

With vast experience in sheet-metal and air-movement design, Mr. Stubbolo plans to integrate solar technology principles as a standard part of his sheet-metal class curriculum.



Renewable Resources—A National Catalog of Model Projects

Category	Financing
State	DE
Project Name	Farmers Home Administration

The Farmer's Home Administration has a program that provides home loans for low and moderate-income families. For families earning up to $15,600, loans will come from the Farmer's Home Loan (FmHA). Families earning from $15,600 to $20,000 will obtain loans from the bank with a Farmer's Home Loan guarantee of 90 percent. For new homes, loans can be made up to $35,000. The average home loan for existing homes now runs between $30,000 and $31,000.

The decision for solar loans is up to each county office. However, the system to be installed must always have the prior approval of the national office.

At this time no solar loans in Delaware are being funded. Arthur Greenwood of the National Office, states that to date, there have been no cost-effective solar loan proposals presented, thus the lack of funding by FHA.

The FmHA is conducting extensive studies on solar facilities at the national level to determine their future feasibility.

Critique: FmHA has several concerns with solar energy. Some solar systems may require a lot of maintenance; old homes need to upgrade insulation before retrofitting; and new homes construction
meet high standards before a solar system can
ıstalled.

Organization	Farmers Home Administration
Address	2319 South duPont Highway, Dover DE 19901
Contact	Arthur Greenwood
Telephone	(302) 697-9581 (302) 834-3541 (302) 856-9041
Funded By	U.S. Dept. of Agriculture (USDA) (direct gov't. loans)
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Financing
State	DE
Project Name	Loans for Solar Grain Drying

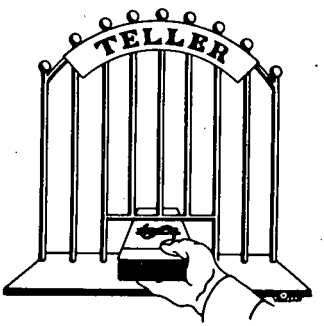
The Kent County Agricultural Service is offering loans to farmers for solar grain drying. Those applying must be an agricultural producer of corn, wheat, barley, soybeans, or another crop.

The loan ceiling is $50,000, and 85 percent of the cost of the items is the most that loans can be used to cover. The loan will be set up for eight years, with seven annual payments due in seven consecutive years. Payments will be due after the harvest season, when the farmer has most available funds to pay the loan.

The solar grain-drying loans have an annual interest rate of 10.5 percent and can be paid off in advance without penalty. A farmer can apply for the loan within 30 days of the time the items to be financed are delivered to the farm.

Loans are granted to farmers who plan to purchase new grain-drying equipment or who want to build their own solar facility. A loan will not be granted to a farmer who plans to use the solar equipment for commercial purposes.

Organization	Kent County Agricultural and Conservation Stabilization Service
Address	Kent County ACSS 2319 South de Pont Hwy Dover, Delaware 19901
Contact	Lester Hall
Telephone	(302) 697-3179
Funded By	U.S. Dept. of Agriculture - Commodity Credit Corp.
Cost	$50,000 per farmer (85% of cost)
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

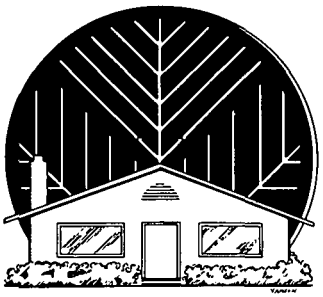
Category	Housing
State	DE
Project Name	Demonstration Multi-purpose Passive System
Organization	William Ireland, Jr.
Address	406 North DuPont Hwy. Georgetown, DE 19947
Contact	William Ireland, Jr.
Telephone	(302) 865-7880
Funded By	Private; Dept. of Energy ($7,600)
Cost	$9-$10,000 (private) $7,600 (DOE)
Congressional District	I
Compilation Date	February 1980

The Irelands have been working on their solar home for nearly five years. They first installed a single, then a double, clear plastic wall that closed off the south side of the patio at the back of their building. Since then they have been investigating the practicality and the various ways of replacing heating fuel with solar power.

The success of its first project encouraged the family to enlarge the system to cover the flat roof of the patio and garage. This solar room rests on a one-story concrete block addition at the rear of a two-story concrete-block main building. It is joined to the concrete base of the one-story section with bolted columns and steel tie-down straps.

The addition is 48 feet long, 21 feet wide, and 13 feet high at the peak. The long axis is almost exactly east and west. The south and east sides of the room are made of clear plastic. The north-sloping roof, north wall, and a portion of the floor over an unheated storage area are heavily insulated. The west side is the wall of the main building. All interior wood is stained brown to aid in heat absorption.

A door on the west wall with a transom over it provides the entrance to the ng quarters on the second floor. Hot enters the living quarters through transom and cold air returns down an interior stairway at the rear of the building, out the back door, across the enclosed patio, up the stairs from the patio, and into the solar room. With partial success, parachute fabric is now used for curtains on the south side to stop re-radiation at night and to prevent unwanted heat on warm days.



As a heat trap, this solar room is phenomenonally successful. Temperatures on bright days quickly soar to 110-120 degrees F. Unfortunately, the system is not under control. Making the solar room habitable during all kinds of weather--not just during the night or on cloudy days--remains a problem.

Avoiding the use of any active components like blowers or fans, the Irelands want to keep their solar home simple to minimize systemic failures. At the least, the Irelands want to know that their system is simple enough for any good "country mechanic" to be able to correct the problem.

With fuel oil at 75¢ per gallon, Mr. Ireland expects his $9-10,000 system to pay for itself in seven to eight years. With energy prices escalating so quickly, the payback could be much shorter. In addition, the Irelands expect to reduce their need for oil by one-third or more.

Odd-shaped and located on a busy highway near a popular supermarket, the Ireland's solar demonstration project is noticed by a large number of people. Strangers and friends alike ask to be shown the system, and a number of area building contractors who are considering entering the solar market have visited the site.

Funded by a DOE Appropriate Technology Grant, Mr. Ireland plans to continue developing his system and experimenting with it. He would like to tackle his worst problem, lack of an adequate heat-storage system, and add suitable curtains. He also wants to install devices for measuring solar gain and energy usage. These tasks should be completed within the next year, after which the Irelands plan to install a solar hot water system.

Renewable Resources—A National Catalog of Model Projects

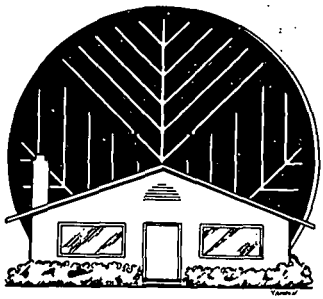
Category	Housing
State	DE
Project Name	Homebuilt - Low Cost Solar Hot Water System

Rod Stummal has built a unique solar water heater that he believes will pay for itself in three years. Rod built the system in about 40 hours for approximately $300, and he estimates that it is saving him on an average of $12 to $14 monthly for his family of three.

The system heats 80 gallons of water to temperatures averaging 125 degrees - 130 degrees F in the winter and 150 degrees - 155 degrees F in the summer. The system resembles a cylindrical capsule standing at a 45 degree angle to the ground with aluminum wings on either side of the capsule. Inside the capsule is an 80-gallon tank insulated to R-22 on the backside. The tank is painted black to absorb the direct solar radiation. The front of the capsule is covered with two sheets of glazing. The system sits in his year, facing due south.

Mr. Stummal believes the system works extremely well.

Organization	Rod Stummal
Address	R.D. 2, P.O. Box 777 Smyrna, DE 19977
Contact	Rod Stummal
Telephone	(302) 653-7725
Funded By	Private
Cost	$850 (commercial unit) $300 (owner-built unit)
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

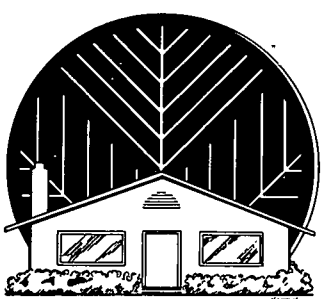
Category	Housing
State	DE
Project Name	Multi-family Solar Development
Organization	Tree Top Solar Townhouses
Address	Henderson Hill Road Pike Creek Valley Newark, DE 19711
Contact	Marta-Walkers Builders
Telephone	(302) 737-8887
Funded By	Private
Cost	$61,000-solar space heated; $57,000-solar domestic hot water syste
Congressional District	I
Compilation Date	February 1980

This solar development constitutes Delaware's first energy-efficient community. The 21 solar townhouses are designed and constructed to save energy dollars using double-glazed windows and high R-rated insulation. Seven of the homes include solar space-heating and hot water systems. Fourteen other homes include solar domestic hot water systems.

It is expected that the homes incorporating both solar space-and water-heating systems will provide at least 65 percent of the space heating and 65 percent of the domestic hot water. An oversized air duct system allows a high volume of air to circulate at a slow air flow.

It is also expected that the combined solar space and domestic hot water systems will pay for themselves in seven years at 1978-79 fuel prices with 10 percent projected inflation. At the escalating oil prices of today, however, it may take only four years to recapture the initial investment.

As an example, one 2000 square foot home was heated for $197.00, with a total energy bill of $500. For a comparable non-solar home, the total energy costs were about $1,300.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	DE
Project Name	Passively Cooled and Heated Home

In the early 1950's an old apple-packing barn was converted into a residence by Colonel Harold Rau, a World War II Dover Air Force Base commander. Although the barn was not deliberately remodeled to be a passive solar home, it largely turned out to be just that.

Colonel Rau wanted to give the residence the feeling of openness. He added four 4' x 6' thermophane windows along with one 4'x 6' sliding glass thermopane door to the southern wall. To the north wall, also using thermopane, he added two 4' x 6' windows along with a 4' x 6' sliding door. He also added large thermopane picture windows on the east and west sides.

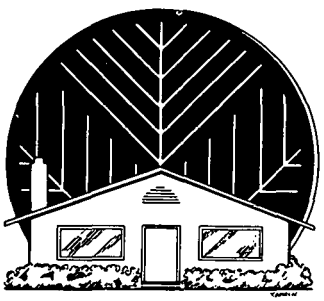
When Dr. and Mrs. Keith Hamilton bought the residence in 1972, they finished off the upstairs with old barn wood from two old barns in Milford. Liking the openness of the downstairs, they decided to do the same upstairs, adding two 4' x 6' thermopane sliding glass doors on the south and north sides.

Although the Hamiltons like the spaciousness, the price of the openness is great heat loss on the north, west, and east walls.

By opening the windows in the upper floor on both the north and south sides, the Hamiltons find that they draw the warm air from the lower floor, creating a cooling affect. The natural ventilation allows the home to be comfortable through the summer until mid-August. During this p of August, when the heat and humidity bec xtremely high, they close the windows and drapes and turn on the air conditioner.

Organization	Dr. & Mrs. Keith Hamilton
Address	35 North Fairfield Dr. Dover, DE 19901
Contact	Dr. & Mrs. Keith Hamilton
Telephone	(302) 674-2420

Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	DE
Project Name	Passive Space Heating & Homemade Active DHW Solar Systems
Organization	Peter Casper
Address	Huntly Circle, Dover, DE 19901
Contact	Peter Casper
Telephone	(302) 734-3739
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Twenty-five years ago the Caspers bought a $22,000 prefabricated 1,400 ft^2 home whose thermopane windows covered most of one wall. When they assembled the home, they oriented this wall to the south, knowing that this would allow them to use the sun during the day to assist in heating the structure. But, while they could use the sun to passively solar heat their house, the structure came with only two inches of fiberglass in the walls and four inches in the ceiling. Even so they can solar heat their home to between 80 degrees and 90 degrees F on a sunny winter day, venting out excess heat as needed, even in the wintertime. With the use of a roof overhang, they can largely block out the hot sun in the summer.

Before the energy crunch, the Caspers used an average of 1,000 gallons of fuel oil per winter. Since the oil embargo in the winter of 1973-74, however, they have averaged only about 700 gallons. This was primarily accomplished by closing off unused rooms, setting the thermostat at 68 degrees F in the day and 60 degrees F at night, and relying on the passive solar features.

As a result of attending a three-day symposium on the "Limitation of Growth" at the Swathmore Alumni College, his alma mater, Mr. Casper built a small 30 ft^2 single collector solar heating system six years ago to assist his existing oil heating system.

The collector had a single glazing of glass and used a 250-gallon water storage. The rage containers were 55-gallon paper ns lined with plastic bags. Mr. Casper used an old air conditioner condenser for a heat exchanger and his existing oil furnace blower system to distribute the heat to the house at night.

With one long 30 ft^2 panel, Mr. Casper found that when the water was not circulating to collect heat, the system would freeze instead of draining. This, along with his feeling that the system was too small to really help heat the house, lead Mr. Casper to decide, after three years of using his $800 system, to convert it to a domestic solar hot water heater.

Mr. Casper now has a 50 ft^2 two-collector domestic solar hot water system. The panels have a single glazing of plastic, identical to the material used for storm windows. A 50-gallon storage tank is used with 200 feet of coiled ½ inch copper tubing (as a heat exchanger) which is connected to a 40-gallon electric hot water heater. The 200-foot coil is connected as four 50-foot sections to cut down friction loss in the system. A 1/12 horsepower high head pump is used to pump the water through the system. When there is a 20 degree F differential between a heat sensor at the top of the end solar collector on the roof and the bottom of the storage tank, the pump kicks on to circulate water through the system to be heated. When the temperature of the water in the bottom of the storage is higher than that of the water ng from the collector, the pump stops and the system drains down.

Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	DE
Project Name	Federal Solar Building

C. M. Weymouth of the American Institute of Architecture (AIA) designed and developed a model solar building for the Department of Natural Resources and Environmental Control in 1975. The building was to have been built under a 2.5 million grant from the Department of Energy with matching funds from the State.

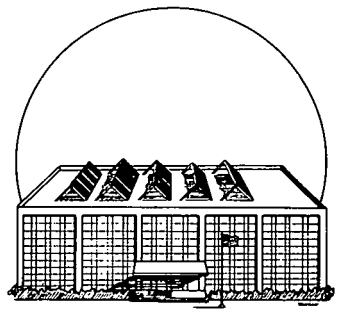
The basic design of the building would have allowed for 40 percent of the heating to be derived from solar energy. As an energy-conservation measure, the structure was to incorporate earth berming on the north side.

The structure has been relocated to an industrial park. DOE funding was not granted. The project is presently waiting for $3.1 million in state bonds to be granted in June of 1980.

Weymouth is not optimistic about the funding. The building, in its new location, will not serve as an educational display, and so may not be considered by the state as a beneficial investment.

C. M. Weymouth is involved in many projects in Delaware that incorporate conservation measures. The firm continues to research the use of passive solar gain through building orientation.

Organization	C. M. Weymouth, AIA
Address	913 Washington St., Wilmington, DE
Contact	Charlie Weymouth or Lee Sparks
Telephone	(302) 658-8760
Funded By	DOE
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	DE
Project Name	Hybrid System for Space & Pool Heating

In August of 1979, the Wilmington Swim School completed a major remodeling of its facility, including both active and passive solar heating systems.

The active heating system is a drain-back flat-plate collector system. The massive 2,500 square foot collector has a storage capacity of 2,800 gallons in an insulated concrete tank. It is hoped that the active system will meet 67.4 percent of the new spacing-heating requirements, and 18 percent of the pool-heating requirements. The Swim School will use an existing gas furnace as a back-up system.

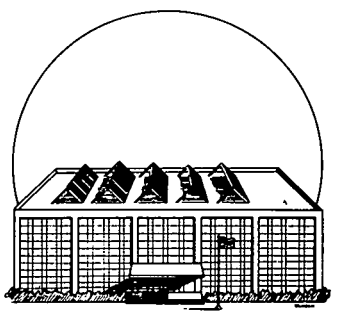
The solar system is designed primarily for space heating with the overload going first to domestic hot water and finally to pool heating. The system is designed to use all energy collected the year round. Load decisions are derived from a micro-processor unit.

The passive system considered a low technology collector was job-fabricated using standard building materials. Integrated into the south-facing wall, the collector is used to pre-warm fresh air flowing through the return air duct to one of the air-handling units in the heating system. The collector is constructed of a single glazing material. There is a 1.5 air space between a selective surfaced corrugated aluminum panel and the insulated framed wall of the building. The system is designed so that summer heat is directed to the outer atmosphere.

It is estimated that the passive and active solar systems will save a minimum of $4,000 per year, using an estimate based on the price of natural gas at $3.79 per million cubic feet. This price, of course, is expected to continue to escalate in the coming years.

This system will be monitored for five years by the U.S. Department of Energy.

Organization	Wilmington Swim School
Address	2150 New Castle Ave. New Castle, DE 19720
Contact	Dr. Haubein
Telephone	(302) 655-5501
Funded By	DOE; Wilmington Swim School
Cost	$124,158
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

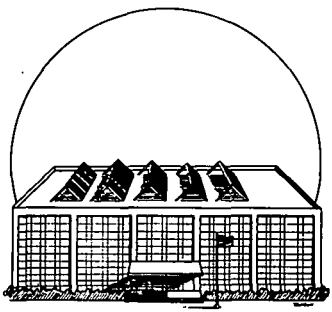
Category	Institutional
State	DE
Project Name	VA Solar Demonstration Building and Energy Bank
Organization	VA Hospital and Nursing Home
Address	1602 Kirkwood Highway Wilmington, DE 19805
Contact	Jim Holmes
Telephone	(302) 994-2511 ext. 276
Funded By	VA Energy Project Department
Cost	$947,000
Congressional District	I
Compilation Date	February 1980

An existing research building at the Veterans Administration (VA) hospital in Wilmington, Delaware, was chosen as the first solar demonstration project for the Veterans Administration. Since the building is typical of other research buildings in the VA system of 172 hospitals, operating data on the solar system in this facility will be of use in determining the feasibility of retrofitting other VA buildings.

The Wilmington VA hospital was well suited to a solar retrofit project. The two-story structure, constructed in the early 1970s, and contains about 10,000 square feet of space. A high energy user, the building was structurally, aesthetically, and architecturally suited to the addition of solar panel arrays. An adjacent one-story building provided additional rooftop space for collectors. And, in addition, both buildings were oriented just a few degrees of due south, with the long axis in an east-west direction. The VA also controlled all sun rights for the building, and no objects obstructed the path of sunlight.

The VA solar system consists of a 5,000 square-foot array of collectors that are double glazed with selectively coated copper absorber plates mounted at an angle of 40 degrees. A reflector, mounted at a 30-degree angle, increases the solar water temperature in the summer, while a hot water coil provides winter heating. Other features of the system include a 12,000-gallon storage tank, an absorption chiller to provide summer cooling, and a data-recording system. It is estimated that the system could provide up to 60 percent of the calculated heating and cooling requirements of the structure.

At the Veterans Administration Nursing Home, a unique solar-assisted heat-pump system was installed in May of 1976. Commonly referred to as the "energy bank," this system is used to heat and cool a 60-bed care unit in a nursing home. The 40' x 50' structure contains a solar collector/



nocturnal radiator, an evaporator/condenser unit, refrigeration equipment for the heat-pump cycle, and an ice-builder tank for thermal storage. This system, the Annual Cycle Energy System (ACES), employs equipment commonly used in commercial buildings, but it has two very important advantages over such equipment.

First, ACES conserves energy through timely s to numerous modes of operation--five for heating and three for cooling. Of the eight modes, the first is primarily an air source heat pump. When outdoor air temperatures drop below 40 degrees F, a second mode allows heat to be extracted from a brine cooler instead of outdoor air. (The brine is an ERDA-recommended solution of 30 percent methyl alcohol.) The third mode incorporates 1,500 square fee of unglazed solar collectors to heat the brine, which melts the ice in the ice tank and helps heat the building. With a volume of 20,000 square feet, the ice tank contains 127,160 gallons of water with 12,500 feet of 1.25-inch piping coils spaced 13 inches apart. The fourth mode involves recycling heat from lights and equipment in the building.

Mode five, for cooling, uses all of the ice developed during the winter while producing heat for the nursing home. It satisfies the building's requirements for the first two months of the cooling season. The sixth mode resembles a conventional refrigeration cycle. Heat is rejected in this system at night through the nocturnal radiator/solar collectors that were used to collect heat in the third mode. Mode seven involves freezing ice in the ice tank during off-peak electrical hours. The eighth mode uses the unglazed solar collector to collect free solar heat and transport it through the brine to the ice tank. In the coils of the ice tank, the heat melts the ice, thereby storing solar heat for future use. When more heat is developed than the nursing home needs, the excess is rejected t' - gh the ice tank coils and sent to storage.

\CES's other advantage is that it allows for load management by using electrical power during off-peak periods.

The energy bank's safety, operation, and instrumentation are automatically controlled. Data is collected through a mini-computer, and life-cycle costs will be determined to aid others who may consider using a similar system. The Veterans Administration believes that this system offers a viable alternative to today's conventional systems.

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	DE
Project Name	Delaware Solar Energy Tax Credit

By adding a section to the Delaware Code, the Delaware State Legislature has made it possible for residents of the state to get a tax credit of up to $200 for the installation of a solar energy system.

The Delaware Solar Energy Tax Credit (HB 475), allows a $200 credit for the purchase of a solar energy system. The credit covers installation charges for solar energy devices designed to produce domestic hot water on locations in Delaware that are owned and controlled by a Delaware taxpayer at the time of installation.

To get the tax credit, the owner of the solar energy system must have paid for the system during the taxable year. In the case of a husband and wife who file separately, each should claim a credit of $100.

This solar tax credit applies only toward energy devices approved by the HUD Intermediate Medium Property Standards for domestic hot water systems (NBSIR 77 - 1226 of March 19, 1977). (To obtain information about solar dealers and distributors in the state, residents should contact the Delaware Energy Office by calling their toll-free number 1-800-282-8616).

Organization	Delaware State Legislature
Address	Legislative Hall Legislative Avenue Dover, DE 19901
Contact	n/a
Telephone	(302) 678-4114
Funded By	State of Delaware
Cost	Up to $200 per individual or family
Congressional District	I
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

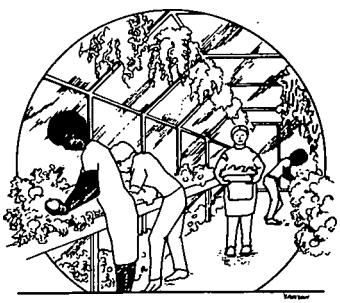
Category	Low Income
State	DE
Project Name	Blades Community Solar Program

The Blades Community Development Program's solar/conservation project demonstrates to people in the community and county how low-cost passive solar can be used to heat homes. The program has brought in many local schoolchildren to tour the demonstration building, which contains a solar window-heating box and a vertical solar window unit. These children have also been instructed as to what they can do in their homes to save energy, and they have given information on solar and conservation.

No dollar value has been placed on the energy savings, but some records have been kept. The 12' x 24' room was heated from October 1, 1978 to February 19 of 1979 with solar energy backed up by an oil system (which was used less than five whole days). And while the morning temperature of the room never dipped below 62°F, by 9 a.m. on a sunny day the room temperature reached 72°F. The panel continued to heat the room until between 3:30 and 4:00 p.m., with the panel averaging 105°F at mid-day and sometimes reaching 120°F on peak days.

Besides the solar window box, a vertical window unit has been installed in the window of the building's conference room. The room measures 18' x 27', with an eight foot ceiling. The vertical window unit has been constructed for use as a heater for the winter, and a low-intensity convection circulator for the warmer r months. Plans for both units are avail- by writing the Blades Community Development am.

Organization	Blades Community Development Program
Address	Box 691 Blades, DE 19973
Contact	Carol Crouse or Cliff Laverty
Telephone	(302) 629-7329
Funded By	Labor and materials donated
Cost	$400-Labor (estimates) $200-Materials (estimates
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	DE
Project Name	The 811 House

Organization	Community Action of Greater Wilmington
Address	1103 North Madison Wilmington, DE 19801
Contact	James Baker or Robert Calbazana
Telephone	(302) 571-0538

Funded By	Community Development Corp., Wilmington Housing Corp.
Cost	$90,000
Congressional District	I
Compilation Date	February 1980

Community Action of Greater Wilmington (CAGW) has taken responsibility for redeveloping a run-down block of abandoned houses near central Wilmington. The goal is to apply accessible and existing technology (primarily soft technology) to improve the community's quality of life. At the same time, CAGW wants to use community people to build and service their projects, thereby boosting the local economy.

The first project of CAGW was to retrofit a 120-year old building (known as the 811 House) with a trombe wall for heating and cooling and with various conservation measures that produce a "thermos bottle" effect, or heavily insulated capsule. It is anticipated that the house will use only 1,200 gallons of oil during the current heating season, compared with the 4,000 gallons it used each season before the system was installed. Thanks in part to the Institute of Energy Conversion at the University of Delaware, this system is believed to be at least 77 percent energy efficient, 50 percent more efficient than the standard home.

A Trombe (glass-covered) wall thermo-siphoning concept has been utilized on the south-facing wall of the 811 House. Cool air enters the bottom of the wall from the house and heats as it rises in front of the wall. The newly heated air then enters the house by convection and is distributed throughout the house by a duct system. The low winter sun will strike directly where as the higher summer sun will be blocked out by sun shades built into the wall. Heat collects in the wall in the summer and flows out the top of the panel to the outside. The duct system also draws cool air through the house from the basement. Combined, these two measures should keep the house 10 to 12° F cooler than the outside.

Community Action of Greater Wilmington has a number of other solar/conservation programs planned for the next five years. During the summer of 1980, CAGW is planning to retrofit 20 houses with energy-conservation and solar-heating devices. The cost of each home is anticipated to be about $35,000. If the program is successful, it will lower the energy costs of each home so that overall operational costs will be affordable to low-income people.

The CAGW also plans to build 350 HUD-approved homes, using workers from the neighborhood Job Skills Center to do the construction. CAGW staff member Bob Calbazana hopes the projects will lead to a complete transformation of the east side of Wilmington in the next two- to five years.

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	DE
Project Name	Group Home for the Elderly

Organization	Sussex County Community Action Agency, Inc. (SCCAA)
Address	Route 113 Georgetown, DE 19947
Contact	Jack Vogel
Telephone	(302) 856-7311

Funded By	HUD, DOE Appropriate Technology Small Grants, Sussex County
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The Sussex County Community Action Agency, Inc., (SCCAA) has proposed to rehabilitate a vacant nursing home in Laurel into a group home for low-income elderly. This home will accommodate 12 senior citizens who would otherwise be housed in substandard or overcrowded housing, cosigned to institutional care, or lodged in an otherwise unsatisfactory manner.

Funding for this project is limited and rent will be partially determined by operating costs. Projected heating oil costs, based on data supplied by the dealer who previously served the nursing home, are estimated to range from $5,000 to $7,000 annually. Solar assistance in heating the building is expected to greatly reduce fuel bills and, consequently, the rental costs.

The building involved is a large stone two-story structure with a full basement and an attic that can be used for expansion or group activities. The orientation of the building is to the southeast. A 9' wide cement floor porch encircles the house on the west, south, and east sides.

The Institute of Energy Conversion of the University of Delaware has agreed to help monitor the attached hybrid passive solar energy system that will incorporate and exploit existing features of the building: the porch, the orientation, and stone walls. Researchers at the Institute conclude that a well-designed and well-built glass enclosure attached to the south-facing porch will create a sun room with a greenhouse effect. This will heat both the room and the stone wall and help to reduce substantially the heating costs of the building.

SCCAA has been awarded $30,000 from HUD toward rehabilitation of the interior of the building and $14,660 from the DOE Appropriate Technology Small Grant Program for the Solar retrofit.

SCCAA has also received $20,000 in funds from the Sussex County Council to develop an educational program. The six-month program will incorporate training in alternative forms of energy along with the construction of eight solar wall heaters that will be installed in homes of the economically disadvantaged at Coverdale Crossroads.

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	DE
Project Name	Low-Income Solar Housing

NCALL Research of Dover is providing technical assistance for People For Better Housing, Inc., for a low-income rental housing program in Federalsburg, Maryland. The project consists of 40 rental townhouses with one, to four bedrooms each. Twenty of these units will contain solar domestic hot water systems. All will be built with an energy efficiency package for windows, insulation, and other conservation measures, along with a heat pump system for space heating. Renters will apply 25 percent of their income toward rent and utilities with the federal government picking up the rest of the cost to pay back the 50-year loan to Farmers Home Administration.

Critique/analysis: This project should provide data to assist in evaluating the worth of solar domestic hot water systems as they apply to low-income housing. In addition, the information gained from the program should help Farmers Home Administration award solar loans.

Organization	NCALL Research
Address	155 South Bradford St. Dover, DE 19901
Contact	Joe Myer
Telephone	(302) 678-8522
Funded By	Farmers Home Administration
Cost	$1,271,000 total project $44,000 solar equipment
Congressional District	I
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	DE
Project Name	Delawareans for Energy Conservation

Organization	Delawareans for Energy Conservation (DEC)
Address	20 Perth Drive Wilmington, DE 19803
Contact	Paul Hauser
Telephone	(302) 478-3582

Funded By	Memberships, dues, and grants
Cost	n/a
Congressional District	I
Compilation Date	Feburary 1980

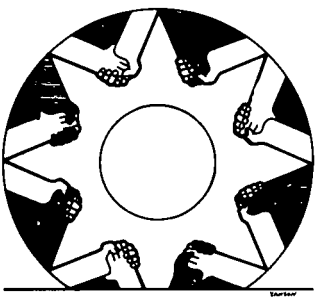
The Delawareans for Energy Conservation (DEC) is a state-wide citizen's organization whose goal is to implement energy-conserving practices throughout the state and to create a state network involving other concerned state organizations. DEC was founded November 21, 1975 by Delaware representatives attending an Energy Conservation Training Institute meeting held at Berkeley Springs, West Virginia. The Institute was sponsored by the Conservation Foundation under contract to the Federal Energy Administration.

DEC's program is aimed primarily at heightening public awareness. It involves encouraging public and private schools to teach solar energy and conservation in their curriculums. To aid in this effort, DEC has developed and distributed an energy curriculum, as well as conducted teacher-education sessions.

DEC also urges local governments to set an example in their energy use and lobbies actively for energy-conservation legislation. The organization is involved in improving Delaware's transportation system, addressing utility concerns, and influencing business and industry's conservation policies.

DEC-sponsored programs to date include "Global Energy Policy: Who Decides?" funded by a grant from the Delaward Humanities forum, a series of energy forum, "Energy Today" activities and displays, solar energy fairs, a slide pro- and talk entitled "The Energy Story," (co-ored by the League of Women Voters) solar nome tours, and Sun Day activiities, exhibits, programs, and tours.

DEC has also held a number of workshops; "Determining Delaware's Energy Policy--What Role Can We Play?" which was a state-wide energy conservation workshop held May 1, 1976; and "Solar Assessment Conferences" held in the summer and fall of 1978 with a grant from the Department of Energy through Solar Action.



DEC has written and produced several publications over the last four years. It publishes: "DEC Reporter"; "Solar Flyer"; "It Makes Sense to Save Energy"; Vale La Pena Conservar La Energia," a bi-lingual energy conservation book; "Energy Savings Checklist for Your New Home"; and a curriculum for the schools entitled "Energy: Here Today, Tomorrow".

Other DEC educational programs include a teacher energy-education course at the University of Delaware, a state-wide solar science fair for the public schools, teacher in-service workshops, slide presentations, collaboration in setting up teacher workshops with the Department of Public Instruction; and curriculum development.

At present, DEC has an active Solar Committee that meets at the county level to create public awareness of solar energy. In New Castle County, meetings are held with the Delaware Solar Energy Association at the Wilmington campus of Delaware Technical and Community College. In Kent County, meetings are arranged as public workshops and clinics at the Terry Campus of Delaware Technical and Community College. In Sussex County, special programs are arranged for the public at the Georgetown Campus of Delaware Technical and Community College.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	DE
Project Name	Delaware Solar Energy Association

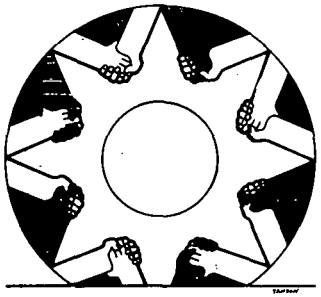
In January of 1979, the first organizational meeting was held to consider the formation of a subchapter of the Mid-Atlantic Solar Energy Association (MASEA). With many architects, solar dealers, engineers, teachers, and interested citizens from which to draw, by March of 1979 the subchapter had been formed.

The goals of the Delaware Solar Energy Association (DSEA) are to promote the development and application of those renewable energy sources and energy-management techniques that are harmonious with long-range ecological stability. In addition, the DSEA seeks to inform the public of the economic, social, and ecological advantages of these systems.

Working in cooperation with the Solar Committee of the Delawareans for Energy Conservation (DEC), another solar/conservation citizen group in the state, DSEA and DEC organize meetings, produce publications, present displays, and hold clinics. With each activity, they try to raise the solar awareness of the public, government bodies, and a variety of other institutions in the state.

Organization	Delaware Solar Energy Association
Address	Route 3, Box 289K Oxford, PA 19363
Contact	Kent Vendrick
Telephone	(302) 731-0990

Funded By	Membership Dues
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

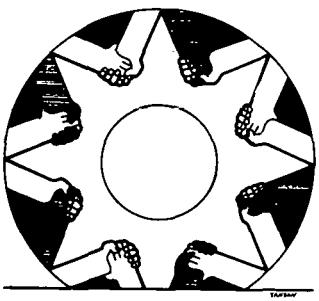
Category	Outreach
State	DE
Project Name	IEC's Energy Information Service
Organization	Institute of Energy Conversion
Address	University of Delaware 1 Pike Creek Center Wilmington, DE 19808
Contact	Fraser Russell, Dir. Peggy Stallings
Telephone	(302) 995-7155
Funded By	Government grants; Private industries
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The Institute of Energy Conversion at the University of Delaware has an active research testing and development program in photovoltaics, energy storage systems, passive solar applications, and solar hot water heaters. (See description elsewhere in this catalog.) For its research to be meaningful, however, the Institute's management believes that the technology must be taken out of the laboratory and into the marketplace. Consequently, the Institute staff has developed an information dissemination program focused on solar energy and energy conservation. Known as the Energy Information Service, this program attempts to link developers of energy technology with energy consumers.

Established in 1977, the Energy Information Service (EIS) organizes seminars and workshops; maintains a speaker's bureau; manages tours of its solar demonstration home, laboratory, and Solar One; provides literature and answers specific inquiries on energy topics; and works with other academic departments to develop courses. A key part of the program has also been Project Conserve, a computer-based individualized analysis for single-family residences in Delaware.

The Energy Information Service responds annually to over 27,000 inquires and conducts tours of Solar One each month for 500 people. It has given over 150 presentations to educational, civic, and professional groups, and has helped execute several academic courses and public seminars.

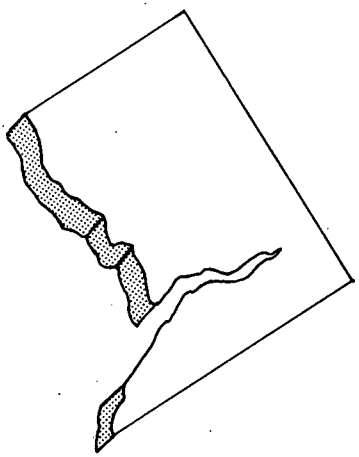
In the Project Conserve program, the Energy Information Service supplied energy-conservation advice to more than 14,000 Delaware residents (over 10 percent of all single-family homes in the state). A follow-up survey of the results of this computer-based energy program revealed that 68 percent of the survey respondents had either implemented some of the recommended energy measures or intended to do so by the



winter of 1978.

The information Service is currently expanding its efforts in workshop design and implementation and in the future intends to continue to offer energy audit services in conjunction with conservation workshops. The Institute has also begun working in the international sphere and is cooperating with two South American countries to provide planning and educational programs in renewable energy technology.

DISTRICT OF COLUMBIA



WASHINGTON, D. C.

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Renewable Resources—A National Catalog of Model Projects

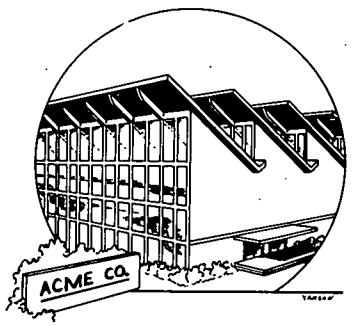
Category	Commercial
State	DC
Project Name	Eastern Liberty Federal Bank

This five-story building was designed to accommodate a liquid solar collector system that provides for space heating, cooling and hot water. The 90 collectors are made of plate glass and circulate a 50/50 water/glycol fluid. The system has a water-to-air heat pump for space heating and cooling, and a heat exchanger for the hot water with a 5,000-gallon storage tank. It is estimated that savings on hot water are 30 percent.

The building, designed to be energy efficient, has double-panel glass on all its windows. There is no back-up heating for floors one to four, since the circulating fluid in the walls and natural convection make it unnecessary. The basement and fifth floor do use an electric heater for back-up assistance.

Critique/analysis: The engineer said that maintenance requires little more than cleaning the glass plates and that no complaints have been received on the system's performance.

Organization	Eastern Liberty Federal Bank
Address	600 Penn. Ave., S.E. Washington, D.C. 20003
Contact	Mr. Estep Building Manager
Telephone	(202) 544-6800
Funded By	Private
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	DC
Project Name	Hogate's Seafood Restaurant

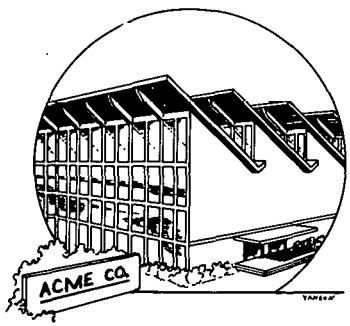
Organization	Hogate's Seafood Restaurant
Address	9th St. & Maine Ave., S.W. Washington, D.C. 20024
Contact	Joe Walmuth or Tom Poter
Telephone	(202) 897-9000

In 1977, the Marriot Corporation and DOE jointly provided funding for the installation of a domestic hot water-heater on Hogate's restaurant.

The system is comprised of 4,000 square feet of collectors, two 5,000-gallon storage tanks, and a glycol antifreeze solution. It has a gas-fired boiler for a back-up system, and it supplies 60% of the 11,000 gallons of hot water used daily.

Critique/analysis: Since DOE funded this installation as part of a cost-efficiency study, it initially used inexpensive expansion compensators. Although they worked without a problem for 1.5 years, they are now experiencing some failures.

Funded By	DOE & Marriot Corp.
Cost	$300,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	DC
Project Name	Alcohol Fuel Plant

With a $9,000 grant from NCAT and technical assistance provided by the Institute for Local Self Reliance, NUV 1*, a community outreach organization, is in the process of developing a model for an alcohol fuel plant. Local supermarkets and produce centers have been contacted by NUV 1 for vegetable and plant-waste donations.

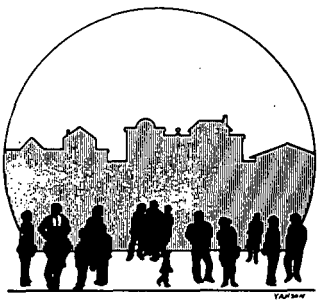
NUV 1 views this project as a tool for neighborhood development. It will be combined with other community projects to provide jobs, education, and economic support for the neighborhood.

The group plans to convert a building on its property to a passive solar greenhouse.

Critique/analysis: At present, a supervisor is still needed to direct model design and construction of the alcohol fuel project.

* NUV 1 signifies the four streets (North Capital, U, V and First) that bound the organization's office and three-quarter-acre plot of land in downtown Washington, DC.

Organization	NUV 1
Address	38 V St., N.W. Washington, D.C. 20001
Contact	Rick Sowell
Telephone	(202) 387-7990
Funded By	Natl. Ctr. for Appropriate Technology
Cost	$9,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	DC
Project Name	Anacostia Energy Alliance
Organization	Anacostia Energy Alliance (AEA)
Address	2027 Martin Luther King, Jr. Ave., S.E. Washington, D.C. 20020
Contact	David Cawley
Telephone	(202) 889-7932
Funded By	United Planning Organization, D.C. Energy Unit, & HUD
Cost	$21,000 (workshops) $50,000 (audit program)
Congressional District	I
Compilation Date	February 1980

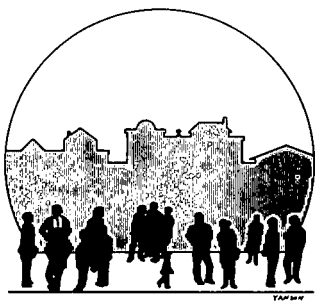
Conceived by the Institute for Local Self-Reliance, the Anacostia Energy Alliance was created to provide technical assistance and to act as a catalyst in neighborhood energy and economic-development planning. It is the first stage in a three- to five-year project whose long-term goal is to educate residents to formulate and implement a neighborhood energy plan.

The AEA at present serves as an information center offering free energy audits and a conservation/solar energy workshop series.

The energy audits are performed by recruits from the local manpower bank who have studied building construction and materials, heat transfer, heating and cooling mechanical systems, utility issues and bills, and renewable resource technologies.

The audit itself is done by six staff members who work in five areas: window, wall and doors; residential solar potential; mechanical systems; appliances; and resident interviews. The crews obtain measurements and conditions of these various components to determine R values of building materials, service-combustion efficiency, and types and frequency of energy use. The resulting information is computer analyzed and compared with the resident's actual energy bills. Using this comparison, the staff determines and prioritizes energy-conservation strategies and then reports back to the resident.

Audit participants are offered a 30 percent discount on the AEA workshops and a 10 percent discount at local businesses for storm windows and insulation. They also receive a directory of related community services, the Consumer Bill of Rights, a list of local contractors, information on tax credits and DOE's "Tips for Energy Savers."



At the weekend workshops, information on insulation, weatherization, and solar energy is distributed, and a domestic hot water col- l[illegible] is constructed. The purpose of the w[illegible]ops is to educate participants in energy i[illegible], technical skills, and self-reliance.

Long range plans of the AEA are to establish a community-based Board of Directors who will eventually take over directorship of the Alliance and provide for its community management.

Critique/analysis: As a result of AEA's success, the D.C. Energy Office plans to expand the program into two other neighborhoods and to increase the program services.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DC
Project Name	ACT '79

The most comprehensive gathering of appropriate technologists in this region, ACT '79 was planned by more than 200 individuals and organizations from the mid-Atlantic states, and involved more than 300 exhibitors and 1,000 speakers. Simulating a model appropriate technology community complete with shops, houses, businesses, farms, schools, etc., ACT '79 exemplified a self-reliant, environmentally clean, and democratically governed community. Within this model, learning was enhanced by teaching, skill-sharing, and discussions. Part of the purpose of ACT '79 was to stimulate new appropriate technology programs in the region, serve as a prototype program for other regions, and introduce appropriate technology to decision-makers in the federal government.

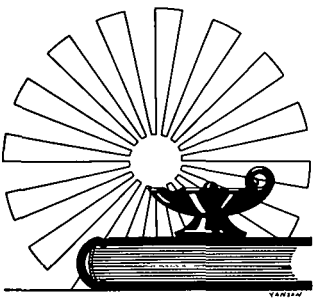
The fair dealt with appropriate technology related to energy, food and agriculture, land use and conservation, and transportation.

Energy: ACT'79 presented the energy options of methane gas, alcohol fuels, wind technologies, low-head hydroelectric and solar, through displays and demonstrations. These exhibits illustrated such processes as recycling wastes, solar crop drying and photovoltaics as applicable to transportation, home heating, and electrical generation. How-to-do-it workshops afforded visitors familiarity with community organizing and networking. Choosing and using insulation, purchasing alternative equipment, and weatherizing the home were subjects that were also stressed. The fair hoped to be energy-self-sufficient.

Food and Agriculture: The rural community in ACT '79 had farmhouses, barns, shops, livestock, crops, and communal kitchens. They demonstrated food preparations and preservation, government-nutrition programs, animal-buying and caretaking, tool use, fish farms, mulches, tree cultivation, drip irrigation, farm management, cooperatives, and urban food production.

Organization	ACT '79
Address	3000 Connecticut Ave., N.W. Washington, D.C. 20008
Contact	Diane Pellicori
Telephone	(202) 462-4300

Funded By	National Park Service and D.C. Cooperative Extension Service
Cost	n/a
Congressional District	I
Compilation Date	February 1980



In these demonstrations, renewable energies were employed and conservation was highlighted.

Land Use and Conservation: One aspect of the two-part approach to this subject is the site planning involved in the fair itself. This maximized the passive solar energy applications, the ease with which waste-collection and recycling took place, and travel and communication opportunities. The second part--issues such as land conversion, the relationship between land-use planning and energy conservation, pollution control, and growth management--consisted of exhibits, workshops and speakers.

Transportation: Covered here were cleaner, less oil- and gas-dependent transportation modes, carpooling, tours of the D.C. Metro system, solar electric cars, gasohol cars, suburban, rural and special-group transportation, and various aspects of bicycle use.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DC
Project Name	National Childrens' Island

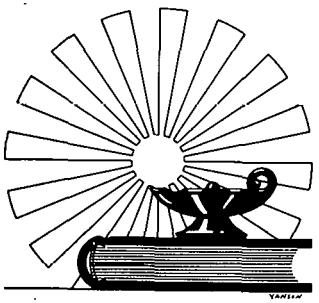
The National Childrens' Island, a public, non-profit corporation, is planning to add three solar greenhouses, a windmill, and a solar administration building to their project, the National Childrens' Island.

The greenhouses will provide facilities for horticultural and environmental education. The windmill will supply some of the electricity for the island. The administration building will be outfitted with a system comprised of a solar furnace with a rock storage bed, reflective film on dual-glazed windows, and a wood stove. An electric resistance heater will be used for back-up heat, and a small portable heater will take care of the building's minimal hot water needs.

Prior to its opening, the park, which is one-third finished, will hold pilot programs and demonstrations oriented toward energy conservation. The 46-acre park is situated on two islands in D.C.'s Anacostia River. Prior to being taken over by National Childrens' Island, the islands were used as a city dump and landfill site.

Organization	National Children Island Corporation
Address	614 H Street, N.W. Room LL-1 Washington, D.C. 20001
Contact	Joe Henson
Telephone	(202) 727-3045

Funded By	Federal and District Governments, UPO, P.L. Graham Fund, H. M. Strong Foundation
Cost	$1.4 million to date $4 million more needed
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	DC
Project Name	P O W E R

The District of Columbia is planning a comprehensive energy-education program that will consist of four main projects.

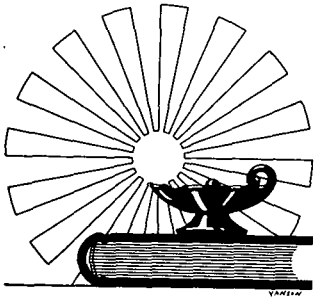
First will be an energy-conservation awareness program--Preserve Our Washington Energy Resources, (POWER). This program which will begin in 13 District schools is aimed at students ranging in grades from K - 12. Student clubs will be organized in the schools, that will aim to include energy patrols for school buildings and perform energy audits. An appropriate curriculum to compliment these programs is in the development stages.

An Energy Information Center will be set up in an unused school building that will have a library with audio-visual and hand-out materials, a display of hardware, an energy hotline, and space for presentations and workshops. This center will be open to the public.

The third aspect of this program will be In-House energy-conservation measures. Committees consisting of students, teachers, parents and administrators, in conjunction with the Buildings and Grounds Department, will identify and implement conservation strategies.

A fourth component is to establish an evaluation committee that would solicit and evaluate any energy-conservation proposals for ref[illegible]tting any of the District's 200 school bu[illegible]gs.

Organization	D.C. Public School System
Address	415 12th Street, N.W. Suite 805 Washington, D.C. 20004
Contact	Peter Boe
Telephone	(202) 724-4098 or (202) 724-4099
Funded By	DOE, District government
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DC
Project Name	St. John's Child Development Center

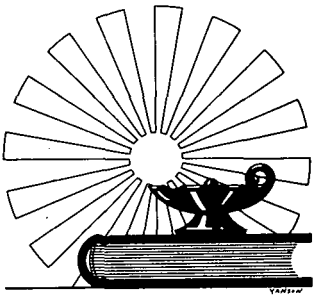
St. John's Development Center, an elementary/high school for mentally retarded and autistic children, is building, with technical assistance from the University of the District of Columbia's Cooperative Extension Service's Energy Unit, a passive solar greenhouse. The greenhouse, which will be part of a horticultural therapy program, will be attached to a woodworking shop.

The roof and south wall of the structure will be double-glazed, while the sides and back wall will be constructed of concrete blocks. These, together with a rock bed floor and twenty-seven 55-gallon drums will provide thermal mass for the structure. Fiberglass will provide insulation and thermastatically controlled vents will control the temperature of the structure. The system is designed to provide 100 percent of the structure's heating needs during the day, and 50 percent at night.

The St. John's students have been instrumental in building and decorating the greenhouse.

Organization	St. John's Child Development Center
Address	5005 MacArthur Blvd., N.W. Washington, D.C. 20016
Contact	Dr. McCabe
Telephone	(202) 363-7032
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Critique/analysis: Lack of funds will deter the appropriation of plants and woodworking materials.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	DC
Project Name	United Planning Organization

The United Planning Organization, also known as the Community Action Agency of the District of Columbia, has several on-going energy projects.

The first project, the Energy Awareness Office, works closely with the District's Energy Office to put on seminars and workshops for interested groups and for 32 neighborhood-development centers. These seminars cover aspects of energy issues that are of specific interest to each participating group. The office also offers testimony for various related hearings within the D.C. government.

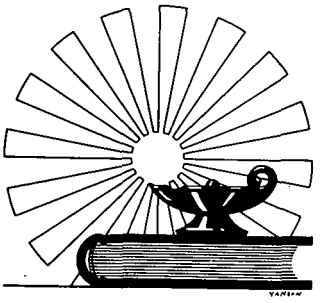
Another UPO project is a complete weatherization program for qualified low- and fixed-income families in the District. Referred homeowners are visited by a UPO staff member who determines their qualifying status and considers their home's basic design. If the homeowner qualifies, an appointment is made for a site analysis to determine what energy-efficient improvements will be made. The improvements and a follow-up inspection are carried out by UPO's staff. On the 362 homes retrofitted by UPO in 1977-78, the average fuel savings have been 23 percent. The average cost for retrofit materials never exceeds $400. UPO is interested in expanding their program to include landlords and tenants, since tenants comprise the largest segment of District residents, especially those residents of low-income status.

In conjunction with the weatherization program UPO trains their CETA staff in energy auditing and in the basic skills of carpentry, plumbing, and electronics. Basic training takes place in two weekend-workshops. Upon completion of the workshops, participants are placed with professionals for on-the-job experience. Seminars, conducted by visiting energy specialists and by professional personnel, are also offered. To date, approximately 75 people have been trained, 11 of whom have joined the UPO staff.

UPO also operates a Utility Payment Plan.

Organization	United Planning Organization (UPO)
Address	1810 Edwin St., N.E. Washington, D.C. 20018
Contact	Axel Dennis or Sharon Cook
Telephone	(202) 638-7300

Funded By	Community Services Administration, DOE and DOL
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

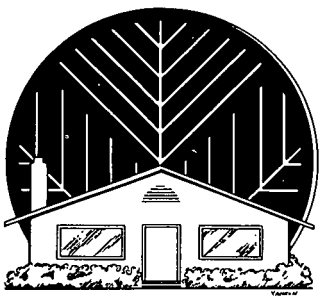
Category	Housing
State	DC
Project Name	Fort Lincoln Senior Village #1

Fort Lincoln Senior Village is a newly constructed, 187-unit center for the elderly. With HUD funds the center has installed a domestic hot water system.

The system is comprised of 96 collector panels that circulate a glycol-water fluid through a heat exchanger and to a storage tank. It has an oil-fired back-up heater.

Critique/analysis: I.B.M., which is monitoring the system for efficiency, has in the 2 years of its operation, found no serious problems.

Organization	Fort Lincoln Senior Village #1
Address	3001 Bladensburg Road, N.E. Washington, D.C. 20018
Contact	Earl Sturgess
Telephone	(202) 529-7730
Funded By	HUD
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	DC
Project Name	Solar Powered Cabooses --Lights and Signals

Southern Railway has equipped 80 of its cabooses with solar power to provide rear-end train lighting. The decision to use solar came as a result of the Federal Railroad Administration's new regulation requiring all freight trains to have rear-end lighting.

Solar power was found to be the cheapest form of energy available for this purpose: the cost to outfit each caboose was $1,700.

In addition to rear-end lighting, Southern has pioneered the use of solar energy to power grade-crossing signal systems located in remote areas. The first of these systems was installed in Rex, Georgia, in 1974. Since then systems near New Orleans, La., Jackson, Ala., Hattiesburg, Miss., and Chatanooga, Tenn., have also been similarly outfitted.

The Louisiana system saved Southern $50,000 by obliviating the need to extend expensive primary AC lines. The signal systems are powered by solar cell array panels. Stand-by batteries, charged by the panels, are used for back-up energy.

In the future, Southern plans to use solar for enclosure heating purposes, and to modify remote micro-wave heating stations that are now powered by propane-gas burning generators.

Organization	Southern Railway Company
Address	Box 1808 Washington, D.C. 20013
Contact	Mr. Geeslin
Telephone	(202) 383-4000

Funded By	Southern Railway
Cost	$1,700 (each caboose)
Congressional District	I
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

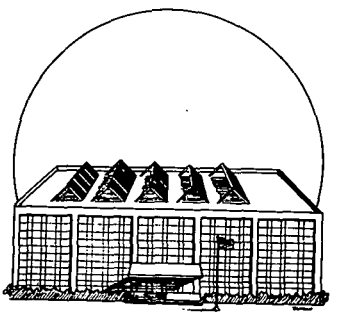
Category	Institutional
State	DC
Project Name	Scottish Rite Temple

This building uses a liquid solar collector system comprised of 21 panels, 56 heat pumps, and a 10,000-gallon storage tank. The system provides the building with 100 percent of its hot water, and also covers its heating and cooling needs.

The system, in operation since February 1978, uses an antifreeze liquid for protection against extreme weather.

Critique/analysis: There have been no major problems with the system, which reportedly makes a substantial contribution toward the energy demands of the building.

Organization	Scottish Rite Temple
Address	2800 16th St., N.W. Washington, D.C. 20036
Contact	Mr. Cox, Bldg. Supt.
Telephone	(202) 232-3579
Funded By	Private
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	DC
Project Name	D.C. Dept. of Housing & Community Development

The Department of Housing and Community Development is renovating two row houses at 3317 and 3319 Holmead Pl., NW. The two three-bedroom units in each building will be made available to low-income families. Funded with HUD cycle 4 monies, solar space- and water-heated systems are being designed and installed in the houses.

The systems (one per building) are comprised of 16 flat-plate collectors, an 800-gallon storage tank with a single-wall heat exchanger, a 50/50 propylene glycol/water antifreeze fluid a water-to-air heat pump, and an electric resistance heating system in the air ducts for back up heating.

At present the homes are being insulated and weatherized. Installation of the solar systems was expected to be completed by late October. The heating bills will be monitored to determine the percentage of load that the systems will provide. It is expected that they will contribute an average of 60 percent of the heating demands.

Organization	D.C. Dept. of Housing & Community Development
Address	1341 G St., N.W. Washington, D.C. 20005
Contact	Sal Cicero
Telephone	(202) 724-8855
Funded By	HUD
Cost	$17,500 per building
Congressional District	I
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	DC
Project Name	Natl. Black Veterans Organization

The National Black Veterans Organization is conducting two different energy-conservation programs in the District of Columbia. With federal funds channeled through the District Government, it weatherized 211 public housing units last year. The group is looking to expand their service to other low-income residents such as the handicapped and senior citizens on fixed incomes. The staff is made up of CETA workers who have been trained in weatherization by the United Planning Organization.

For the last three years, the NBVO has also conducted a recycling program. It has been picking up paper from local government offices and conducting neighborhood drives for newsprint and aluminum. From September 1977 to August 1979, NBVO collected 6.9 tons of paper and aluminum, which would have cost the city $61 a ton to dispose of.

NBVO is now organizing a demonstration project for recycling desk-top office paper from five District Government buildings.

NBVO has another recycling program in operation in Los Angeles. In Atlantic City, New Jersey, a similar program is in the development stages.

Organization	Natl. Black Veterans Organization
Address	629 F St., N.W. Washington, D.C. 20004
Contact	Yvonne Austin
Telephone	(202) 638-2399
Funded By	CETA
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	DC
Project Name	Community Energy Self-Reliance

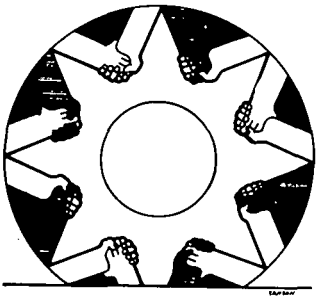
The Citizens' Energy Project is preparing a book, Community Energy Self-Reliance, that introduces a grassroots approach to energy planning.

The book stresses the practicality and economic feasibility of renewable resources and appropriate technology as alternatives to centralized power (i.e., nuclear power). The book also emphasizes that self-reliance and community action are necessary to make these options a reality.

The book will be published in five volumes. Sections will discuss alternative technologies, conservation strategies, and alternative agriculture, among others.

The first volume of the book, entitled "Direct Solar," will be available in the spring of 1980. Copies may be ordered from the Citizens' Energy Project.

Organization	Citizens' Energy Project
Address	1110 6th St., N.W. Washington, D.C. 20001
Contact	Ken Bossang
Telephone	(202) 387-8998
Funded By	Levinson Foundation
Cost	$10,000 (project)
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	DC
Project Name	D.C. Solar Coalition

Organization	D.C. Solar Coalition
Address	P.O. Box 3233 Washington, D.C. 20009
Contact	Debi Higgins Sally Carey
Telephone	(202) 882-3811 (202) 232-1561

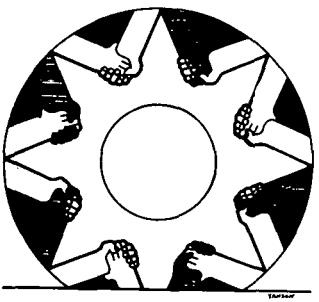
Funded By	United Planning Organization (partial)
Cost	$800.00
Congressional District	I
Compilation Date	February 1980

The D.C. Solar Coalition is a non-profit community organization whose goals are to inform and to educate people about the uses and benefits of solar energy. On November 10 and 11 of 1979, in conjunction with a city-wide meeting on model solar programs, the Coalition sponsored a demonstration "hands on" workshop at D.C.'s Sorrento building (a multi-unit apartment building for low-income elderly people).

The focus of the workshop was on rental residents, since this group comprises approximately 70 percent of D.C.'s population. The workshop taught residents how to weatherize their own apartments and informed them of the benefits and uses of solar energy. This education/information occurred by means of films, lectures, and "hands on" activities related to thermal shutters, weatherization, and a passive solar wall heater. The high point and culmination of the workshop was the actual installation of a solar wall heater built by the participants.

The location of both the workshop and the heater is significant since both have served as positive statements of the viability of solar heating in apartment buildings. In addition, the workshop was a positive step for Sorrento residents, since the building is soon to become a cooperative organization.

Critique/analysis: The Solar Coalition is pleased with the workshop's success and plans to use the results of this project in future activities. The Coalition plans to hold a Neighborhood Energy Planning Workshop, and to compile a catalogue of alternative energy resources in D. C.



The Solar Coalition worked closely in planning and implementing the November workshop
Jubilee Housing, Inc., an organization
cated to providing quality housing for
poor and low-income residents.

Renewable Resources—A National Catalog of Model Projects

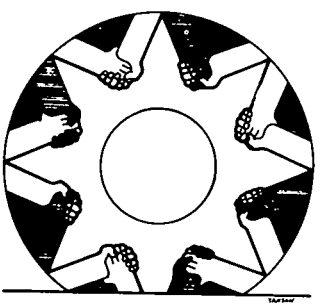
Category	Outreach
State	DC
Project Name	The Elements
Organization	The Elements
Address	1747 Conn. Ave., N.W. Washington, D.C. 20009
Contact	James Ridgewary
Telephone	(202) 234-6484
Funded By	Natl. Ctr. for Appropriate Technology
Cost	$1,500
Congressional District	I
Compilation Date	February 1980

The Elements, a newspaper concerned with social and environmental issues, has compiled a compendium of legislation on alternative energy and agriculture introduced to Congress in its 1978 winter session.

A section on DOE is included in the publication with information on its organization, function, and key officials.

The publication was disseminated to area community-action agencies and community-development corporations, as well as to public interest groups and organizations.

The National Center for Appropriate Technology provided information on this project.



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	DC
Project Name	Energy Efficiency Alliance

Organization	Energy Efficiency Alliance
Address	1302 18th St., N.W. #603 Washington, D.C. 20036
Contact	Burt Jackson
Telephone	(202) 833-2222

Funded By	Donated Time & Contributions
Cost	n/a
Congressional District	I
Compilation Date	February 1980

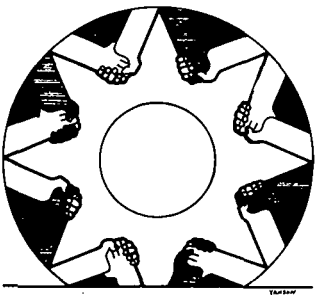
The Energy Efficiency Alliance, a non-profit organization, was conceived by a task force of the National Association of Market Developers (Washington Chapter) to demonstrate the feasibility of combining solar heating technology, job training, and small business development. It is comprised of citizens from government, academia, and the private sector of the District.

Plans to retrofit 84 to 90 units (which are held by the District Government's Department of Housing and Community Development) with various low-cost solar/gas space- and water-heating systems are in the development stages. These buildings, which are primarily rowhouses, will be available to low- and moderate-income families.

A component of the project will be a training program in energy conservation. Insulation and solar systems construction, and installation skills will also be included in the program.

The Energy Efficiency Alliance hopes to involve the local utilities, government, educational and private sectors in financing and executing this project. They anticipate a grant from DOE.

Beyond this project, the Alliance is interested in educating the community in renewable resources and in providing technical assistance for future projects.



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	DC
Project Name	Institute for Local Self-Reliance

Organization	Institute for Local Self-Reliance
Address	1717 18th St., N.W. Washington, D.C. 20009
Contact	David Macgregor
Telephone	(202) 232-4108

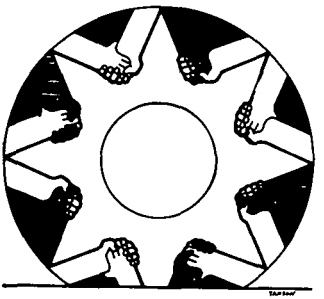
Funded By	Grants, Publications, Contributions and Consulting
Cost	$268,754 (1978)
Congressional District	I
Compilation Date	February 1980

The Institute for Local Self-Reliance (ILSR) is a private non-profit research and technical assistance organization established in 1974. In name and practice the Institute promotes self-reliance. It helps cities and neighborhoods put their wealth to work and keep the benefits in the community. It does this by analyzing local economies, evaluating technologies that may be applicable to the community, and economic development through democratic decision-making. Working through contracts with community groups and government agencies at the local, state, and federal levels, ILSR develops and implements ideas and translates them into specific assistance to groups that approach them.

On a local level the Institute is involved in projects in the areas of energy, waste utilization and urban agriculture. The Institute, through the Anacostia Energy Alliance and under contract with Neighborhood Housing Services and the District's United Planning Organization, is holding six workshops on conservation and solar. In addition, the Institute is conducting an energy audit program. This is the first phase of a three- to five-year developmental project in neighborhood energy planning.

In another neighborhood, the Institute is working with the NUV 1* organization to construct a small-scale alcohol fuel plant. It is negotiating with local supermarkets and produce centers for plant wastes, and it plans to train neighborhood youths in its operation.

* NUV 1 is a community organization located in downtown Washington. Its name is derived from the four streets (North Capital, U, V and First) that bound its office building and the organization's three-quarter plot of land.



The Institute has been working with the District Government in writing the Residential Conservation Service Energy Plan and has been in contact with them concerning various aspects energy policy planning.

In waste utilization, the Institute has provided assistance to the Dupont Circle Neighborhood Ecology Corporation to develop and implement its recycling program.

Community Park West in the Adams Morgan neighborhood is the site of a community garden that the Institute has supported and helped start. ILSR is now designing a brochure and school program for the park under a grant from the Environmental Protection Agency.

Most important, the Institute itself is a working example of renewable technology integration. It recycles wastes by separation and also has a composting toilet, a single-panel solar hot water system, and a passive solar roof-top greenhouse.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	DC
Project Name	Neighborhood Housing Services, Inc. (NHS)

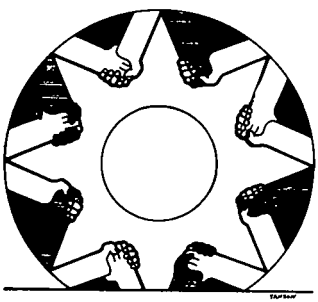
Neighborhood Housing Services, Inc., is a private, non-profit organization that offers financial and technical assistance to neighborhood revitalization programs.

Under a grant from the National Center for Appropriate Technology, NHS conducted six solar retrofit workshops for residents of D.C.'s Anacostia neighborhood. An introduction to energy conservation and renewable energy technologies was also offered at the workshops.

An extension of NHS is the Anacostia Energy Alliance, an organization funded to further energy-conservation efforts in the Anacostia area.

The National Center for Appropriate Technology provided information on this project.

Organization	Neighborhood Housing Services, Inc.
Address	1308 V St., S.E. Washington, D.C. 20020
Contact	James W. Lowell
Telephone	(202) 889-0091
Funded By	Natl. Ctr. for Appropriate Technology; DC Dept. of Housing, using CD Funds.
Cost	$32,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

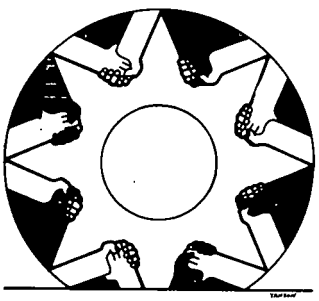
Category	Outreach
State	DC
Project Name	Utility Information Publications

The Environmental Action Foundation is an organization that acts as a clearing house on environmental issues: utilities, nuclear economics, solid and hazardous wastes, toxic substances, clean energy and conservation.

To assist community groups working to reform utility policies, the EAF has published three fact sheets: "Utility Financing," "Utility and Industry Involvement in Clean Energy Development," and "Small Hydro and Cogeneration: Making it Happen." Inclused in each publication is background information on problem areas, resources and potential solutions.

Organization	Environmental Action Foundation (EAF)
Address	724 Dupont Circle Bldg. Washington, D.C. 20036
Contact	Utility Clearinghouse Coordinator
Telephone	(202) 659-1130

Funded By	Natl. Ctr. for Appropriate Technology
Cost	$4,428
Congressional District	I
Compilation Date	February 1980



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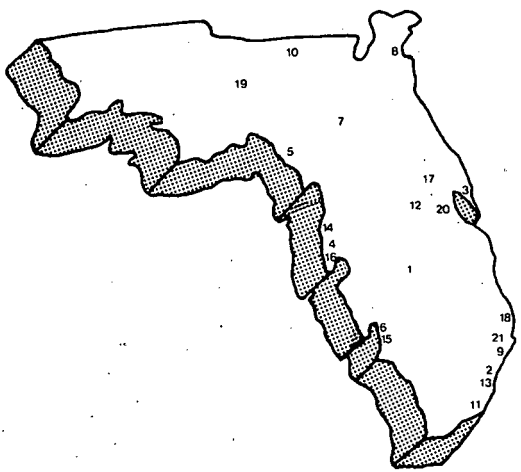
1. Bartow
2. Boca Raton
3. Cape Canaveral
4. Clearwater
5. Cross City
6. Fort Myers
7. Gainesville
8. Jacksonville
9. Lake Worth
10. Madison
11. Miami
12. Orlando
13. Pompano Beach
14. Port Richey
15. Sanibel
16. St. Petersburg
17. Sanford
18. Stuart
19. Tallahassee
20. Titusville
21. West Palm Beach



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Category	Agricultural
State	FL
Project Name	Algal Biomass Processor

The University of Florida is using solar energy to produce animal feed and clean wastewater in the same process. Each day the Agricultural Engineering Department produces 100 pounds of algal biomass. This biomass, which contains more than 40 percent protein and can be fed to swine as a food supplement, is worth $200 per ton.

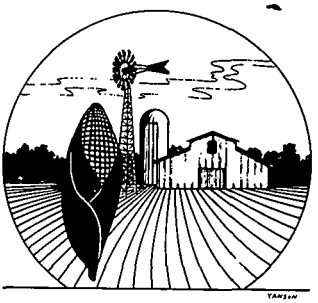
The system used for producing the biomass is incorporated into a lagoon system of a modern 300-Swine operation. Wastewater is discharged from the barns into the first lagoon at the rate of 4,000 gallons per day. An equal amount is fed daily into an algae growth unit that consists of four parallel channels connected at alternate ends to form a continous course 500 feet in length.

New medium enters the upstream end of the shallow channel system and flows slowly to the far end in a minimum of four days. During this time it acquires a dense growth of algae which is then harvested at the end of the last channel by a process of chemical flocculation and auto-flotation.

The algal slurry, composed of about 5 percent solids, is deposited on a combination gravity filter/solar dryer. During the process of algae growth and harvesting, the wastewater is completely refreshed and can be reused.

Organization	University of Florida
Address	Agricultural Engineering Department 9 Rogers Hall Gainesville, FL 32611
Contact	Dr. Edward P. Lincoln
Telephone	(904) 392-1864
Funded By	National Science Foundation, State of FL
Cost	$4,000-installation $2,000-materials
Congressional District	II
Compilation Date	February 1980

Critique/analysis: Although the system is not yet ready for commercial use, it does produce plant protein yields of up to ten times that of conventional crops. Thus, it functions as a highly productive solar energy converter and without further energy costs also provides low-cost wastewater treatment.



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	FL
Project Name	City of Madison Action Plan

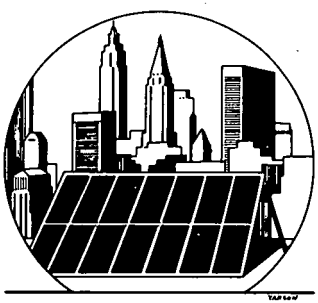
Madison was the home of the first pilot study of a program now being conducted by the North Central Florida Regional Planning Council. To help the city reduce its energy costs and prepare for energy emergencies, the project staff performed an energy audit of all the energy systems and developed an Energy Action Plan based on this analysis.

The plan focused on the city's major energy-using facilities: street lights, sewage treatment, water distribution and treatment, and refuse collection. (Buildings were found to be a minor energy consumer compared to these major systems.) Recommendations were made for all facilities; low or no-cost measures and more expensive options were recommended.

The assembled data was useful not only to the energy analyst but to the city manager, who was able to pick out causal relationships from the data. A major outcome of the plan was the creating of an administrative structure for energy management. The plan also gave the City Commission something concrete to evaluate progress with. The City, in conjunction with Regional Energy Action Committee III, is now funding a detailed study of the street light system.

Organization	City of Madison
Address	109 South Rutledge St. Madison, FL 32340
Contact	Thomas Moffses
Telephone	(904) 973-4181
Funded By	Governor's Energy Office
Cost	5 man-days
Congressional District	II
Compilation Date	February 1980

Critique/analysis: Individuals conducting the study stress the importance of comprehensive inventory and data assembly. They also believe data should be plotted graphically.



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	FL
Project Name	Free Transit Trolley

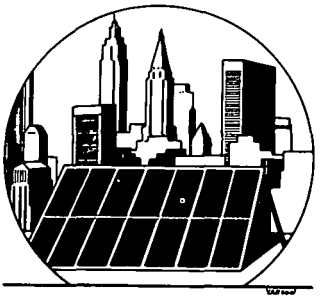
A regularly scheduled "people mover" system began operating in Lake Worth on August 1, 1979. Designed to augment rather than compete with the existing county mass transit operation, the system provides free transportation for city residents from neighborhoods to urban commercial and recreational areas.

To determine the feasibility of the project, the city leased a replica of a San Francisco trolley car for six months. The project proved so successful that the city purchased the trolley, and the Downtown Development Authority, which has the ability to issue bonds, will soon purchase an additional three trolleys.

Projections indicate that revenues from interior and exterior advertising will, within one year, offset the initial costs of purchasing the trolleys, and that revenues generated in the succeeding four years will cover operating and maintenance costs.

Critique/analysis: The project presents an example of cooperation between a local government, the business community, and the public. City Manager Larry Robbins reports that although most residents own automobiles, they prefer not to use them when they can use the trolley. Traffic congestion downtown has eased somewhat since the project began.

Organization	City of Lake Worth
Address	7 North Dixie Highway, Lake Worth, FL 33460
Contact	Larry Robbins, City Manager
Telephone	(305) 585-2571
Funded By	Local government and advertising revenues
Cost	$38,000 per vehicle
Congressional District	XI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	FL
Project Name	John R. Allison Terminal
Organization	Gainesville Airport
Address	P.O. Box 490 Gainesville, FL 32602
Contact	Mr. M.E. Libbon
Telephone	(904) 374-2140
Funded By	EDA, Coastal Plains Regional Commission, City of Gainesville
Cost	$2.3 million
Congressional District	III
Compilation Date	February 1980

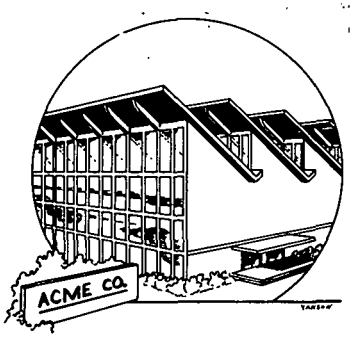
Sixteen thousand square feet of collectors are used to heat and cool 30,000 square feet of floor space and to partially heat 9,500 square feet at the John R. Allison terminal of the Gainesville Regional Airport.

The terminal, inaugurated on January 14, 1979, realized energy savings of approximately $17,000 during the first year of operation. It is expected to have a payback period of about 13 years.

The building incorporates passive solar techniques, as well as active techniques. Operable windows, vents, and high clerestories are placed throughout the building to take advantage of natural cooling and lighting when possible. A sloped roof supports the water-filled collectors. The walls have a .10 U-insulating rating and the roof a .07 U-insulating rating, which enhances the efficiency of the solar system.

Critique/analysis: The system had a few minor malfunctions at first, but with the recently added computerized monitoring system, the solar applications are now functioning properly.

(Information regarding the Gainesville Airport was made available to the Center through the Exxon Publication, "Solar Spectrum", June 1979.)



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	FL
Project Name	Appalacchee Recycle Center

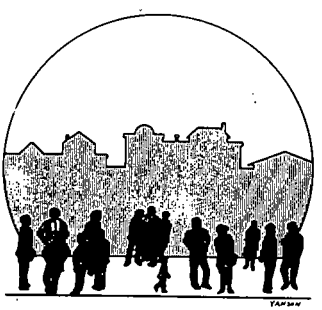
The Appalacchee Recycle Center is a non-profit organization founded in 1975 by University of Florida students.

The Center now collects newspaper, high-grade paper, and aluminum. Collection boxes are located at shopping centers, schools, and apartment complexes all over the city. It is estimated that the Center recycles 80 tons of newsprint, 18 tons of high-grade paper, and one ton of aluminum per month.

Where appropriate, revenues collected from the operation are channeled back to the donor.

Organization	Appalacchee Recycle Center
Address	Rt. 2 3805 A Tallahassee, FL 32301
Contact	Bernie Windham
Telephone	(904) 222-1208
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

(Information on this project was taken by the Center for Renewable Resources from the Georgia Institute of Technology cation, Southern Profile: Appropriate ology in the Southeast.)



Renewable Resources—A National Catalog of Model Projects

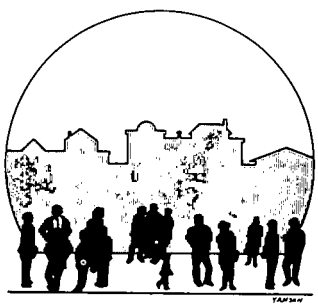
Category	Community
State	FL
Project Name	Save Energy/Save Money
Organization	Regional Energy Action Committee X (REAC X) Treasure Coast Regional Planning Council
Address	P.O. Box 2395 Stuart, FL 33494
Contact	Kevin Henderson, Shirley Hayes
Telephone	(305) 286-3313
Funded By	DOE through State Energy Office, EAC mini-grant
Cost	$2,185 minigrant; $4,225 matching; $6,410 total
Congressional District	X
Compilation Date	February 1980

To make small businesses more aware of the advantages of conserving energy and to help them find specific ways to save energy and money, the Regional Energy Action Committee X (REAC X) launched a campaign called SAVE ENERGY/SAVE MONEY in September of 1978.

Before the campaign began, the committee prepared a brochure that explained the SAVE ENERGY/SAVE MONEY project. It informed potential participants that the campaign would give them tips on energy conservation for small businesses in South Florida; help businesses reduce overhead costs and increase customer good will; supply worksheets on how to conduct an energy audit and how to calculate possible savings by implementing energy-conservation techniques; reward businesses for participating in the program; and encourage customers to patronize businesses that implement energy-conservation measures.

REAC X (Palm Beach, Martin, Indian River, and St. Lucie Counties) received full cooperation from all the Chambers of Commerce in the region and the Chambers sent out the brochure, which was accompanied by a cover letter from the local Chamber. Businesses that returned the reply card then received information sheets, worksheets, and a pledge form from REAC X.

Information sheets with suggestions on how to save energy and money on lighting and air conditioning were included in the package. Worksheets contain "before and after" charts on which KWH per month are calculated for lighting and air conditioning. Businesses that reduce energy consumption may then return a pledge form to REAC X explaining how and where they have cut energy use; in turn, they receive a SAVE ENERGY/SAVE MONEY Energy Conservation Award door decal and certificate.



Critique/analysis: Although brochures were mailed to over six thousand businesses in the four-county area, the REAC X chairman reports only moderate project success. The work required to complete the energy-evaluation forms in the work kit, although minimal, was more than most businesses wanted to do. The chairman suggests testing the SAVE ENERGY/ SAVE MONEY materials on a few businesses and then modifying the program to suit the area.

Renewable Resources—A National Catalog of Model Projects

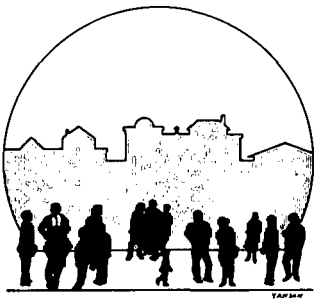
Category	Community
State	FL
Project Name	Energy Expo '79

The second annual Energy Expo '79 was held in downtown Gainesville to expose consumers to a wide range of energy-related technology and information. Some 44 displays and 12 speakers, as well as various concession stands, were featured in the event.

Highlighting the event were the opening ceremonies, the demonstration of the solar ice-cube maker, and the electric bus that carried people to view Gainesville's solar air conditioned airport.

Critique/analysis: Sparse attendance was blamed on rainy weather and inadequate publicity. REAC intends to continue the Expo tradition, gradually enhancing its reputation and increasing the number of co-sponsors.

Organization	Regional Energy Action Committee III
Address	2002 N.W. 13th St. Suite 202 Gainesville, FL 32601
Contact	Chuck Kiester
Telephone	(904) 376-3344
Funded By	Governor's Energy Office, North Central Florida Regional Planning Council, Alachua-Gainesville Regional Utilities
Cost	$3,500.00
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Alternate Energy Course-Edison

The course at Edison Community College on alternate energy was designed for persons interested in learning more about our energy systems and in becoming more energy independent. The presentation is straightforward and involves "hands on" experience.

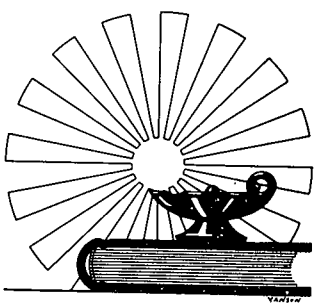
Instructor Lee Werst reports that about half the students take the class for three hours of credit, and half audit the course. Students range in age from twenty to sixty-eight years of age.

In addition to classroom work, students are involved in a number of alternate energy projects. For instance, students have installed a Jacobs wind generator on the roof of the college building. Students are continuously collecting and analyzing data to measure the efficiency of generating electricity using this system, as well as analyzing data on student-built solar collectors.

Critique/analysis: The diversity of the students' backgrounds and the enthusiasm of the instructor and the students have made this class much more successful than was anticipated.

Organization	Edison Community College
Address	College Parkway Ft. Myers, FL 33907
Contact	Lee E. Werst
Telephone	(813) 481-2121 Ext. 258

Funded By	Staff and Program Development Grant
Cost	$7,220 for wind generator
Congressional District	X
Compilation Date	February 1980



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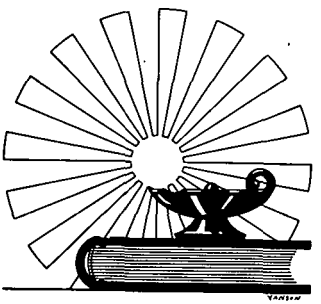
Category	Education
State	FL
Project Name	Alternative Energy Technologies
Organization	University of Florida
Address	Gainesville, FL 32611
Contact	George Ship
Telephone	(904) 392-4674
Funded By	Training U.S. AID
Cost	$2,000,000
Congressional District	II
Compilation Date	February 1980

The training in Alternative Energy Technologies program is designed to involve persons from developing countries in the study of alternative energy. Thirty people from developing nations will be brought to the U.S. and will take part in the learning sessions.

The program, which has received funding for two years, will consist of two 15-week training sessions per year. The program will provide classroom lectures, lab and shop experience, as well as field trips to various solar projects. The first session will convene in April of 1980.

A follow-up consulting program will provide additional assistance to those who participate in the training sessions. This will involve visits to the developing countries by members of the University staff. The object of the travel is to share new developments in alternative energies with these countries to encourage the utilization of renewable resources.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Community Energy, Inc.

Community Energy is an educational organization formed to help local citizens become more aware of energy use and issues. In 1974, the group established a direct market for the county's producers of food, plants, and crafts.

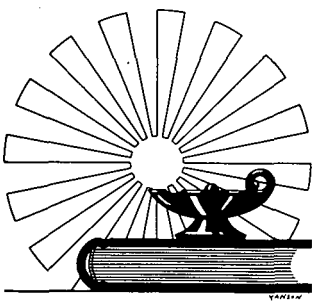
Community Energy has developed and offered eight-week, evening, adult-education classes on effective energy conservation and the practical details of soft technology utilization. The group developed a mobil energy exhibit that now travels to exhibitions and area schools. The exhibit itself is a redesigned school bus that has displays and free literature tables, as well as a screen at the rear of the bus for film-and slide-viewing.

The organization interacts regularly with a local citizens advisory board and with the regional utility board.

Community Energy, Inc. has also been the major sponsor and designer of an annual Solar exposition held in the region.

Organization	Community Energy, Inc.
Address	3701 NW 17th St., Gainesville, FL 32605
Contact	James Notestein
Telephone	(904) 372-2107
Funded By	Regulatory Energy Action Community; City & State Funds
Cost	n/a
Congressional District	III
Compilation Date	February 1980

(Information on Community Energy, Inc. comes from the Georgia Institute of Technology publication, Southern Profiles: Appropriate Technology in the Southeast.)



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Correctional Institution Solar Vocational Training
Organization	Cross City Correctional Institution (CCCI)
Address	P.O. Box 1500 Cross City, FL 32628
Contact	Roscoe P. Bowers
Telephone	(904) 498-5576
Funded By	Federal Disadvantaged Vocational Fund; DOE ($500)
Cost	$150,000
Congressional District	II
Compilation Date	February 1980

"No more the drudgery of stamping out license plates."

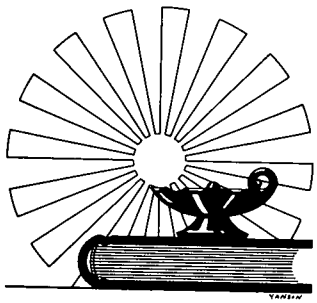
Since June of 1978, inmates at the Cross City Correctional Institution (CCCI) have been enrolled in a vocational training class in solar water heating. With the assistance of a $500 grant from the Department of Energy for textbooks, technical pamphlets, and study guides, the prisoners are preparing for a place in tomorrow's economy.

Roscoe Bowers, vocational coordinator and instructor at CCCI, says he teaches inmates (who represent minimum-, medium-, and close-custody levels) "how to design, assemble, and install solar units, and just as importantly, how to deal with the customer on their level."

After completing the solar course, inmates receive a vocational certificate from the fully accredited North American Heating and Air Conditioning Wholesalers Association Home Study Institute.

Graduates of the "Fundamentals of Solar Heating" learn to sell, design, perform cost and size calculations, and supervise the installation of residential and light commercial solar energy systems involving the use of standard components. The course covers the basics of solar heating and cooling, solar radiation, solar collectors, heat storage, components, sizing, domestic water heating, installation, and service.

Besides strengthening the correctional institution's rehabilitation programs, the project may provide the inmates with the wherewithal to install a solar system on existing correctional facilities.



Several students have obtained solar-related employment upon release from CCCI. With this success in mind, Bowers reports that he would like to develop an advanced course.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Electric Automobile

Don Plank, an artist-illustrator for the U.S. Postal Service, commutes about 30 miles round-trip to work each day in his electric car. He has modified a 1975 Citicar, which now operates on a General Electric six-horsepower motor powered by eight six-volt heavy duty batteries with a 12-volt auxiliary battery.

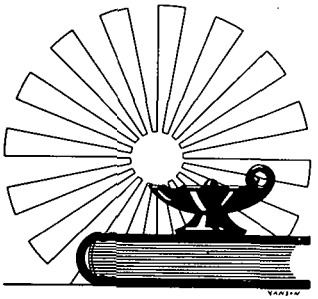
Plank's future plans include installation of photovoltaic cells on top of the vehicle as an added power source.

Plank says his car cruises at 33 miles per hour for the first 35 miles, and will continue for another eight to ten miles with pauses. He keeps daily records of the car's performance and each evening recharges the batteries by plugging them into a 110-volt outlet. According to Plank it costs 1.2¢ per mile to operate his car. The car is titled, licensed, and carries a current inspection sticker.

Florida Power Corporation has furnished instruments to collect data on the car's operation. Reports are sent to interested concerns, including manufacturers of electric automobiles. A second car will be ready for testing soon.

Organization	Don Plank
Address	4321 First Ave. N St. Petersburg, FL 33713
Contact	Don Plank
Telephone	n/a
Funded By	Private, Florida Power Corporation ($500)
Cost	$5,750 to date
Congressional District	VI
Compilation Date	February 1980

Critique/analysis: Occasional problems develop when the car runs out of power and needs to be recharged. Plank carries long extension cords and depends on the interest and good will of others at these times.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Energy Conservation in Water Heating T.V. Spot

With contracted help, volunteer services, and donations, REAC IV produced a 30-second TV spot to elevate the public's awareness of energy-conservation possibilities and the ease with which some savings can be achieved in water heating. The spot is a humorous attempt to motivate individuals to turn down water heater thermostats.

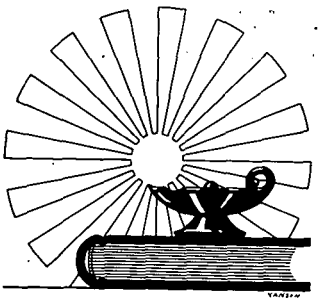
Local actors volunteered their time in production. Printing services associated with the packet (to provide local sponsors with background information) were donated.

A radio spot was made of the same ad. Sponsors have been secured so that both radio and TV ads are being used by area stations.

Critique/analysis: The need for volunteer hours presented some problems.

Organization	Regional Energy Action Committee IV
Address	8641 Baypine Road Jacksonville, FL 32216
Contact	Bobbie Zeman or Bruce Doueck
Telephone	(904) 737-7311

Funded By	DOE through State Energy Office
Cost	$3,900
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Energy Management Center
Organization	Energy Management Center
Address	P.O. Box 190 Port Richey, FL 33568
Contact	Thomas M. Baird
Telephone	(813) 848-4870
Funded By	Pasco County School Dept. & ESEA Title IV/C
Cost	$140,000/yr.
Congressional District	V
Compilation Date	February 1980

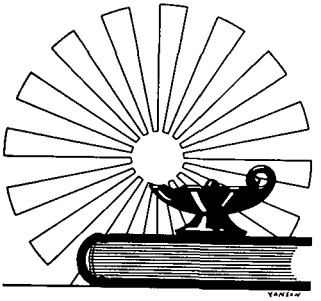
The Energy Management Center (EMC), sponsored by the Pasco County School Department, improves students understanding of energy and energy conservation. Students learn scientific principles relating to energy, the importance of conserving our energy supplies, the history of the uses to which humankind has put energy in the past, and our prospects and methods for obtaining energy in the future.

Classes involved in the project generally spend at least six weeks studying energy. They take two trips to the Center, where they may perform experiments with working models using different types of renewable energy technologies. Among them are wind machines that generate a small part of the energy used at the site, solar collectors for hot water, a solar fresnel lens, solar cookers, photovoltaic cells, a solar water distiller, and a small methane digester.

This pilot program has become an integral part of the science curriculum in the Pasco County School District and since 1978 has been adopted by 21 other school districts.

Teacher training and technical assistance are available in addition to project-developed materials. Training is conducted either at the Center or at the user site.

The EMC offers plans and blueprints of miniature alternate energy devices for use in an instructional setting. These duplicate activities and materials at the EMC. The EMC staff offers technical assistance in setting up other energy-related environmental centers, as well as conducting public workshops and teacher in-service.



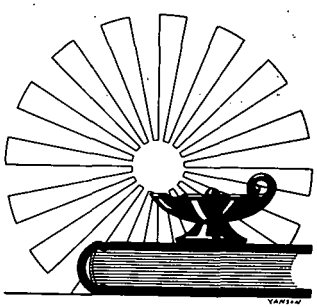
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Environmental Demonstration Center

The Environmental Demonstration Center on the campus of Miami-Dade Community College represents an attempt to construct a technolocally integrated environmentally sound, living environment. When completed the 3600 ft^2 building will utilize passive design features, solar collectors for hot water and space heating, wind power for pumping water and generating electricity, photovoltaic cells for electricity, solar stills for producing alcohol and distilled drinking water, a composting toilet, solar food dryers, and solar cooking devices.

The Center's plans, construction, and financing come from the people it is designed to serve. It has become a favorite field trip place for groups and schools, and many workshops and meetings take place there. In addition, active groups of students are working on and studying organic gardening, nutrition, and nutritional cooking.

Organization	Miami-Dade Community College Environmental Demonstration Center
Address	11011 S.W. 104th St. Miami, FL 33176
Contact	Dr. McGregor Smith, Jr., Project Director
Telephone	(305) 596-1387; 667-2645
Funded By	Private
Cost	$40,000
Congressional District	XII, XIV, XV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Four-Day Work Week

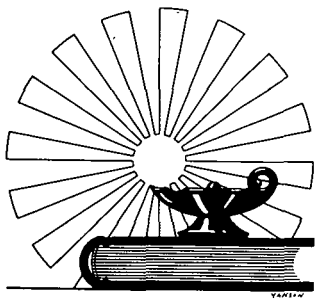
Miami-Dade Community College has initiated a four-day work week during the spring and summer semesters to save energy and money. Not having to air condition over the three-day weekend reportedly saved about $4,000 per month on the South Campus alone. (The school has three additional campuses.)

Students benefit by saving one trip per week to the campus. The school has a standby plan for a four-day week during the fall and winter terms in case the gasoline supply becomes critical again.

The school is also helping faculty carpool. It makes available computer print-outs that list would-be carpoolers by Zip Code.

Critique/analysis: To compensate for the fifth day, the administration lengthened the classes. As a result, both teachers and students report some fatigue.

Organization	Miami-Dade Community College
Address	11011 S.W. 104th St. Miami, FL 33156
Contact	Dr. Peter Masiko, President
Telephone	(305) 596-1211
Funded By	Miami-Dade Community College
Cost	Unknown
Congressional District	XV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Mobile Energy Exhibit

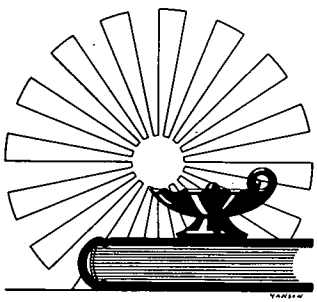
A school bus was fitted out as a traveling exhibition to distribute energy information to people of Alachua County. The seats were removed and counters for pamphlets and other displays were installed in their place.

The bus was outfitted with miscellaneous items, including a slide projector, a variable load hand-crank generator, and a wood stove.

The bus was parked at a shopping mall and interested persons met Jim Notestein, who provided literature and advice on energy problems.

Critique/analysis: Success since the program started in November of 1979 has been moderate. The project is costly because the staff is paid. A project manned by volunteers is feasible, however.

Organization	Regional Energy Action Committee III
Address	2002 NW 13th Street, #202 Gainesville, FL 32601
Contact	Jim Notestein
Telephone	(904) 376-3344
Funded By	Governor's Energy Office, Alachua County Adult and Community Education
Cost	$3,500
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

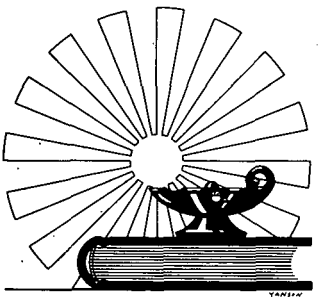
Category	Education
State	FL
Project Name	Mobile Home Energy Consumption Study

This University of Florida program is designed to measure the energy consumption of mobile homes in Zone I. Research is being conducted on available mobile units and on the energy requirements of future models.

The data obtained through this study will be used to determine the best design for extremely energy-efficient mobile homes.

Organization	University of Florida
Address	Mechanical Engineering 325 MED Gainesville, FL 32611
Contact	George Ship
Telephone	(904) 392-4674

Funded By	HUD
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Passive Cooling Through Landscaping

Organization	Florida International University
Address	Physical Science Dept. Tamiami Trail Miami, FL 33199
Contact	Dr. John Parker
Telephone	(305) 522-2605; 522-2536

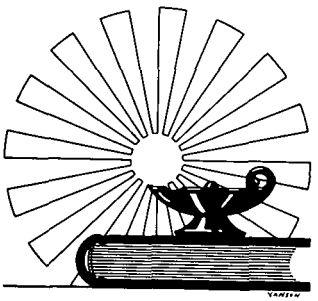
Funded By	FL Atlantic University FL Center for Urban and Environmental Problems
Cost	$2,500 for landscaping; $1,000 for equipment
Congressional District	XV
Compilation Date	February 1980

An energy-conservation research program at the Florida International University (FIU) campus has been able to reduce by 30 percent energy consumption related to the air conditioning of a mobile home by employing "precision landscaping" techniques.

Precision landscaping integrates factors associated with the vegetation, the residence, the path of the sun during the peak of the cooling season, and the peak electrical load during the hottest months. This includes shading windows during peak load hours, as well as channeling prevailing breezes in homes that depend on natural ventilation or in which air conditioning is used only minimally. Other considerations are the use of trees and shrubs that require a minimum of fertilizing, watering, and pesticide use.

To determine the amount of energy that could be saved through effective landscaping, a energy audit was made of a mobile home unit on the Florida International University campus. The unit, totally unlandscaped, had been used as a child-care center. Following the collection of data on solar radiation and peak-load design, the placement of trees and shrubs to provide shade when and where it would produce the maximum energy savings was accomplished.

Critique/analysis: Although large plants were not available for the FIU landscaping program, air conditioning energy consumption was reduced by 30 percent after only one year where there was some vegetative cover. Plans are available, including a paper describing preliminary results.



Renewable Resources—A National Catalog of Model Projects

Category Education

State FL

Project Name Project Sunshine

"Project Sunshine" was launched on October 15, 1979, to inform the public about the advantages of solar water heating, increase consumer confidence, and boost solar hot water installations. The six-week pilot program, a cooperative effort between the Florida Solar Energy Center (FSEC), the Southern Solar Energy Center (SSEC), the Florida chapter of the Solar Energy Industries Association (FSEIA), the Governor's Energy Office and the Institute of Food and Agricultural Sciences, was designed to promote solar water heating in Dade, Broward, and Palm Beach Counties.

The outreach campaign involved the use of televison public service announcements, mail stuffers in monthly bills from Florida Power and Light, Sun Banks, billboards, and coordinated advertising by the solar industry.

FSEC and FSEIA held a free installation workshop for solar dealers in each county. In addition, six seminars for consumers were held, and weekly columns appeared in 60 newspapers for the length of the project. Consumers were informed that they could call toll free to FSEC to request a free booklet on solar water heating.

The project will be replicated in Central Florida in the Spring of 1980.

Critique/analysis: A final report and evaluation will be completed in March of 1980.

Organization Florida Solar Energy Center

Address 300 State Road 401
Cape Canaveral, FL
32920

Contact Dr. Gerard Ventre

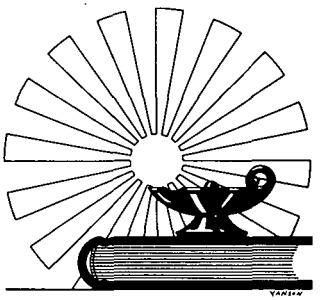
Telephone (305) 783-0300

Funded By Southern Solar Energy Center

Cost $40,000

Congressional District IX

Compilation Date February 1980



Renewable Resources—A National Catalog of Model Projects

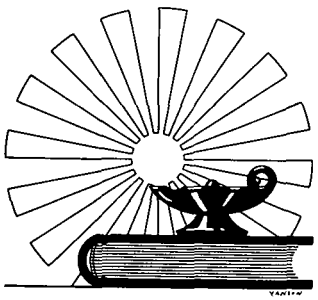
Category	Education
State	FL
Project Name	Santa Fe Solar Energy Workshop

"A Solar Energy Workshop" is held each term at the Santa Fe Community College, Gainesville. The purpose of the workshop is to inform consumers of the current availability and use of solar products. Energy conservation, active and passive design, and retrofit construction are discussed along with historical, economic, and future developments for alternative energies.

Each workshop meets weekly for eight weeks, and features field trips to local installations. The students construct a 4' x 8' solar collector as part of the workshop. These collectors will soon be installed on the campus to provide hot water for one of the community colleg's buildings.

Emmich reports that enrollment in the workshops has exceeded all initial expectations. (The average class size is 24.) Participants range from high school students to senior citizens, and include architecture students, home builders, and homeowners.

Organization	Santa Fe Community College
Address	P. O. Box 803 Gainesville, FL 32601
Contact	Ehrit Ellen Emmich
Telephone	(904) 377-5161 Ext. 290
Funded By	Community Instructional Services
Cost	$30.00/per student
Congressional District	II
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

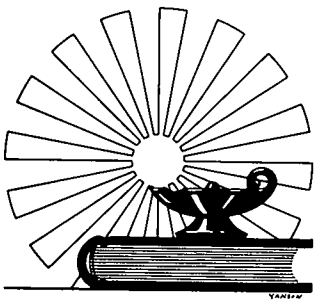
Category	Education
State	FL
Project Name	Slide Show — "Energy and Northeast Florida"
Organization	Regional Energy Action Committee IV
Address	8641 Baypine Road Jacksonville, FL 32216
Contact	Bobbie Zeman or Bruce Doueck
Telephone	(904) 737-7311
Funded By	DOE through State Energy Office Mini-Grant
Cost	$1,100
Congressional District	III
Compilation Date	February 1980

As a basis for a meaningful dialogue on energy in Northeast Florida, REAC IV staff decided an overview of the region — its energy sources, production, and uses — was necessary. Members produced a slide show explaining the energy situation in the five-county area — how energy is produced, how it is used, especially in industry and agriculture, and how energy affects land use. Ten slide shows with accompanying audio cassettes and workbooks for teachers were produced.

Slide shows were given to each county school district, the Regional Planning Council, the State Energy Office and REAC. In addition, 1,000 brochures that described the slide show and the REAC energy speakers bureau were produced.

The show was very well received. Duval County reproduced 40 copies and has provided one to each secondary school in the county.

Critique/analysis: Problems centered on the need for many hours of the time of skilled volunteers to take photographs, secure a pilot for aerial shots, and perform other work.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Solar Energy Classes Young Museum

Organization	John Young Science Museum and Planetarium
Address	810 East Rollins Orlando, FL 32803
Contact	Wyatt H. Gantt
Telephone	(305) 896-7151

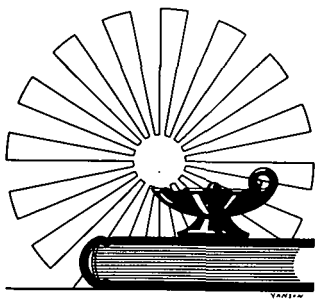
Funded By	John Young Museum and Planetarium
Cost	$305
Congressional District	IX
Compilation Date	February 1980

To introduce young people (age 10 and up) to solar energy and appropriate technology, the John Young Science Museum and Planetarium offered two short courses during the summer of 1979.

"Solar Power" was designed to teach the fundamentals of solar energy through a combination of lectures, movies ("Solar Energy — the Great Adventure"), and workshops. In workshops, the students constructed a parabolic-trough solar hot dog cooker (at a cost of 50¢). They also constructed a miniature thermosyphon solar water heater (at a cost of $3.95), which they used for making hot chocolate.

A course, "Energy Engineering," covered the fundamentals of appropriate technology as an immediate answer to our energy shortages. Students attended lectures, viewed movies and slides, saw demonstrations of many alternate technologies, and participated in workshops. Technologies reviewed included agriculture (organic) aquaculture, compost toilets, digestors, wind generators, and direct solar energy. A mini-digestor was operated in the class, and each day, methane was burned as a demonstration.

In addition, students took a field trip to a location where a home-size (55-gallon drum) biomass digestor was operated to produce gas to operate a small engine. Each student was provided with a solar kit consisting of a photovoltaic cell, a small motor, and a propeller (cost, [illegible]0 each kit). One class period was spent studying the operating principles of the photovoltaic cell and conducting simple experiments with the devices.



Critique/analysis: The instructor for both courses was Wyatt H. Gantt, an engineer who serves as a

community resource volunteer and who gives frequent lectures in the Orange County Public School System on solar energy. He reported that both classes were successful and that students exhibited keen interest in the material presented.

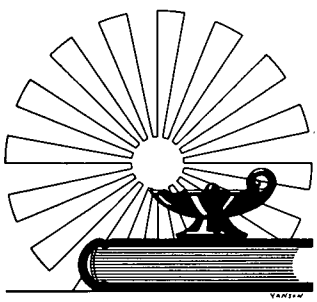
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	FL
Project Name	Solar Engineering Associate Degree Program
Organization	Brevard Community College
Address	835 Sycamore Street Titusville, FL 32780
Contact	Dr. Norm E. Abell
Telephone	(305) 269-5664
Funded By	NSF and Florida Vocational Education Department
Cost	$50,000 for equipment
Congressional District	IX
Compilation Date	February 1980

In August of 1979, Brevard Community College (BCC) initiated the state's first two-year Associate Degree program in Solar Engineering Technology at its new Titusville campus. The program was developed by the National Science Foundation. BCC was chosen as one of five colleges in the nation to offer the solar program.

The Solar Engineering Technology curriculum is a planned sequence of college-level courses designed to train students in the installation, design, sizing, research, and testing of solar systems and components. The curriculum is geared toward both high school graduates and those with competency in mechanics, heating, ventilating technology, or air-conditioning work.

The curriculum consists of an integrated sequence of core solar energy courses and support courses. A curriculum including solar energy lectures, discussions, laboratories, activities, exercises, and projects ensures that the students who satisfactorily complete the program achieve training in a marketable skill and technical expertise in solar energy.



Renewable Resources—A National Catalog of Model Projects

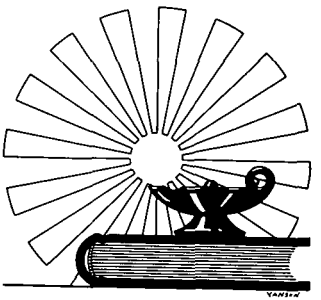
Category	Education
State	FL
Project Name	Solar for Tampa Community Correctional Facility
Organization	Department of Corrections
Address	1311 Winewood Blvd. Tallahassee, FL 32301
Contact	William H. Kelley
Telephone	(904) 488-1063
Funded By	Legislative General Revenue Appropriation
Cost	$36,210 (no labor cost is included)
Congressional District	VII
Compilation Date	February 1980

In June of 1977, the Tampa Community Correctional Facility inaugurated what is reportedly the first solar hot water and space heating system to be installed in a U.S. correctional facility.

The collectors were built in a factory at the Union Correctional Institution at Raiford, where inmates normally produce metal furniture. The system was installed by staff and inmate personnel.

In addition to the collectors for the Tampa project, the Raiford facility has manufactured solar panels for other state-sponsored solar projects. Among them are public housing and a dormitory, both located in Gainesville, and two Florida Department of Agriculture milk-inspection stations near Jacksonville. Also, several forestry service wardens' homes have been retrofitted with solar hot water systems using panels created at Raiford.

Critique/alalysis: Unfortunately, no information is available on how useful this training proved to be for individuals upon release; however, the skills learned qualify inmates for job opportunities other than solar hot water installations.



Renewable Resources—A National Catalog of Model Projects

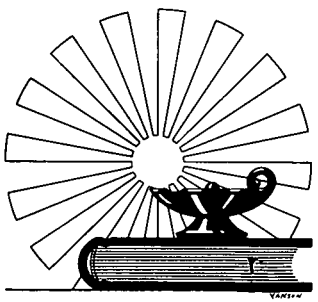
Category	Education
State	FL
Project Name	U.S. International Training Center

The U.S. International Training Center is a project of the Solar Energy and Energy Conservation Lab and of Dr. Erik Farber. The lab serves as a training center for non-U.S. citizens interested in appropriate technology.

Each year the Center accepts 100 students who enroll in 1-or 2-, 15-week sessions. In the morning, theory and properties of appropriate technology systems are taught. These theories are applied in the afternoon when students actually build the systems. Projects, whether based on solar, wind, or geothermal power are chosen to suit the natural environment of the students' countries. The center provides building materials that duplicate those materials found in the students' native countries, so the training is of practical value to the students when they return home.

The Center remains in contact with students after they return home. It offers help and encouragement from afar.

Organization	Energy & Solar Energy Conservation Lab
Address	University of Florida Gainsville, FL
Contact	Dr. Erix Farber
Telephone	(904) 392-0812
Funded By	State
Cost	$1-3 million
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

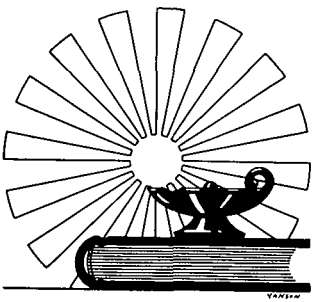
Category	Education
State	FL
Project Name	University of Florida Solar Center
Organization	Solar Energy and Energy Conversion Laboratory
Address	University of Florida Gainesville, FL 32611
Contact	Dr. E.A. Farber
Telephone	(904) 392-0812
Funded By	State
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The faculty and 20 graduate students at the University of Florida at Gainesville is involved in all facets of solar research. One of the largest solar research facilities in the world, the Solar Energy and Energy Conversion Laboratory has been in operation at the University of Florida for more than 25 years. Long instrumental in bringing about many notable developments in solar technology, the facilities of the Solar Energy and Energy Conversion Laboratory have recently been consolidated. They are now part of the Energy Research and Education Park, a facility established in 1978 for the study of renewable energy resources and energy conservation.

The University of Florida Solar Energy Conversion Laboratory, along with the United States Agency for International Development, has also created an educational program offering representatives from developing countries training and consultation in the application of alternative energy technologies. This program exists primarily to provide these representatives with the chance to acquire the technical skills needed to apply the appropriate technologies under the conditions prevailing in their home countries.

These objectives will be met through a 15-week curriculum comprising lectures, seminars, informal discussions, laboratory and shop sessions, and field trips to selected facilities near Gainesville. This program also provides "hands on" training with equipment and in the shops of the Solar Energy and Energy Conversion Laboratory.

The University of Florida is also conducting a Technical Information Development Program to provide the Governor's Energy Office with experimental data on residential energy conservation, enabling it to prepare energy audits, conservation bulletins, and many useful publications on energy consumption within the state, to which the study is specifically tailored.



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	FL
Project Name	Anheuser-Busch Solar Pasteurization

The Anheuser-Busch brewery has retrofitted its Jacksonville facilities to include a solar collection, storage, and retrieval system. The 4,603 ft^2 of tube collectors make this one of the largest systems of its kind in Florida.

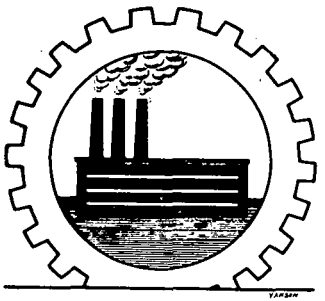
The system, introduced to the public on Sun Day (May 2, 1978), heats process water for use in pasteurizing bottled beer. The pasteurization process uses solar-derived energy in one of the three heating zones in the brewery. In the "Solar Zone," the bottles of beer are sprayed with 146 degree process water for five minutes and 47 seconds. The temperature of the beer is raised to 143 degrees, thus completing this phase of the pasteurization process.

The storage and transfer system utilizes a phase-change material in conjunction with a heat-transfer fluid. The phase-change material alternates from a solid to a liquid, as the temperature varies, allowing more energy to be stored in the same volume as other storage systems. Heat from the transfer fluid is transferred to the water for use in the pasteurization process.

The system is monitored and controlled by a computer. Since its completion in February of 1978, the system has worked well.

(Information regarding the Anheuser-Busch Brewery was obtained from Southern Profiles: Appropriate Technology in the Southeast, by Jeff Tiller and Dennis Creech, and through a "Thermelt" handout.)

Organization	Anheuser-Busch Brewery
Address	111 Busch Dr., Jacksonville, FL 32218
Contact	John Miller
Telephone	(904) 751-0700
Funded By	Anheuser-Busch Private
Cost	$500,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	FL
Project Name	Kaplan Industries
Organization	Kaplan Industries, Inc.
Address	P.O. Box 427 Bartow, FL 33830
Contact	L.W. Umstadter, Project Manager
Telephone	(813) 533-4161
Funded By	DOE, Hamilton Standard, and Kaplan Ind.
Cost	$1,475,000
Congressional District	VIII
Compilation Date	February 1980

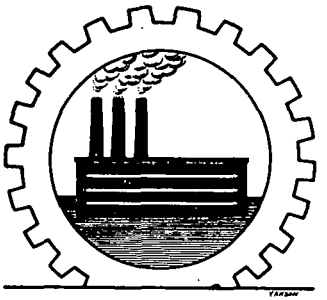
In early 1979, Kaplan Industries, Inc., one of Florida's largest slaughterers and packing facilities, began producing methane gas from cattle manure. Since then it has reduced its petroleum use by over 50 percent; and once the plant is operating at full capacity, the system will provide all of Kaplan's energy needs.

Excess methane will be used to produce electricity through a plant that Florida Power Corporation will build in 1980. Electricity produced will be sold to Florida Power's customers.

Besides helping Kaplan significantly reduce its petroleum use, the methane digestion process yields a by-product of high-protein sludge cakes that can be used as a cattle refeed product and also as a food for fish. Each day, Kaplan recycles about 500,000 gallons of water, which it cleans up in a series of anaerobic and aerobic ponds. Tilipia fish are raised in the ponds to eat the algae, and the fish are harvested by commercial fishermen.

The land on which Kaplan Industries is located has been mined for phosphate and is almost without organic content. Kaplan has been revitalizing this land by spreading some of the other waste products from the slaughter operation on it. Now it can produce hay and grass for the cattle without the application of commercial fertilizer.

Critique/analysis: Kaplan Industries is very pleased with the project. Project Director Larry Umstadter points out that because the plant is experimental, it has a great deal of costly built-in equipment for monitoring



performance. Even so, the payback period for this plant will be between five and eight years. The only significant problem to date has been the lack of enough cattle to run the operation at full capacity.

Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	FL
Project Name	Palm Beach County Schools Conserve
Organization	Palm Beach County Board of Public Instruction
Address	3323 Belvedere Road West Palm Beach, FL 33402
Contact	Bob Alles, Utility Management Office
Telephone	(305) 683-0050, Ext. 261
Funded By	General Operating Revenues
Cost	n/a
Congressional District	XI
Compilation Date	February 1980

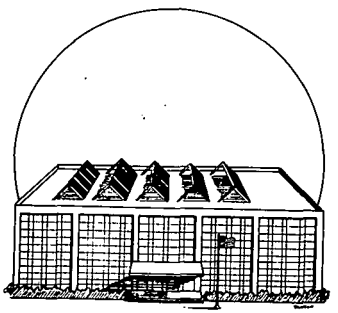
Concern about escalating utility costs led the Palm Beach County school system to initiate a voluntary energy- and utility-conservation program. In late summer of 1976, a Utility Management Committee was formed to draft a comprehensive Utility Management Program. The Committee urged that each school appoint one person to take responsibility for the conservation effort.

In mid-November, a utility conservation checklist and suggestion packet written by the Committee were given to each principal in the county. A 22-question checklist of conservation points was accompanied by several pages of suggestions on potential savings.

Schools were encouraged to involve students, faculty, staff, and custodians in the project, to request suggestions from these groups, to develop an educational training program, and to emphasize utility conservation in the instruction program and extracurricular activities. The schools were urged to experiment when possible.

The school board established and staffed a small Utility Management Office to coordinate and boost the conservation efforts. For its part, the central staff of the school board provides a centralized energy-conservation information center, regular data on energy consumption for each school or center, and a direct financial incentive to each school or center to conserve energy.

The county provides incentive to each school or center by rebating 25 percent of the money saved through energy-conservation programs. The recipients are authorized to use those funds to purchase supplies and equipment that



are not covered in their annual budget. Additionally, another 25 percent of the money saved through conservation in the entire school ;ict is set aside for the purchase of gy-conservation devices. The remainder of tne district savings are returned to the general fund.

During the first 19 months of the program, the school board realized average monthly savings of $40,845; tentative estimated savings for FY '79 indicate average monthly savings of $10,329.

Critique/analysis: The declining amount of average monthly savings indicates that immediate low cost energy-conservation measures are reaching the limits of their effectiveness. Additional savings will occur only after individual site audits and the installation of more costly energy-management techniques and conservation devices.

The State Department of Education, in cooperation with the State Energy Office, published the Palm Beach Utility Management Program as a guide for other school districts. It calls the guide "an outstanding commitment toward planning and implementing an efficient utility and energy management system."

Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	FL
Project Name	Boca Raton Solar Hospital

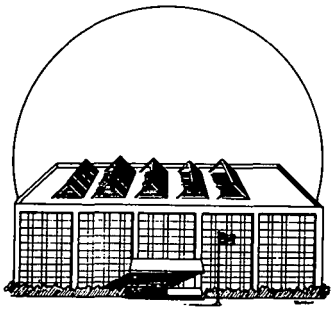
In 1977, a 4,000 ft. solar collector system was retrofitted onto the nine-story Boca Raton Community Hospital, a 350-bed, full-service health facility. The solar collectors are constructed of steel panels rather than more expensive copper. The panels were coated with a non-corrosive material to allow the use of hollowed pressed steel for water flow. The savings in equipment selection helped make this system extremely cost- and energy-effective. A double coating of glass further increases the panels efficiency.

A heat recovery incinerator with a pneumatic trash chute was installed at the same time as the solar system. Regulations prohibit the disposal of medical wastes from the hospital in the Boca Raton trash-disposal area, so the system solves the hospital's waste-disposal problem and at the same time uses the waste to heat domestic hot water. A pneumatic system speeds the trash from the hospital floors to the incinerator to directly supply the necessary "fuel" the boiler.

The combination of these two systems provides 95 percent of all the hospital's hot water needs, thus reducing their bills for natural gas by over $3,000 per month. By burning the trash accumulated within the hospital complex, they save an additional $25,000 to $30,000 annually in trash-handling fees.

The hospital has since installed a computer system to control electrical load use. The object is to cut energy costs while maintaining or improving comfort and safety levels. The computer system also provides printed reports that allow the hospital to determine its daily energy consumption and improve its energy-conservation efforts.

Organization	Boca Raton Community Hospital
Address	800 Meadows Road Boca Raton, FL 33432
Contact	Charles M. Jaycox
Telephone	(305) 359-7100
Funded By	Private
Cost	$230,000
Congressional District	XI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	FL
Project Name	Times Building

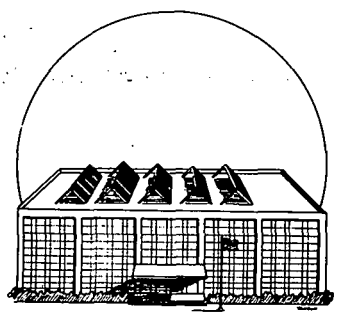
The new Clearwater Times building is a showplace of energy-efficiency. It is windowless, so heat- and cooling-losses are minimized. It is surrounded by an earthern berm, which helps hold in heat in the winter and helps keep the structure cool in the summer. The building has double roofs and an angled roof line on which 240 solar panels are connected.

The water in the closed circulating system is pumped at a constant rate of 108 gpm through the solar panels. This system utilized two 5,000-gallon insulated storage tanks. Two sealed "chilling" units contain a Lithium Bromide solution that surrounds the solar-heated hot water coils.

Also, a 115-foot tower fitted with three egg-beater-type turbines has been erected at a cost of $140,000. This system is expected to produce a maximum of 15 to 20 kilowatts. The electricity generated by the turbine will be used to supply power to the company's computer system through a bank of batteries.

Added energy-saving features include interior lighting and special light switches.

Organization	Clearwater Times Publishing Company
Address	710 Court Street Clearwater, FL 33516
Contact	John Kruck
Telephone	(813) 893-8491
Funded By	Times Publishing Co.
Cost	$1.6 million
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	FL
Project Name	Gainesville Solar Retrofit

In 1977, the Gainesville Housing Authority decided to retrofit one of its low-income apartment complexes to use solar energy. Inmates at Raiford's Union Correctional Institute agreed to construct solar collectors at a cost within the GHA's budget.

In October of 1977, the complex's 28 apartments were retrofitted to include a liquid solar system, providing heat and domestic hot water for the 1,000 ft^2 units.

The system is currently being monitored to determine whether it is providing the complex with 85 to 90 percent of its energy supply as expected. Results of the monitoring should be available by the spring of 1980.

Critique/analysis: Since a construction error made in 1977 has been corrected, the system is reportedly working very well.

Organization	A.J. Suskind
Address	Box 1468 Gainesville, FL 32602
Contact	A.J. Suskind
Telephone	(904) 377-8851

Funded By	Public Housing Modernization Fund
Cost	$155,000
Congressional District	II
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	FL
Project Name	Solar Greenhouse

Organization	Seminole Employment Economic Development Corporation
Address	P.O. Box 2076, 2737 Melonville Ave., Sanford, FL 32771
Contact	James A. Prior
Telephone	(305) 784-4290

Funded By	National Center for Appropriate Technology
Cost	$4,186
Congressional District	V
Compilation Date	February 1980

The Seminole greenhouse project was designed to test the feasibility of using an active greenhouse to heat nearby buildings and to develop a low-cost means of creating low-income businesses to produce potted foliage plants.

All though the greenhouse was never finished, it can, nevertheless,serve as a model for similar endeavors.

The project demonstrated that a rockbed is not practical in Florida because the rocks available are too small (a saturated soilage material in a semi-pulverized state is believed feasible), and that controlling the amount of light entering the building to allow for the growing of foliage plants is essential in Florida. Those involved in the project came to believe that automated light controls, which are expensive, are required, and thus would rapidly increase costs. It was therefore felt the object of keeping the costs minimal made the active greenhouse infeasible.

Critique/analysis: A passive greenhouse with double-glazed panels is feasible, according to Prior. He says that light control could be accomplished by means of shade cloth that would be put up seasonably. A fan would have to be used to direct the air downward for heat transfer, though.

Renewable Resources—A National Catalog of Model Projects

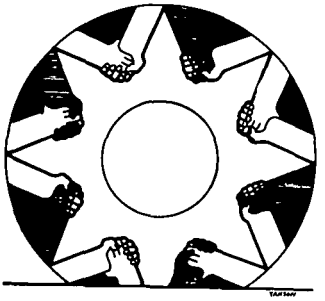
Category	Outreach
State	FL
Project Name	Center for Governmental Responsibility

The Center for Governmental Responsibility was formed in 1972. Its missions are to promote accountability of public officials and institutions and to conduct legal research on issues relating to executive, legislative, and judicial functions at the state and national levels.

The Center's solar-related work includes research on legal and institutional barriers to the increased use of solar energy. The Center drafted the sales-tax exemption passed in 1979, and is engaged in an ongoing effort directed at new legislation in Florida.

Organization	Center for Governmental Responsibility
Address	Holland Law Center University of FL Gainesville, FL 32611
Contact	Duke Woodson
Telephone	(904) 392-2237

Funded By	State and federal agencies, private foundations and companies
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	FL
Project Name	Florida Solar Energy Center

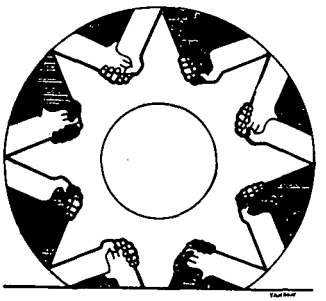
In 1974 the Florida State Legislature created the Florida Solar Energy Center (FSEC). Part of the State University system, it is administered by the Florida Board of Regents. Its objectives are to advance research and development in solar energy, provide educational and informational services, provide technical assistance to state agencies in the development of solar standards, and conduct demonstration and collector-testing programs.

Research, development and demonstration projects include those on solar water heating, solar space heating and cooling, photovoltaics, biomass, wind, and passive solar applications.

Solar equipment testing certification and development of new standards receive heavy emphasis at the Center. Since October of 1976, the Center has been conducting a program to test and certify solar collectors.

The Center staff members also provide the Florida Legislature with information on solar energy. It maintains a technical and general library of more than 7,000 pieces, publishes a quarterly newsletter, and sponsors workshops.

Organization	Florida Solar Energy Center
Address	300 State Road 401 Cape Canaveral, FL 32920
Contact	Dr. David L. Block, Director
Telephone	(305) 783-0300
Funded By	State and Federal
Cost	$2,000,000 (1978)
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	FL
Project Name	Sanibel-Captiva Conservation Center
Organization	Sanibel-Captiva Conservation Foundation, Inc.
Address	P.O. Drawer S Sanibel, FL 33957
Contact	Richard W. Workman
Telephone	(813) 472-2329
Funded By	SCCF
Cost	n/a
Congressional District	X
Compilation Date	February 1980

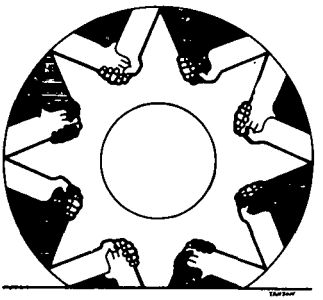
The Sanibel-Captiva Conservation Foundation (SCCF) Center actively sponsors a wide variety of programs, exhibits, and workshops in ecology, renewable energy, and energy conservation. In the past two years, over 30,000 people from all over the United States and the world have visited the foundation's facilities.

Each Tuesday, beginning in November and running through the spring months, the Center offers programs designed to involve people in energy- and environment-related issues. Ten of 20 programs presented in 1978 were energy related. About 60 persons attended each program.

In addition, consumer information workshops are held which address such topics as solar water heating systems, passive solar design, solar heated pools, native landscaping, and energy conservation landscaping. The organization has a sun-sighting device that demonstrates the importance of house orientation and passive solar design.

As part of its energy conservation campaign, SCCF actively support recycling programs. It has a collection project for Australia pine, an exotic tree that has multiplied quickly throughout the state, taking over many native plant communities. The pine, however, has a very high Btu content; SCCF, therefore, has established a system whereby people may leave the unwanted wood for those who need it for fuel.

The Center is also committed to native plant landscaping. Ornamental landscaping is a large consumer of fossil fuels (used in propagation, watering, fertilization, pesticides, cutting and disposal). Native plant communities, however, are considered an effective means of saving energy. Cyprus swamps, for example, are effective in assimulating sewage.



The Center actively supports energy conservation in other ways as well. Its passive solar-design facility does not require heating or cooling devices; the Center's hot water needs are met by a system of highly visible solar collectors. In spring of 1979, SCCF installed a photovoltaic lighting system for the Center's entryway. Electricity produced by the system is stored in batteries until needed. It is believed to be the first solar-cell system to be installed in a non-government facility in Florida.

To encourage the conservation of gasoline, anyone arriving at the Center on foot or bicycle is admitted free.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	FL
Project Name	Energy Conservation Seminars for Business
Organization	Governor's Ene: Office
Address	301 Bryant Building Tallahassee, FL 32301
Contact	Frederick A. Roth
Telephone	(904) 488-2475
Funded By	State of Florida
Cost	Varies
Congressional District	State-wide
Compilation Date	February 1980

A series of "Energy Conservation is Good Business" seminars, co-sponsored by the Governor's Energy Office (GEO), the Florida Retail Federation, and local Chambers of Commerce, was held in ten Florida cities in September of 1979.

The purposes of the seminars were to help businesses reduce energy consumption and to comply with the Federal Emergency Building Temperature Restrictions (FEBTR), and to emphasize specific conservation measures. The seminars help participants identify and examine differences in energy needs as they exist in Florida, and attempt to create an atmosphere in which government, business, and the general public can work cooperatively for the common good.

Participants received materials on the FEBTR and information on how to cut costs on lighting, air conditioning, and transportation. Booklets for retail stores, restaurants, supermarkets, and office buildings contained graphs showing how energy is being used and listed 50 conservation suggestions. In addition, energy audit workbooks were made available to operators of hotels, motels, retail businesses, office buildings, and restaurants.

Critique/analysis: The project director reported that attendance at the seminars was sparse, most likely because small business people aren't willing to take the time to attend, and many large corporations have their own energy-conservation programs.

Those who did attend were frequently key individuals who controlled operations at many locations. The groups showed considerable interest in the subject matter, and discussion and information exchange flourished. Follow-up contacts will be made to determine the program's success.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	FL
Project Name	Photovoltaic Use in South Florida

In the Spring of 1978, the South Florida Water Management District (SFWMD) installed photovoltaic solar arrays at four remote locations where conventional power was not available. Each array, producing ten watts of electricity in full sun, is mounted with a radio antenna on a 40-foot mast.

The SFWMD is the state agency that controls the canals constructed by the Army Corps of Engineers. It also manages water flow and storage in an 18,000 square mile area for flood control.

The district operates 38 unattended remote stations where environmental data is gathered and transmitted by radio to its headquarters in West Palm Beach. Most of these stations are served by utility power. However, where power is not available, the District has turned to solar power.

Critique/analysis: The project has successfully provided electrical power to equipment at locations where utility power is not available. The solar arrays have performed very dependably: none has failed. More solar-energized stations are planned for future installation at other locations.

Organization	South Florida Water Management District
Address	P.O. Box V West Palm Beach, FL 33402
Contact	Martin A. Antman
Telephone	(305) 686-8800
Funded By	District operating funds (state)
Cost	n/a
Congressional District	II
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Utility
State	FL
Project Name	Energy Audit and Information Program

Organization	Jacksonville Electric Authority
Address	233 West Duval St. Jacksonville, FL 32202
Contact	Bruce Doueck
Telephone	(904) 633-6123

Funded By	Jacksonville Electric Authority
Cost	$200,000/year
Congressional District	III
Compilation Date	February 1980

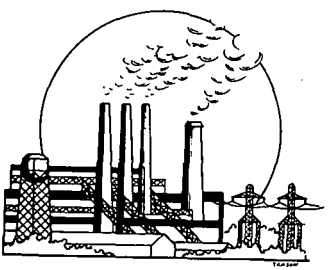
The Energy Audit and Information Program was initiated to help Jacksonville Electric Authority (JEA) customers reduce their use of electricity and lower their utility bills. The program employs eight full-time employees. Their duties include conducting energy audits for JEA residential customers; assisting small commercial customers in reducing electric energy consumption; answering consumers' questions over the phone; and computing heating and cooling loads and helping customers choose efficient equipment.

They also provide literature on energy conservation to the community; speak to schools, clubs, civic and church groups; provide authoritative information on energy conservation to the media; and interface with local energy groups on conservation and alternative energy issues.

The program began in 1975 under the auspices of the Mayor's Office. In September of 1977, JEA took over the program. Customers do not hesitate to take advantage of JEA services, which are offered free of charge.

Early evaluations showed average savings to customers of approximately 250 KWH/month.

Critique/analysis: JEA reports that the only current problem is that the demand for services peaks with the weather. It suggests having ongoing training so the staff can stay up with developments and technologies.



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	FL
Project Name	Refuse Conservation to Methane

Organization	Waste Management, Inc. RefCOM
Address	2900 N.W. 48th St. Pompano Beach, FL 33067
Contact	Charles H. Perron, P.E. Plant Manager
Telephone	(305) 974-7500 Ext. 275

Funded By	DOE
Cost	$3,700,000
Congressional District	XII
Compilation Date	February 1980

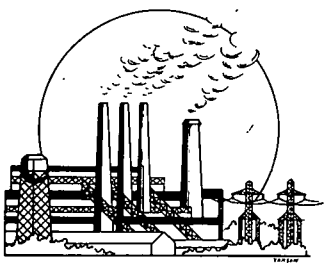
The principle of converting waste materials to energy is being practiced in Pompano Beach at Waste Management, Inc. One of the world's largest waste-management companies, its operations include collection, storage, processing, and disposal of solid and liquid wastes.

The Pompano Beach facility, which began operating in 1971, was the first privately owned and operated facility of its type in the country.

Solid municipal waste (SMW) goes through a shredding process that yields a pulverized material that is fire-resistant, free of unpleasant odor, unappealing to rats, and fit for use as a sanitary land-fill without expensive daily cover.

Fifty to one hundred tons of SMW is processed by the plant each day and ends up as methane and carbon dioxide. The process includes shredding, source separation, and air classification. After going through these processes, the waste material is introduced into a pre-mix tank where it is blended with sewage sludge, water, and nutrients. This slurry is then metered into two anaerobic digestors where approximately half of the organic feed solids are converted biologically into a product consisting of about half methane and half carbon dioxide.

A feasibility study will evaluate the entire process to establish technological and economic information bearing on the commercial utilization of the process.

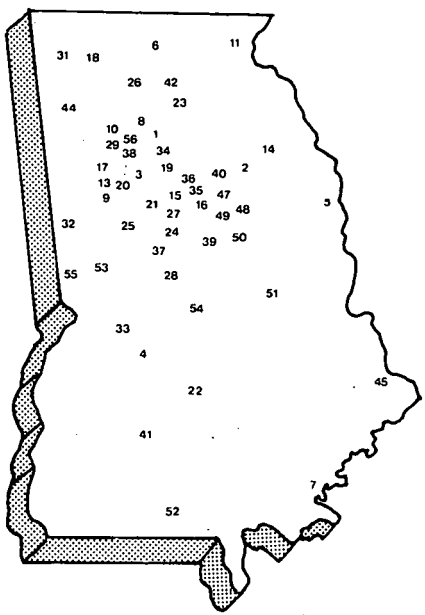


RefCOM expects to produce about 300 ft^3 of methane and the same amount of carbon dioxide from every ton of processed refuse. The plant eventually will be able to produce enough methane to serve an estimated 10,000 families.

Critique/analysis: The plant manager is pleased with the success of the project, claiming it is running on schedule and producing methane. However, machinery breakdowns and equipment jams have caused some problems.

GEORGIA

1. Alpharetta
2. Athens
3. Atlanta
4. Americus
5. Augusta
6. Blairsville
7. Brunswick
8. Canton
9. Carrollton
10. Cartersville
11. Clayton
12. Cliftondale
13. College Park
14. Comer
15. Conyers
16. Covington
17. Dallas
18. Dalton
19. Decatur
20. Douglasville
21. Fayetteville
22. Fitzgerald
23. Gainesville
24. Griffin
25. Hapeville
26. Jasper
27. Jonesboro
28. Kathleen
29. Kennesaw
30. Kings Bay
31. Lafayette
32. LaGrange
33. Leesburg
34. Lilburn
35. Lithonia
36. Loganville
37. Macon
38. Marietta
39. Milledgeville
40. Monroe
41. Moultrie
42. Murryville
43. Ossabaw Island
44. Rome
45. Savannah
46. Shenandoah
47. Snellville
48. Social Circle
49. Stone Mountain
50. Stockbridge
51. Swainsboro
52. Valdosta
53. Warm Springs
54. Warner Robins
55. West Point
56. Woodstock



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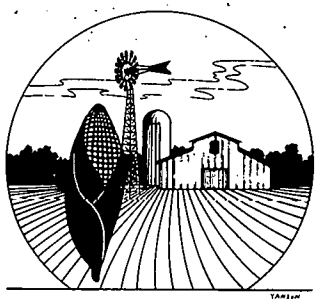
Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	GA
Project Name	Methane from Poultry Manure

T. Joe Chastain runs a poultry farm (22,000 chickens) that has been generating methane for the last 3 years. The system has been rated at 1075 BTU/Ft^3 by the local gas company.

Organization	T. Joe Chastain
Address	Rt. 3, Box 209A Dwdy Mill Road Jasper, GA 30143
Contact	T. Joe Chastain
Telephone	(404) 479-2565

Funded By	n/a
Cost	n/a
Congressional District	IX
Compilation Date	February 1980

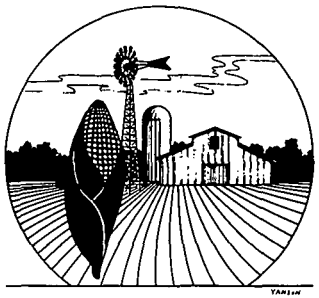


Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	GA
Project Name	Methane Generator

A methane generator using poultry manure has been built near Cumming, Georgia. The methane generator, a silo-like structure located at the site of a large poultry-raising operation (to minimize transportation costs) was constructed as a research project conducted by Georgia Institute of Technology. The methane generator produces 1,150 cubic feet of methane gas per day from the manure of 60,000 hens.

Organization	Georgia Institute of Technology
Address	Atlanta, GA 30332
Contact	Jerry Birchfield
Telephone	(404) 894-3475
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	GA
Project Name	Morgan Farm Greenhouses

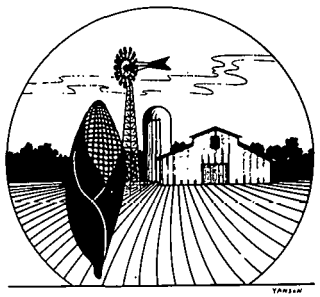
Three interconnected greenhouses and one cold frame have been constructed on the Morgan Farm in Kennesaw. Two of the greenhouses are above-ground with closed walls (and 3" fiberglass insulation) on the north and northwest. The structure's south side is sloped at 45 degrees and is double glazed with corrugated fiberglass on the outside and plastic poly on the inside.

Twenty-five 5-gallon metal cans filled with water, and painted black provide space heat. A small electric fan is used to circulate air inside the greenhouse. A gas heater is used to supplement heat at night during the coldest winter months.

The third greenhouse is below ground designed after the "pit greenhouse" idea. Temperature difference between three greenhouses usually averages 15 degrees, and each is about 20-30 degrees warmer than temperature outside at night.

Organization	Morgan Farm
Address	Rt. 4, Box 122 Stilesboro Rd., Kennesaw, GA 30144
Contact	R. Jep Morgan
Telephone	(404) 422-7375

Funded By	Private
Cost	$1,500
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	GA
Project Name	Wood-Heated Poultry Houses

Georgia Tech is currently conducting a research project on the heating of poultry grow-out houses near Carrollton, Georgia. Two identical 40' x 325' broiler growout houses with a capacity of 15,000 birds were selected. Each is equipped with automatic side curtains and insulated with 3½ inches of fiberglass in the ceiling.

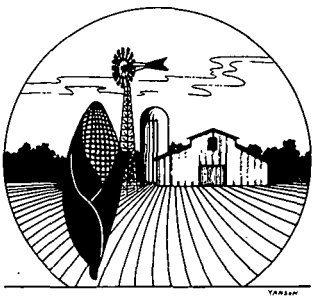
One of the houses uses 20 conventional LP gas brooders having a heating capacity of 30,000 Btu per hour each.

The other house also uses the LP gas brooders as a back-up heat source for the 350,000 Btu/hr wood-fired furnace. The furnace is housed in a small building adjacent to the poultry house. Warm air from the furnace is distributed through the house using conventional ducts. Twenty ducts bring warm air to within 24 inches of the ground, where it is exhausted through diffusers.

During the 10 months of operation, the wood burning system provided virtually all of the space heating needs of the house, saving $1,300-worth of LP gas compared to the standard house. The initial cost of the wood furnace system was $9,350.

Organization	Georgia Institute Technology
Address	Office of Pub. & Inf. Engineering Exp. St. Atlanta, GA 30332
Contact	Peggy Bronn
Telephone	(404) 894-3405

Funded By	n/a
Cost	$9,350 (wood furnace system)
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	GA
Project Name	City-Leased Solar Collectors

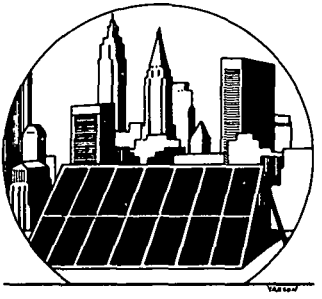
The City of Atlanta is submitting a proposal to the U. S. Department of Energy for funds to study the feasibility of instituting, and developing, if feasible, a program whereby solar water heaters would be sold or leased by city government to Atlanta citizens. Both the installation and materials costs would be amortized over monthly payments.

The project objectives are to stimulate the commercialization of solar energy, to make attitudes toward the use of solar energy more favorable, and to enable citizens to lower their utility bills without the disincentive of high upfront capital outlays.

Included in the program would be development of legislation for the protection of "sun rights".

Organization	City of Atlanta Department of Budget and Planning
Address	700 City Hall Atlanta, GA 30303
Contact	Angie Jones Energy Coordinator
Telephone	(404) 658-7284

Funded By	DOE
Cost	$8,930
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	GA
Project Name	Solar Assisted Neighborhood Facility

The Southeast Neighborhood Facility is the City of Atlanta's first public building that uses solar energy. The facility houses nine public and private social service agencies ranging from day care to recreation and mental health. Two conference rooms and a community kitchen are available for the nine Atlanta neighborhoods served by the facility.

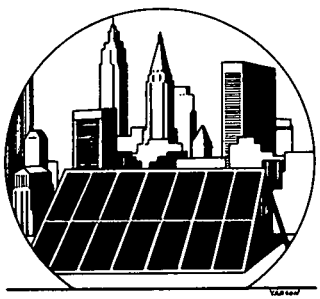
The building is a three story concrete structure of approximately 46,820 square feet. Construction costs were $2,000,000, with funding coming from a Community Development Block Grant.

The building incorporates several passive solar design features, and has a solar-assisted electrical heat pump system. All windows are double glazed and face either north or south and are inset to permit reliable sun control. Earth berming along the south facing front wall further minimizes heat loss and gain.

The heat pump system incorporates solar heated water from 96 rooftop collectors. Surplus heat collected by the solar panels is stored in a 6,000-gallon insulated storage tank.

A sub-committee of the Citizens Neighborhood Advisory Council provided resident input throughout planning and construction of the building, including selection of the site and design of the building.

Organization	S.E. Atlanta Neighborhood Facility
Address	215 Lakewood Way Atlanta, GA 30315
Contact	Brenda Smith
Telephone	(404) 658-7855
Funded By	Community Development Block Grant
Cost	$2 million
Congressional District	VI
Compilation Date	February 1980



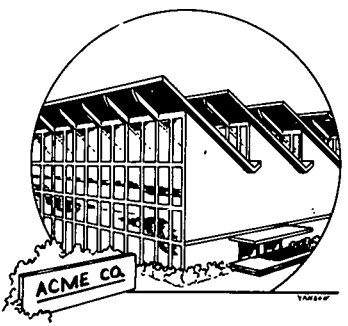
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Burrows' TV & Appliance Solar System

In 1973, John Burrows retrofitted his store with a system using liquid flat plate collectors to provide space heating. Heat is stored in an insulated water storage tank and distributed through the store using a fan coil arrangement in the duct work. A water source heat pump is used for back-up heating.

Critique/analysis: There have been a few mechanical problems.

Organization	Burrows' TV & Appliance
Address	307 N. Main St. Lafayette, GA 30728
Contact	John Burrows
Telephone	(404) 638-2932
Funded By	Private
Cost	$7,500.
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

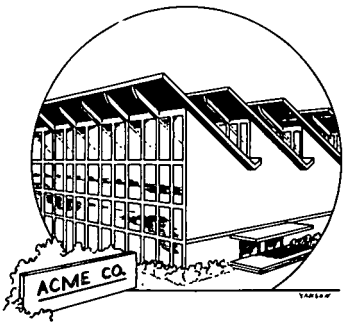
Category	Commercial
State	GA
Project Name	Energy Conservation Group
Organization	Days Inns of A a, Inc.
Address	2751 Buford Highway, NE Atlanta, GA 30324
Contact	James A. Grissett, Jr.
Telephone	(404) 325-4000
Funded By	$167,037 Matching DOE grant
Cost	$30,000 per installation
Congressional District	VI
Compilation Date	February 1980

Days Inns formed the Energy Conservation Group at the beginning of the 1974 Oil Crisis, and has used this group to review, study and implement the various energy conservation programs for the Day Companies. They adopted a three-phase program including the resetting of thermostats, turning off equipment not in immediate use, etc. These items effected a 15 percent - 25 percent reduction in utility costs.

As a result the study, a solar hot water system was installed on the Inn at Anderson, S.C., in November of 1977. The system was a drain-down type, with 750 sq. ft. of collectors and a 1000-gallon water storage tank. The system was designed to heat 40 percent of the 1800 gallons of hot water needed daily by the 116-room complex.

The cost of the system was $20,325, half of which was funded by the Department of Energy, with an anticipated payback of seven years based on the total project cost.

Based on the Anderson experience, the Day Companies currently have six additional systems completed or under construction, and five additional systems are planned. Funded with the help of a $167,037 matching funds grant from the Department of Energy, each solar hot water system will cost an estimated $30,000. Installations are scheduled on a four-stage cycle which began in March of 1979 with a final completion date of March of 1980.



A typical solar system, consisted of a total collector area of at least 1,000 sq. ft., and a water storage tank of at least a 1,000 gallon ity.

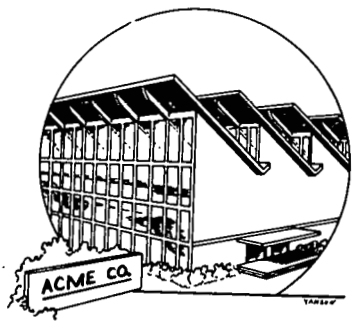
Each solar system is designed to heat approximately 65 percent of the hot water needed for the complex. The anticipated payback is projected not to exceed seven years.

Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Holiday Inn Solar Hot Water Preheater

A liquid flat plate collector system preheates domestic hot water, resulting in a 36 percent reduction in the motel's natural gas consumption.

Organization	Holiday Inn
Address	726 Broad St. Gainesville, GA 30501
Contact	Cecil Jones
Telephone	(404) 536-4451
Funded By	Private
Cost	$10,000
Congressional District	IX
Compilation Date	February 1980

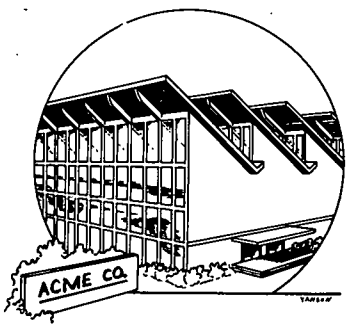


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	La Quinta Motor Inn Solar Hot Water Preheater

A liquid flat plate collector provides preheat for this motel's domestic hot water needs with an electric boiler for backup and an insulated steel water tank for storage. The system also has a hybrid drain down system that utilizes a heat exchanger to prevent the buildup of mineral deposits in collector passages.

Organization	La Quinta Motor Inns
Address	4874 Old National Highway College Park, GA 30337
Contact	La Quinta Motor Inns
Telephone	(404) 768-1241
Funded By	DOE
Cost	$39,329
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Solar Office Building

The solar collectors for this office building consist of 115 modules arranged in five rows. The collector array, supported by a steel frame, faces south at an angle of 45 degrees. The 2,000 sq. ft. of solar collectors and 2,400 sq. ft. of reflectors heat and cool the 7,500 ft^2 office space.

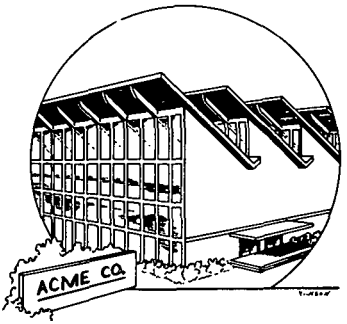
The system employs an automatic drain down as protection from freezing. Through a heat exchanger, the solar heated water is used to heat the building and provide domestic hot water.

Heated water not used during the daylight period is stored in an insulated 3,000-gallon tank. Cooling is accomplished by a solar hot water-powered absorption chiller. The chilled 45 degree F water is used to directly cool the building, or is held in an insulated 6000-gallon storage tank for later use.

The APDC solar system has operated continuously for eight months with a total down time of approximately a week. During the eight month period, the system has either effectively delivered the required heating or cooling from solar or from the back-up system. In one instance, during which the boiler was inoperative, heating was provided exclusively by the solar system.

Critique/analysis: The most significant problems encountered during the initial operating period were the freezing of the collectors, the failure of the main circulation pump motor, and malfunction of the ignitor transformer on the boiler. Most problems, with the possible exception of the freeze damage to the collector, appear to be material failure and not associated with any design inadequacy. Some problems have developed in the electronic controls but are being resolved.

Organization	North Georgia Area Planning & Development Commission
Address	503 West Waugh Street Dalton, GA 30720
Contact	George Sutherland
Telephone	(404) 259-2300
Funded By	DOE ($113,777) Private ($170,123)
Cost	$283,900
Congressional District	IX
Compilation Date	February 1980

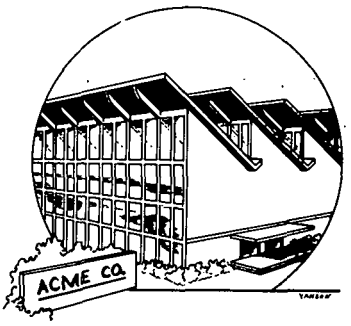


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Solar Orthodontic Clinic

A system of liquid flat plate collectors preheats water for a hot water heater in Dr. Ovellette's orthodontic clinic.

Organization	Dr. Paul Ovellette
Address	130 Huntcliff Pt., N.E. Atlanta, GA 30338
Contact	Dr. Paul Ovellette
Telephone	(404) 942-1500
Funded By	Private
Cost	$4,500
Congressional District	VI
Compilation Date	February 1980

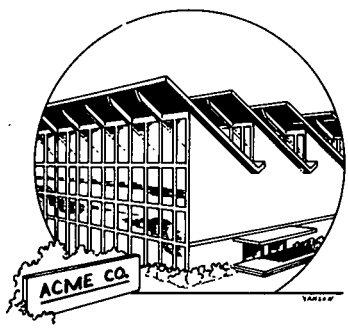


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Solar Warehouse

Liquid flat plate collectors provide domestic hot water and a minimal amount of space heating for this company's warehouse. The installation is intended to serve as a demonstration of solar equipment and means of installation.

Organization	McKinney & iates, Inc.
Address	535A Morosgo Dr., NE Atlanta, GA 30324
Contact	William McKinney
Telephone	(404) 261-4175
Funded By	Private
Cost	n/a
Congressional District	V
Compilation Date	February 1980

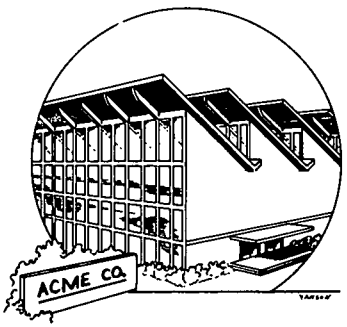


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Southwest Plumbing & Heating Solar Hot Water Heater

Liquid flat plate collectors provide 100 percent of the domestic hot water needs of the business. The owner reports, however, that the demand for hot water is small, making it possible to use only sunlight for water heating.

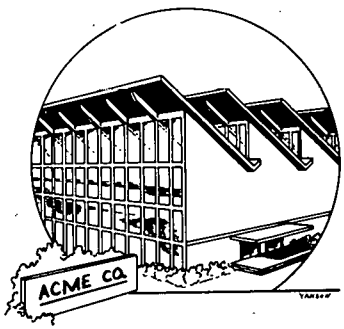
Organization	Southwest Plumbing & Heating
Address	4735 Bakers Ferry Rd. Atlanta, GA 30336
Contact	Southwest Plumbing & Heating
Telephone	(404) 696-3122
Funded By	n/a
Cost	n/a
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	Toyota Dealership Solar Hot Water Heater
Organization	Toyota Dealership
Address	2350 Brown Bridge Rd. Gainesville, GA 30501
Contact	Milton Martins
Telephone	(404) 534-7660
Funded By	Private
Cost	$2,500
Congressional District	IX
Compilation Date	February 1980

Liquid flat plate collectors provide 100 percent of the domestic hot water needs of this company. An electric hot water heater was installed as a back-up, but is not used.

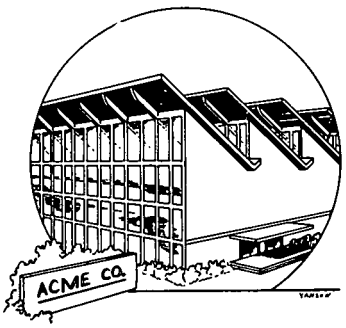


Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	GA
Project Name	WDGL: Solar Assisted Radio Station

Liquid flat plate collectors provide space heating for 90 percent of the domestic hot water needs (100 percent during summer months) for the radio studios. The system has produced a 40 percent savings in total utility bills.

Organization	WDGL
Address	8470 Hospital Dr. Douglasville, GA 30134
Contact	Phil Thompson
Telephone	(404) 942-5186
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	GA
Project Name	Club of 1000

The Club of 1000 is a non-profit corporation uniquely formed for the construction of an all passive (natural) 85 percent self-sufficient pedestrian solar agrarian village that will include 1000 privately-owned and operated living/working units. Each unit will consist of a housing element; a shop, office, or workspace; a greenhouse or other passive systems to provide private heating and cooling as well a private food production; and private courts, terraces, and balconies.

Currently the Club is in a planning and organizing stage, and hopes to begin purchasing land in 1980.

The village will contain community buildings, motor pools, a radio station, a newspaper, a bank, etc., as well as corporate-owned, agriculturally productive land, recreational lands, etc. The community will be situated upon a land area of 1000 to 3000 acres.

Participatory membership costs $1000 and entitles the member to one share of the corporate ownership (limited to 1000 shares: its one share per household or individual), and a 2000 ft^2 are for a living-working unit. Lot choice (limited to 1000) priority will be established by the order of joining the participatory membership or by drawing lots. Voting rights are reserved to participatory members.

Organization	Club of 1000
Address	464 Emory Circle, NE Atlanta, GA 30306
Contact	George Ramsey
Telephone	(404) 894-3849
Funded By	$1,000 Membership
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

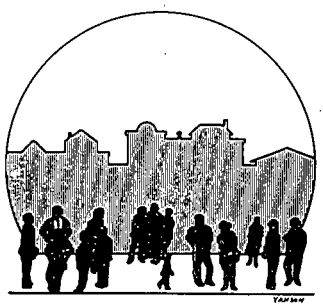
Category	Community
State	GA
Project Name	Experimental Energy Environment, Inc.

In August of 1977, a small group of families formed Experimental Energy Environment, Inc., buying 116 acres of land in Newton County for use as a land preserve and a location for building structures and devices that use renewable energy. To date, the group has constructed a solar greenhouse (made from recycled materials), and a handcrafted wooden yurt.

The community also has an organic garden, a composting toilet, a brick-maker ram, several wood stoves, and a hydraulic ram that uses hydropower to irrigate the garden.

Organization	Experimental Energy Environment, Inc.
Address	Route 1, Box 117 Covington, GA 30209
Contact	Perry Treadwell Gilbert Treadwell
Telephone	(404) 786-1139

Funded By	$90/mo. membership dues
Cost	Available upon request
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

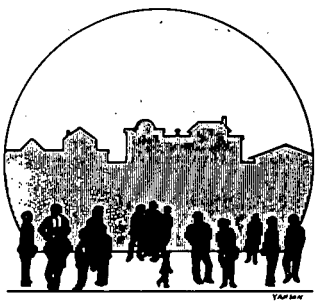
Category	Community
State	GA
Project Name	Koinonia Planned Community

Koinonia is a non-profit Christian community that now occupies 1,367 acres in rural south Georgia.

Partners and volunteers at Koinonia work on a successful organic farm, growing corn, soybeans, peanuts, grapes, and pecans, or in a food-processing and mailing center. Two housing developments, with a total of 50 houses, have been constructed primarily for low income people who work in the community. The houses range in cost from $12,000 to $15,000. Koinonia also conducts ferrocement experimentation.

Koinonia has a solar-heated house which uses a passive water wall, a solar grain dryer, a large parabolic focusing collector that provides much of the heat for their commercial oven, and several low-cost residential water heaters.

Organization	Koinonia Partne__
Address	Route 2 Americus, GA 31709
Contact	Roger Demprey
Telephone	(912) 924-0391
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	GA
Project Name	Mead Road Center Solar Demo

The Mead Road Center Solar Demonstration Project held a series of "hands on" workshops to demonstrate two low-cost solar applications--a solar greenhouse and a breadbox water heater--that are simple enough to be duplicated by members of the community.

In addition, the project served as a community catalyst by bringing people together for a project that could enhance their quality of life and provide opportunities for neighborhood self-reliance and economic development.

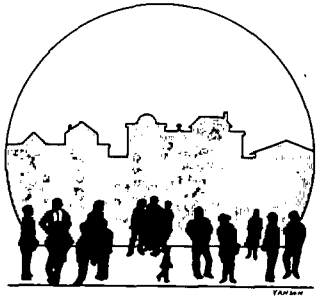
The original design called for a 7.5' x 24' greenhouse to be attached to the south wall of the building. However, because of a building code restriction, the greenhouse could not be sited along the preferred south wall, but instead was constructed as an extension of the south building line on the west side. A north wall was constructed of 2" x 6" lumber, and was heavily insulated with six inch fiberglass batts. The structure cost $510 to build.

Five water-filled 55-gallon drums that had been painted black provide thermal mass for the greenhouse. The drums stabilize the temperature inside the greenhouse, provide warmth at night during the winter, and absorb excess heat during the daytime in summer. In addition, a large pecan tree provides summer shade from late April to mid-November

project was sponsored by the City of
Dec with Community Development funds.

The breadbox solar water heater, built for $168, is located along the south side of the building and utilizes a 30-gallon tank as a collector surface. Insulating panels reflect light onto the tank. The panels are manually closed at night or during inclement weather to prevent heat loss.

Organization	Mead Road Center
Address	135 Mead Road Decatur, GA 30032
Contact	Rick Huber
Telephone	(404) 373-8950
Funded By	City of Decatur Community Development Funds
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



The solar water heater acts as a pre-heat tank. Cold water from the city line goes into the bottom of the tank of the solar heater where it is warmed to approximately 130° F. Water pressure from the city line forces the heated water into the existing hot water heater, which acts as an auxiliary system.

Payback calculations for the solar greenhouse and breadbox water heater are difficult to perform. Because of its west facing orientation, the greenhouse contributes minimally to the heating needs of the building. However, the greenhouse does reduce heat loss from the house and buffers a section of the building from the prevailing winter winds. However indirect benefits have been gained by the solar greenhouse and breadbox water heater workshops. Approximately 50 people participated in the workshop series. Interest in solar energy and in energy conservation was stimulated in these participants as well as throughout the community. The workshops also served to provide basic information on solar technologies and to strip away some myths about solar energy.

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	GA
Project Name	Shenandoah Solar Recreation Center

Organization	Shenandoah Development Corporation
Address	P.O. Box 1157 Shenandoah, GA 30265
Contact	Ray Moore, Sr.
Telephone	(404) 253-8242

Funded By	ERDA ($778,000)
Cost	$2.4 million (total project)
Congressional District	VI
Compilation Date	February 1980

One of the largest buildings in the world to be heated and cooled by the sun, the Shenandoah Recreation Center is a Georgia Institute of Technology designed, evaluated and computer-modeled multi-purpose community facility that includes a complex of offices, seminar rooms, ice skating rink, gymnasium, theater, game rooms, and swimming pool. The Energy Research and Development Administration (DOE) funded the $778,000 solar portion of the costs of the construction of the $2.4 million complex, which was designed by Georgia Institute of Technology. Construction was completed in April of 1977.

The building is partially underground and occupies a total of 59,000 sq. ft of which 58,000 sq. ft. are air conditioned. The roof of the center is covered with 10,500 sq. ft. of flat plate solar collectors, which are augmented by 14,000 sq. ft. of polished aluminum reflectors.

The individual 21' x 8' solar collector modules are factory assembled for lower rooftop installation costs, and yield temperatures up to 200 degrees F.

Air conditioning is provided by a 100-ton lithium-bromide absorption chiller. In the autumn and spring, heat from the solar collectors not needed for space heating, cooling or hot water is used to heat an outdoor, olympic-sized s .ng pool. Other energy-saving design j :es include a square building configuration, a highly reflective aluminum roof design, limited glass area, twenty insulated skylights, and mercury vapor lights (where possible).

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	GA
Project Name	Solar Heated Pool

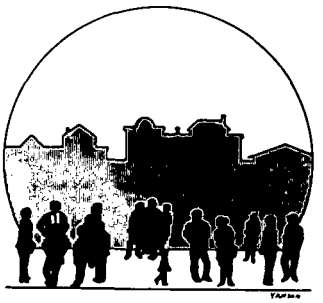
The Bernie Ward Community Center is adding a swimming pool complex that has a solar water heating system for the Junior-Olympic size swimming pool, and a separate solar system for the Center's domestic hot water.

The construction cost for the pool complex is $300,000, which includes the $50,000 cost of the solar systems. A matching funds grant for the pool complex was received from the Heritage Conservation Recreation Service.

Heated water for the pool and domestic uses will be provided by 64 single-glazed, copper-plate collectors. The collectors array (4' x 10') was designed to maximize available surface area. The domestic hot water system will have a 120-gallon storage tank that will serve as a pre-heat system for an electric hot water unit.

Pool construction is currently underway, and construction of the solar systems is expected to be completed by March.

Organization	Bernie Ward Community Center
Address	9475 Lumpkin Road Augusta, GA 30906
Contact	Tom Boyles
Telephone	(404) 798-3750
Funded By	Heritage Conservation Recreation Service Matching Grants
Cost	$300,000
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Bacteria Research

These researchers have isolated a strain of bacteria which offers advantages over yeast in the fermentation of glucose to ethanol. The newly isolated bacterium is anaerobic (it grows in the absence of oxygen) and thermophillic (lives in relatively high temperature). It is found in Yellowstone Hot Springs where the temperature averages 158°F.

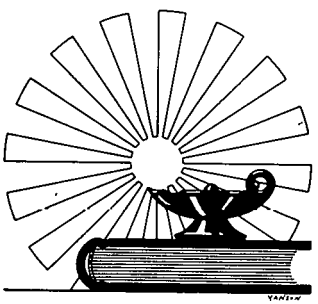
The high temperature allows ethanol to be distilled during fermentation, which is completely anaerobic, thus using less sugars for growth than partly aerobic fermentation by yeast. The bacterium also ferments a number of different sugars that yeast does not.

University of Georgia researchers also found that, by coupling the bacterium with a thermophillic cellulose-degrading bacterium, it is possible to ferment cellulose, paper, or paper products to ethanol at temperatures above 140°F. The two bacteria would be put into the mixture. One breaks down the cellulose to cellobiose and glucose, and the alcohol bacterium continues the process and produces ethanol.

This means that it would be possible to produce ethanol from various wood products, providing a use for paper products that now wind up in garbage dumps, or for wood waste that is left over from lumbering operations.

Organization	University of GA
Address	Dept. of Biochemistry Athens, GA 30602
Contact	Dr. Lars Ljungdahl
Telephone	n/a

Funded By	DOE
Cost	n/a
Congressional District	X
Compilation Date	February 1980

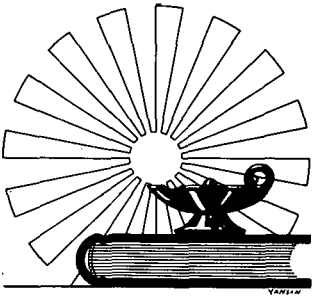


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Brunswick Job Corps Solar Training Program
Organization	Brunswick Job Corps
Address	Glynco Industrial Park Brunswick, GA 31520
Contact	David Pate
Telephone	(912) 264-8843
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

A solar training program funded through the Department of Labor's Job Corps Program is being instituted in Brunswick. The program will train economically disadvantaged men and women (age 18-21) to install solar domestic hot water and swimming pool heating systems. Participation in the solar energy course is voluntary. Students come from households with average incomes below the poverty level.

The training program will use classroom lectures, and audio-visual materials to give students a basic theoretical knowledge of solar energy application. Later the students will be instructed in installation practices and will receive hands-on experience. Job placement services will be provided to students completing the program.



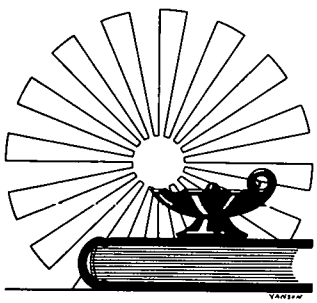
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Energy Conserving Community Research

A 235-acre Energy Conserving Community Site is being studied by a multi-disciplinary team directed by Georgia Tech. Sponsored by the Department of Energy, the project aims to create savings by community-wide energy-cautious land and building design.

The study is examining the life-cycle costs of conventional, passive, and central utility site plans with different landscaping, construction, and HVAC systems.

Organization	Shenandoah Development Corporation
Address	P.O. Box 1157 Shenandoah, GA 30265
Contact	Ray Moore, Sr.
Telephone	(404) 253-8445
Funded By	ERDA ($778,000)
Cost	$2.4 million (total project)
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	GIT Solar Research

Organization	Georgia Institute of Technology (GIT)
Address	Office of Publications & Information Engr. Experiment Station Atlanta, GA 30332
Contact	Peggy Brown
Telephone	(404) 894-3405

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

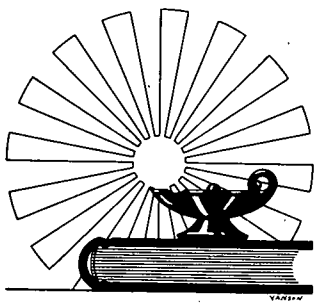
For several years the Georgia Institute of Technology has been a leader in solar energy research.

In 1974 the National Science Foundation contracted with Georgia Tech and the Martin Marietta Corp. to design and build the United State's first large solar steam generator. The purpose was to acquire design information and operating experience with a solar steam boiler for applications in producing electricity.

Construction of the one megawatt solar steam generator was completed in 1976. The boiler was then shipped to France and tested during the summer of 1976, where the boiler generated steam at 1250 pounds per square inch and 950°F with a flow rate of 2700 lbs. per hour. This steam output would have been sufficient to generate approximately 300 kw of electricity, enough for 30 average homes.

A small solar furnace (9½' x 9½'), is located on the Tech campus. The flat mirror reflects solar radiation into a 62 in. parabolic cencentrator, yielding up to 2000 watts of energy.

Other tech research projects include a 400 kw solar thermal test facility, funded by the Energy Research and Development Administration (now Dept. of Energy) that has been constructed on the Tech campus. The STTF utilizes 550 round mirrors 43.7 inches in diameter which focus on a test area centrally located 72 ft. above the mirror field. The STTF provides a place to evaluate experimental solar thermal conversion components, other heat exchanger devices, and to perform research in areas such as metals, ceramics, coatings, and chemical synthesis.



Testing another aspect of high temperature solar application, Georgia Tech is conducting research on a 2-megawatt thermal storage system. Molten inorganic salt mixtures are to store heat at 850°F while a hydro- on is being tested to store heat at 570°F.

Two solar collector systems under development at Georgia Tech are for the production of process heat. One utilizes a fixed mirror concentrator and is composed of long narrow flat mirror facets arranged on a concave cylindrical surface. The surface area of the experimental model is 61 sq. ft.; peak thermal collection capability of the concentrator is 10,000 BTU per hour.

Another system also utilizes a linear heat exchanger, but it is illuminated by rotating facets. Each facet is oriented at the appropriate angle to reflect sunlight onto the heat exchanger pipe. As the earth turns, a single bar rotates each facet the same amount so the sunlight remains focused on the heat exchanger.

Tech researchers were also involved in the design and construction of solar heating systems for a couple of poultry grow-out houses.

In Villa Rica, a poultry house was retrofitted with a roof-top solar heating system providing 12% of the heating during a grow-out period from October 13 to December 1, 1977.

Solar drying of tobacco, peanuts, and grain are also currently being tested by Georgia Tech researchers in efforts to improve methods of agricultural drying. Three types of collectors being investigated are the hot air ctor, the rock collector and the water ctor.

Research in wind energy conversion systems at Georgia Tech began in 1974 with a cost-benefit methodology study for NASA on the application and use of wind generators. Research included a survey and analysis of surface winds, regional topographical features and monthly averages. Ongoing work involves a 15 kw wind turbine generator located on the Tech campus.

Because of the vastness of Georgia's forests, Tech has also performed substantial research on biomass. Researchers estimate that wood can provide 5 to 11% of the state's 1900 energy requirements. Methods of utilizing wood as an energy source include direct combustion, gasification, fermentation or pyrolysis.

One venture showing great potential for reducing the energy needs of Georgia's industry is Georgia Tech's Industrial Energy Extension Service (IEES), a four year program sponsored by Georgia's Office of Energy Resources. IEES hopes to reduce the needs of Georgia's industries by 10 to 20% from their projected 1980 requirements by assisting plant management at selected plants in conducting energy surveys and making recommendations on ways the surveyed plants can save energy.

Renewable Resources— A National Catalog of Model Projects

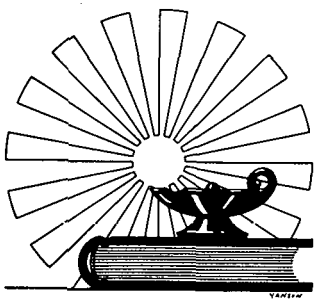
Category	Education
State	GA
Project Name	Offender Solar Training
Organization	Dept. of Offender Rehabilitation
Address	Voc. Ed. Services 800 Peachtree St. Atlanta, GA 30308
Contact	Iris Burch
Telephone	(404) 894-5355
Funded By	CETA
Cost	$35,000
Congressional District	VI
Compilation Date	February 1980

The Vocational and Educational Services division of the Georgia Department of Offender Rehabilitation is beginning a program to conserve energy and at the same time to train inmates in the construction and installation of domestic solar water heating systems. Funded by a $35,000 grant from CETA, the division is adopting an existing training curriculum developed by the Georgia Institute of Technology to the specific needs of the vocational/educational program.

Inmates participating in the training program at the Macon Correctional Center will construct 50 single-glazed 6½' x 3' flat plate collectors. Later in the spring of 1980, inmates will install several of the collectors on two housing units at the Lee Correctional Institute in Leesburg, Georgia.

Collector performance will be monitored over four months and a cost comparison will be done comparing the energy savings of the solar units to four adjacent housing units with oil-fired hot water systems. Results of the performance evaluation and cost comparison will be available from the Vocational/Educational Services division.

Funding for the project ends in September of 1980. However, plans are underway to seek additional funding to expand the solar program to other state correctional institutions, to incorporate the solar program into the ...litional heating and cooling systems ...riculum offered by the division.



Renewable Resources—A National Catalog of Model Projects

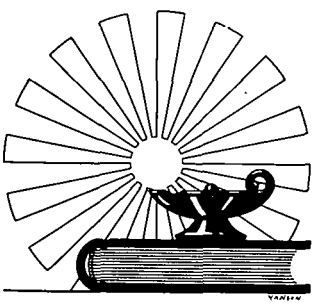
Category	Education
State	GA
Project Name	SMW Solar Training Center

As part of the Union's National Training Program, a new building will be built at 1838 Stewart Avenue in Atlanta. The building will use a hydronic solar system for its hot water needs, and an air type system for space heating.

For at least the next ten years (grant requirement) the building will be used for training contractors, instructors, and apprentices in solor.

Project funding for six other solar training centers throughout the United States, totalling $1.5 million, is from the Sheetmetal Workers Union.

Organization	Sheet Metal Work___ Union (SMW)
Address	1838 Stewart Ave., SW Atlanta, GA 30315
Contact	Jim Davis
Telephone	(404) 758-2689
Funded By	Sheet Metal Workers
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Solar Appliances for the Poor

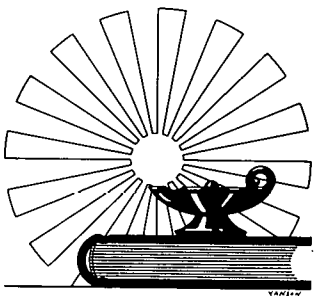
The South Georgia Community Action Council is conducting experiments to find a combination of materials for use in a low-cost, yet long-lasting solar hot water heater systems for the area's low-income citizens.

Many cost-saving measures were taken; for example, experiments revealed that double glazing on the collectors caused excessively high water temperatures. The council built many different panels to discover what type of collector would work best in the warm Georgia climate. The optimal model, these tests showed, is a 32 ft^2 panel that is hooked up to the home's existing hot water storage tank. The system costs $300, and it will produce enough hot water for a one-to-two person dwelling.

The prototype system has been working well at a local technical school. Soon the systems will be installed and monitored on actual homes.

Organization	Southwest Georgia Community Action Council, Inc.
Address	P.O. Box 11219 Moultrie, GA 31768
Contact	Robert J. Clinton
Telephone	(912) 985-3610
Funded By	National Center for Appropriate Technology
Cost	$5,000.00
Congressional District	II
Compilation Date	February 1980

(Information concerning this project was made available to the Center by the ·onal Center for Appropriate nology.)



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Solar Efficiency Research

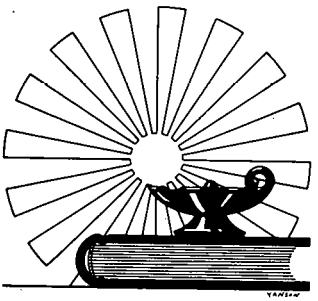
The Macon Housing Authority participated in a National Aeronautics and Space Administration (NASA) project to install active solar domestic hot water systems in residences for monitoring and evaluation. In Macon, a hot water system was installed in a single family unit of a public housing project.

Energy consumption was monitored for a two-year period with data on temperature and useage fed directly to the Huntsville, Alabama NASA center via a telephone line. Monitoring of the system has been discontinued but the system is still in operation and works without any major problems.

The Macon Housing Authority is continuing their interest in solar applications. They feel the project was successful, particularly in familiarizing their maintenance crew with general maintenance of the system.

Organization	Macon Housing Authority
Address	Box 4928 Macon, GA 31208
Contact	Hozan Buford
Telephone	(912) 746-8151

Funded By	n/a
Cost	n/a
Congressional District	VIII
Compilation Date	February 1980

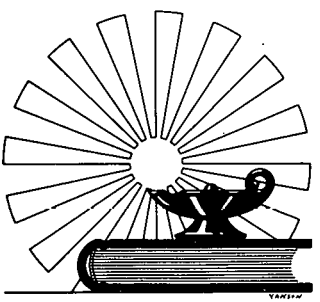


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Solar System Sizing

Lennox has offered a course on solar system sizing techniques for salesmen and semi-technical personnel. Another course on solar system maintenance and installation has been offered for installers and maintenance personnel.

Organization	Lennox Industries
Address	2915 E. Ponce de Leon Ave. Decatur, GA 30030
Contact	Rick Niles
Telephone	(404) 377-5511
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Solar Technician Training Program

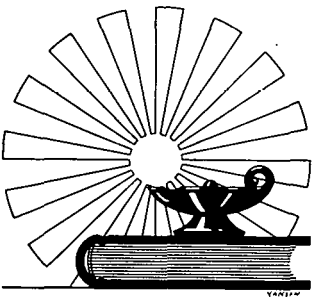
A 150-hour curriculum has recently been developed by the Georgia Department of Education working in conjunction with the Engineering Experiment Station at Georgia Institute of Technology. The curriculum is offered in 19 vocational-technical schools through-out Georgia as an option to graduates of the school's heating, ventilating and air conditioning training programs.

The curriculum is designed to train technicians in the state in Solar Energy covering systems design, construction, on, installation, maintenance and sales (including both commercial and residential applications).

A training program for instructors was conducted at Georgia Tech and instruction in the Vo-Tech schools began in September 4, 1979. No students have yet graduated from the program.

Organization	GA Dept. of Education
Address	GIT Engineering Experiment Station Atlanta, GA 30332
Contact	Bob Mabry
Telephone	(404) 656-2547

Funded By	n/a
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Solar Windowbox Workshop

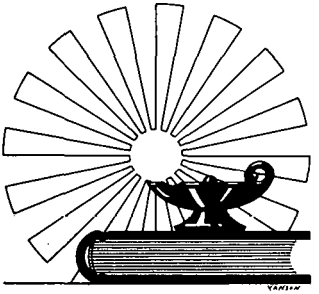
The North Decatur Presbyterian Church co-sponsored a "hands-on" solar windowbox workshop with the Georgia Solar Coalition, a non-profit public interest group. The windowboxes are attached to a resettlement house for Cambodian families. Members of the church worked with coalition members and technical consultants on designing, constructing and installing two windowbox units.

The windowbox units consist of a wooden rectangular box, insulated on the botton and three sides with a glass top cover and two air vents at one end. Inside the box is a piece of black sheet metal to absorb sunlight. Cost of the materials for each box was approximately $50.

The boxes weigh approximately 100 lbs. each, and can be handled by two people. Each box leans against the outside of the house so that the air vents extend through a window. Air leaks are sealed off around the vents.

The solar windowbox works on the termosiphoning principle. Cold air is drawn from the floor area of the room into the box, first underneath the sheet metal, then over the top. The air is warmed as it passes over the surface of the sheet metal and then is vented back into the room.

Organization	North Decatur Presbyterian Church
Address	611 Medlock Road Decatur, GA 30033
Contact	Henry Slack
Telephone	(404) 377-8931
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

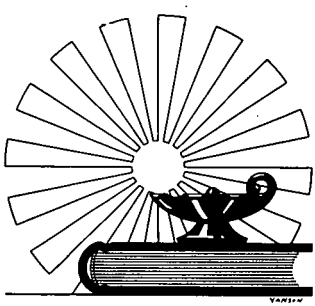


Renewable Resources—A National Catalog of Model Projects

A joint project with NASA and the Coweta County School System has resulted in construction of an all-air collector system with rock storage for two homes in Shenandoah. The residences will be monitored and studied by vocational students from the school system.

Also, NASA selected Shenandoah for demonstrating residential cooling with the Rankine cycle.

Category	Education
State	GA
Project Name	Vocational School Solar Project
Organization	Shenandoah Development Corporation
Address	P.O. Box 1157 Shenandoah, GA 30265
Contact	Ray Moore, Sr.
Telephone	(404) 253-8445
Funded By	ERDA ($778,000)
Cost	$2.4 million (total project)
Congressional District	VI
Compilation Date	February 1980



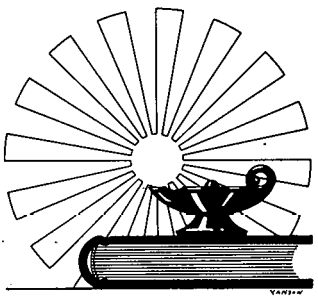
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	GA
Project Name	Wood Burning Exhibits

The Georgia Forestry Commission conducts educational exhibits on wood energy. The exhibits, in use for 18 months, are housed in two 12' x 40' trailers. On display are various makes of wood stoves and wood-burning furnaces. Educational materials on heating with wood, proper system installation, and wood-stove maintenance are also available. Forestry Commission staff members accompany the exhibit, which has been to more than 100 cities in Georgia.

The Commission has also developed a mobile unit that produces three million Btus of heat. This unit is being offered to farmers for use in drying their crops, displacing expensive propane.

Organization	Georgia Forestry Commission
Address	P.O. Box 819 Macon, GA 31201
Contact	John Mixon, Research Chief
Telephone	(912) 744-3353 (GA Forestry Commission)
Funded By	Georgia Forestry Commission
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

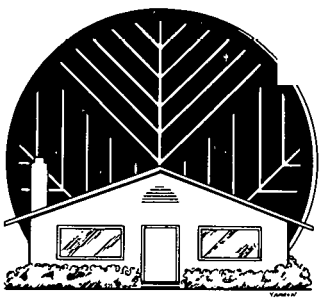


Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Adams Residence Active Solar Hot Water Heater

Liquid flat plate collectors provide a pre-heat domestic hot water system that supplies 40-50 percent of the home's annual hot water needs. An electric hot water heater provides back-up.

Organization	Ronnie Adams
Address	Route 1 Murryville, GA 30564
Contact	Ronnie Adams
Telephone	(404) 864-6665
Funded By	Private
Cost	$1,000
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Albany Housing Authority

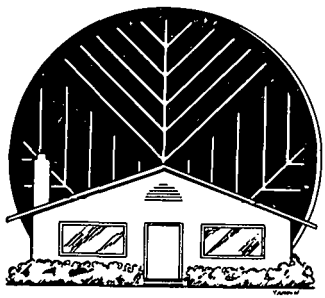
In 1951, 390 passive solar domestic hot water heaters were installed in three housing projects. Each unit consists of a flat plate collector, mounted on the roof and connected to an 80-gallon water tank in the attic of each unit.

Glycerin carries heat from the collector to the tank. Electric resistance elements provide backup heat.

It is not known what percentage of the load is met by solar, but the units have been in continuous operation since 1951. Only 12 have required service; however, several collectors need glazings replaced.

The cost for the solar heating system was $350/apartment which was part of the construction cost financed by HUD and repaid by a local bond issue.

Organization	Albany Housing Authority
Address	Post Office Box 485 Albany, GA 31702
Contact	Harvey Pate
Telephone	(912) 436-2494
Funded By	*HUD: repaid by local bond issue*
Cost	$350 per unit installed
Congressional District	II
Compilation Date	February 1980



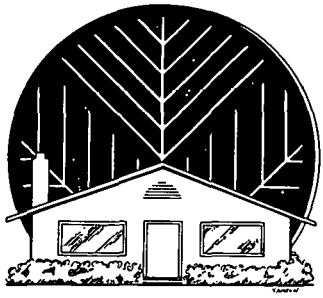
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Barnett Residence: Active Solar Space Heating System

Flat-plate solar collectors provide space heating for this 2,427 ft^2 house. Heating of the house is accomplished by circulating hot water through radiating pipes in the living space. Supplemental heating is provided by a fireplace fitted with a heat exchanger grate, which can be used to warm the water circulating through the radiators. An electric resistance heater, also capable of heating circulating water, is a backup system.

During the warmer months of the year, a high-efficiency electric water chiller is used to cool the water flowing through the radiating pipes. A composting toilet provides a waterless method of treating organic household wastes.

Organization	Billy Barnett
Address	Kathleen, GA 31047
Contact	Billy Barnett
Telephone	(912) 987-0503
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Bradley Residence: Active Solar Preheat System

A system of liquid flat place collectors serves as a means of preheating domestic hot water before it enters a conventional electric hot water heater. The system supplies 50 percent of the domestic hot water in the summer, and 33 percent during the winter months.

Critique/analysis: There have been some problems with the system controls.

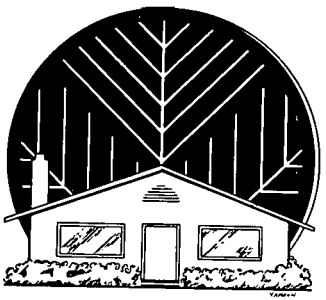
Organization	David Bradley
Address	117 Allison Circle Cartersville, GA 30120
Contact	David Bradley
Telephone	(404) 382-7329
Funded By	Private
Cost	$1,200.
Congressional District	VI
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Brandstedter Residence: Active Solar Hot Water and Space Heating System
Organization	C. Brandstedter
Address	154 Ridgewood Dr. Woodstock, GA 30188
Contact	C. Brandstedter
Telephone	(404) 926-2809
Funded By	Private
Cost	$3,700
Congressional District	IX
Compilation Date	February 1980

Installed in a new home two years ago, this system uses four flat plate collectors, coupled with a heat grate in the fireplace, to provide domestic hot water and space heating. The amount of space heating provided by the system depends on how frequently the fireplace is used.

Critique/analysis: Initially the system was poorly installed but it has been reworked, but is still functioning unsatisfactorily. Because of poorly applied caulking--faulty flashing--there is severe roof leakage.



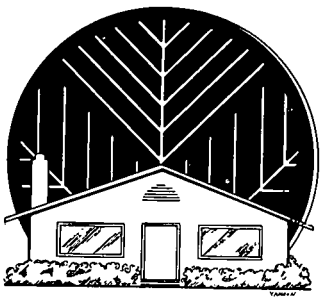
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Burdett Residence: Active Solar Space Heating System

Over 280 sq. ft. of liquid flat plate collectors provide 75 percent of the space heating requirements of the Burdett house. Heat stored in an insulated water tank is distributed through the house via fan coil in the duct work. A gas furnace provides back-up heat.

The system became operative in November of 1979. The owner is reportedly pleased with its performance.

Organization	Charles Burdett
Address	117 Jenifer Lane Lilburn, GA 30247
Contact	Charles Burdett
Telephone	(404) 923-1132
Funded By	Private
Cost	$8,000
Congressional District	IX
Compilation Date	February 1980



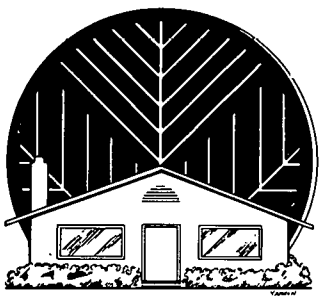
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Carter Residence: Active Solar Heating System

The south side of Lenard Carter's roof is covered with 800 sq. ft. of fiberglass glazing. The roof admits sunlight to an insulated black attic space. Warm air is then drawn down from the space in to a rock bed, where it is stored.

Carter estimates that his solar system provides 80 percent of the heating needs for his 2,600 ft^2 house. His average heating bill is only $17.00/mo.

Organization	Lenard Carter
Address	114 Ole Hickory Trail Carrolton, GA 30117
Contact	Lenard Carter
Telephone	(404) 834-3523
Funded By	Private
Cost	$12,500
Congressional District	VI
Compilation Date	February 1980



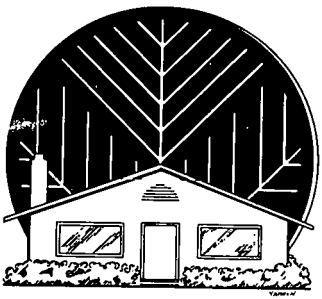
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Cline Residence: Passive Solar Hearth

In a 1,000 ft^2 addition to their existing house, the Clines have built what they call a solar hearth. Sunlight passing through large south facing windows falls on a massive masonry fireplace, which serves as the thermal storage mass of the house and radiates heat to the rooms which adjoin the fireplace. When wood is burned in the fireplace, this also serves to warm the thermal mass, which then gives off heat to the rest of the house.

Critique/analysis: Some small cracks have developed in the masonry due to heating.

Organization	The Clines
Address	Route 1 Social Circle, GA 30279
Contact	The Clines
Telephone	(404) 786-7821
Funded By	Private
Cost	n/a
Congressional District	X
Compilation Date	February 1980

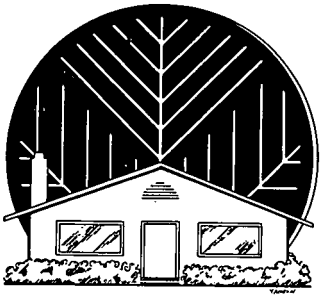


Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Cochran Residence: Active Solar Hot Water and Space Heati System

The Cochrans, a retired couple, have just installed 24 liquid flat plate collectors on their house to provide space heating and domestic hot water. Supplemental heating is supplied by electric central heat. No performance figures are available yet, as the installation has just been completed.

Organization	The Cochrans
Address	1755 Birmingham Rd. Alpharetta, GA 30201
Contact	The Cochrans
Telephone	(404) 475-5112
Funded By	Private
Cost	$13,500
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Connor Residence: Active Solar Hot Water and Space Heating System

Two-hundred and fifty sq. ft. of liquid flat plate collectors will provide space heating and domestic hot water in this new house. The collectors are drained when not in use to protect them from freezing.

The system was installed by the owner. No performance figures are available at the present time.

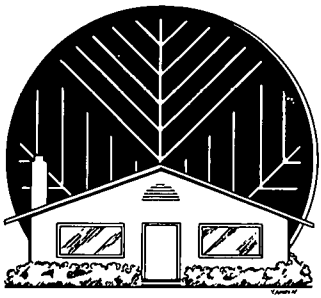
Organization	Steven S. Connor
Address	Highway 129 North Fitzgerald, GA 31750
Contact	Steven S. Connor
Telephone	(912) 423-3276
Funded By	Private
Cost	$2,200 (materials)
Congressional District	VIII
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Cook Residence: Active Solar Preheat System

Liquid flat plate collectors preheat domestic hot water for an electric hot water heater, thereby reducing the Cook's total electric bill by 15-20 percent. The system provides 80 percent of the family's domestic hot water.

Organization	Tim Cook
Address	30 Nature Creek Milledgeville, GA 31061
Contact	Tim Cook
Telephone	(912) 452-1807
Funded By	Private
Cost	$1600
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

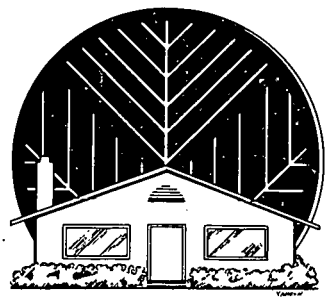
Category	Housing
State	GA
Project Name	Crystal Lake Apartments: Active Solar Preheat System

A system of liquid flat plate collectors provides heat to a domestic hot water preheat system in this 80-unit apartment complex.

A gas fluid boiler provides the additional required heat. In spite of some problems with the control systems, 20 percent savings in fuel bills have been realized.

Organization	Crystal Lake Apts.
Address	Chamber's Road Macon, GA 31210
Contact	George Hayes
Telephone	(912) 788-8777

Funded By	HUD Grant $140,000 Private $ 5,000
Cost	$145,000
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Debo Residence: Hybrid Solar System

This two-story house is heated in part by passive design that allows the sun to enter through large south-facing window areas.

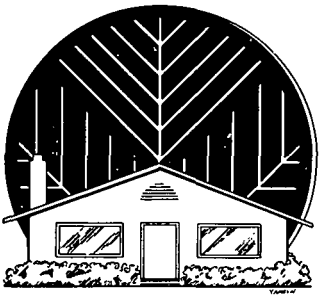
The active system is composed of black metal panels covered by a layer of glass that slopes out in front of the house.

Air is blown across these metal plates, where it picks up heat. This hot air is then blown through a bin full of rock in the basement, which provides three days of heat storage capacity. Warm air is allowed to rise from the bin into the house by natural convection.

A wood burning stove provides supplemental heat.

Organization	Tom Debo
Address	Morris Landers Dr. Atlanta, GA 30345
Contact	Tom Debo
Telephone	(404) 633-7070

Funded By	Private
Cost	$4,000 (active system)
Congressional District	VI
Compilation Date	February 1980



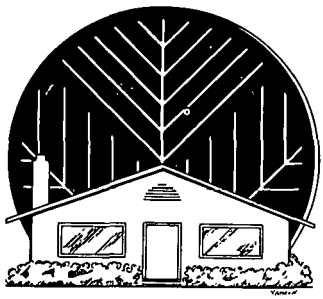
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Dingess Residence: Active Solar Space Heating, Cooling and Preheat System
Organization	The Dingesses
Address	11507 Buckthorn Dr. Shenandoah, GA 30265
Contact	The Dingesses
Telephone	(404) 251-3846
Funded By	HUD
Cost	$11,500
Congressional District	VI
Compilation Date	February 1980

This 1,216 ft^2 house, built during the first HUD grant cycle, obtains space heating, cooling and preheated domestic hot water via solar energy.

Heat is collected using 273 sq. ft. of liquid flat plate collectors built into the south-facing roof of the house. Heat is either stored in an insulated 2,000-gallon storage tank in the basement, or is distributed through the house via a fan coil in the house's duct system. Auxiliary heating is provided by a heat pump.

Cooling is provided by circulating solar-heated water through an absorption chiller which provides cool water for air conditioning.



Renewable Resources—A National Catalog of Model Projects

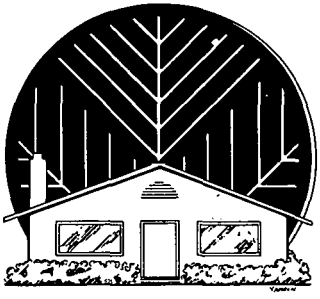
Category	Housing
State	GA
Project Name	Donaldson Residence: Active Solar Space Heating System

Gordon Donaldson has incorporated trickle-type collectors (using silicon oil as the heat-transfer fluid) into his home to provide space heating. The collectors provide 40 percent of the annual space heating requirements.

Donaldson's back-up heating system include a gas furnace and a wood stove.

Critique/analysis. The system is undersized for the house, but otherwise functions adequately.

Organization	Gordon Donaldson
Address	Hapeville, GA 30354
Contact	Gordon Donaldson
Telephone	(404) 872-6310
Funded By	Private
Cost	$16,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

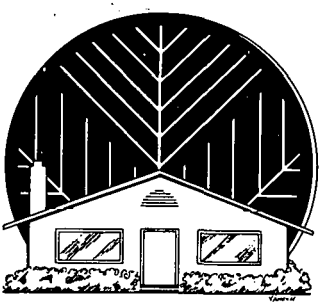
Category	Housing
State	GA
Project Name	EKOSE'A: Passive Solar Home

This passive solar house consists of two insulated shells separated by an air space. The outer shell serves to keep out the elements. The inner shell surrounds the living area of the house.

Heat is collected in a 2-story sunspace that makes up the south side of the house. Warm air rising from the sunspace flows between the two insulated shells, down the north wall, underneath the house in an enclosed crawl space and returns to the sunspace through spaces between the boards of the wooden deck.

During the summer months, warm air from the sun space is exhausted through vents in the roof, creating a flow of air through the living space. The system provides 98 percent of the house's space heating requirements, maintaining the house between 60 and 80 degrees year round.

Organization	EKOSE'A (Architectural firm)
Address	120 North Lake Ln. Canton, GA 30114
Contact	Bridgie E. Stokes
Telephone	(404) 475-0444
Funded By	Private
Cost	$27/ft^2
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

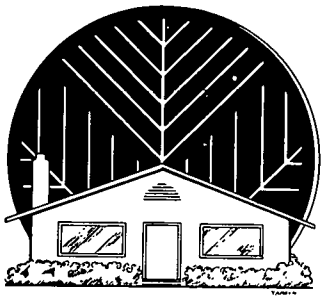
Category	Housing
State	GA
Project Name	Ferguson Residence: Hybrid Solar System

This earth sheltered house obtains 50 percent of its heating from sunlight entering through large south-facing double glazed windows. Supplemental heat is supplied by a wood-burning stove. An active solar domestic hot water heater provides hot water.

The system works well. Average utility bills are $25/month. The only problem to date is with the house becoming too warm when the wood-stove is used.

The house was constructed in November of 1979.

Organization	Mr. & Mrs. William C. Ferguson
Address	10030 Holly Hill Way Jonesboro, GA 30236
Contact	Mr. & Mrs. William C. Ferguson
Telephone	(404) 471-3322
Funded By	Private
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

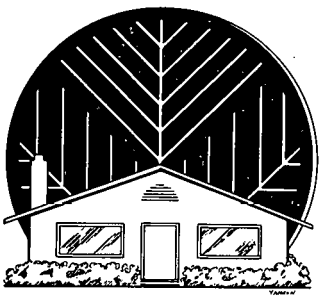


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Giels Residence: Active Solar Hot Water and Space Heating System
Organization	James T. Giels
Address	119 Storey Lane Leesburg, GA 31763
Contact	James T. Giels
Telephone	(912) 288-7250
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The Giels' residence will receive space heat from fixed-mount concentrating collectors consisting of tubes positioned between mirrors and enclosed in 4' x 8' modules. A preheat coil in the storage tank will warm water before it enters a conventional hot water heater.

The house is still under construction.



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Griffen Residence: Active Solar Space Heating and Preheat System
Organization	Allan Griffen
Address	Rt. 1, Box 385 Dallas, GA 30132
Contact	Allan Griffen
Telephone	(404) 445-5552
Funded By	Private
Cost	n/a
Congressional District	VII
Compilation Date	February 1980

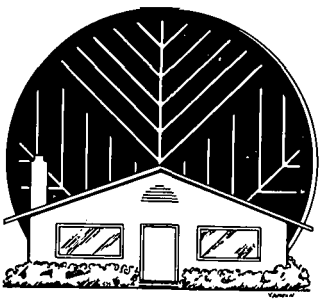
Allen Griffen uses a trickle-type collector that provides for 80 percent of his home's space heating needs. The system also preheats the hot water.

The water from the system is stored in a rock-insulated tank. Air from the house is blown through the rock insulation and into the home.

An oil-fired hot water heater is used as a back-up to warm the water in the storage tank. A wood-burning stove also provides supplemental heat.

During the summer a refrigeration unit is used to chill water in the tank to provide air conditioning.

Critique/analysis: The owner is reportedly satisfied with the system's performance.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Harbour Oaks Apts: Active Solar Space Heating System

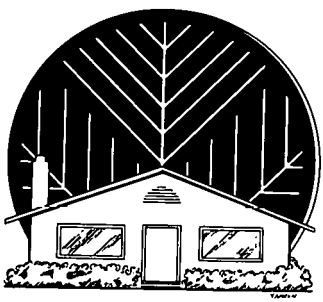
Seven thousand square feet of trickle-type collectors using silicone oil were installed as a retrofit on 40 units totaling 3,950 square feet of living space. The system was designed to supply 89 percent of the space heating requirements, with the remainder supplied by electric resistance heaters. During the summer months the system is used only for domestic hot water.

Forty percent savings in utility bills have been noted.

Critique/analysis: There have been some problems with leaks, particularly in the lines containing silicone oil at threaded or clamped joints. People have not altered energy consumption patterns to take advantage of energy when it is most readily available, thus requiring more auxiliary heating.

Organization	Harbour Oaks Apts.
Address	2505 Lawrenceville Highway Decatur, GA 30033
Contact	Steve Jones
Telephone	(404) 636-9629

Funded By	HUD ($186,000)
Cost	$290,000
Congressional District	IV
Compilation Date	February 1980

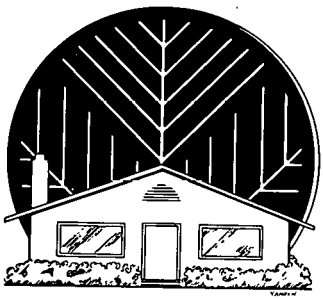


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Hicks Residence : Passive Solar System

This Rabun County passive solar home has a direct-gain heating system with greenhouse. The "thermal mass" storage includes a concrete slab over twelve tons of washed stone.

Organization	John Hicks
Address	Hwy. 76, Clayton, GA 30525
Contact	Randy Schwartz
Telephone	(404) 329-0430
Funded By	Private (materials)
Cost	$9,000
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Johnson Residence: Passive Solar System

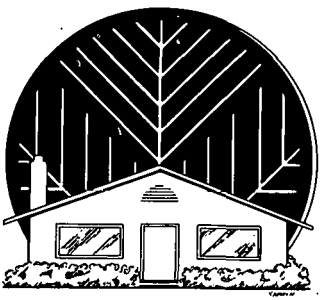
Two and one half years ago, Ken Johnson began remodeling his house with a passive solar design. He began by removing the front porch and replacing it with a larger sunspace, using water-filled drums and masonry materials to moderate the temperature. Having removed interior walls and the wall between the house and sunspace, sunlight and warmth are now free to penetrate the house, creating a more open airy feeling. Later the side wall of the house was expanded and a clerestory was added to the roof of the house, bringing heat and light into the rear of the house.

Although the house has a gas furnace, it is presently disconnected, and a wood-burning stove provides supplemental heat.

It is estimated that solar heating provides 50-60 percent of the house's heating needs. The house is still under improvement.

Organization	Ken Johnson
Address	329 Home Park Ave. Atlanta, GA 30318
Contact	Ken Johnson
Telephone	(404) 876-0309

Funded By	Private
Cost	$1,200 (sunspace) $3,000 (clerestory)
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Jordan Residence: Passive Solar System

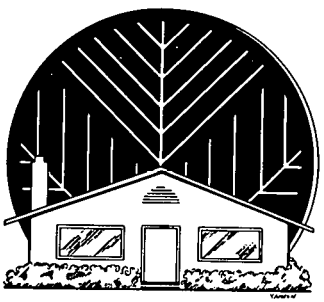
Sunlight entering through this home's large south facing window areas falls on a large concrete wall and floor slab that store solar energy and moderate indoor temperature.

A wood-burning stove provides supplemental heat, while earth berming and tight fitting windows reduce heat loss. Window overhangs and a ventilated air space below the roof help keep the house cool during the summer months.

Typical inside temperatures during winter months range from 62-75 degrees F.

Organization	Kelley Jordan
Address	1314 Iverson St. Atlanta, GA 30307
Contact	Kelley Jordan
Telephone	(404) 525-0988

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	McAninch Residence: Active Solar Heating System

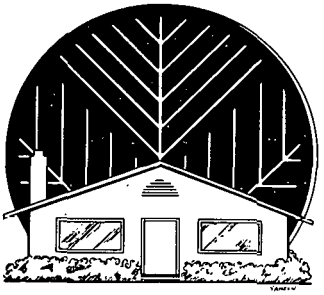
The attic space of the house serves as a large solar collector, the sun passing through the sloped south-facing glazed roof to warm the attic's back interior.

This heat is then ducted into a bin of rock that serves as a heat storage reservoir. Heat from the rock bin is circulated through the house via ductwork as needed.

The system provides 75 percent of the house's heat. Electric strip heaters and heat pumps supply the remaining portion. Domestic hot water is also preheated as it passes through pipes in the attic space.

In the summer the rock bin is used to cool the house by circulating cool night air through the rock bin; during the day the cooled rocks chill the house's interior.

Organization	Glen McAninch
Address	135 Austin Drive Athens, GA 30606
Contact	Glen McAninch
Telephone	(404) 549-3682
Funded By	Private
Cost	$5,000
Congressional District	X
Compilation Date	February 1980



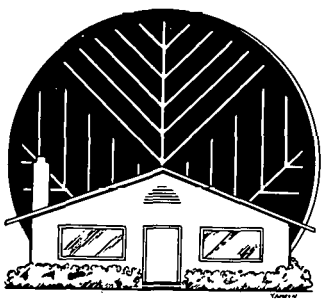
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	McClatchey Residence: Active Solar Hot Water and Heating System
Organization	Jim McClatchey
Address	3363 Ridgewood Rd., Atlanta, GA 30327
Contact	Jim McClatchey
Telephone	(404) 355-1560
Funded By	Private
Cost	$10,000
Congressional District	V
Compilation Date	February 1980

A system of solar collectors is used to heat two different heat storage tanks in the McClatchey home. As solar heat is available, the smaller tank is heated to about 140 degrees F. This tank, via a heat exchanger, provides virtually all of the domestic hot water for the house.

Once the smaller tank has been heated, solar heat is then used to warm a larger heat storage tank. Heat from this tank is extracted via a fan coil arrangement or heat pump to warm the house, providing 78 percent of the house's heating needs.

The heat pump may also be used to heat the large storage tank, thereby providing backup heating. During the summer, the heat pump is used to cool the water of the large storage tank. This stored water is then used to air condition the house.



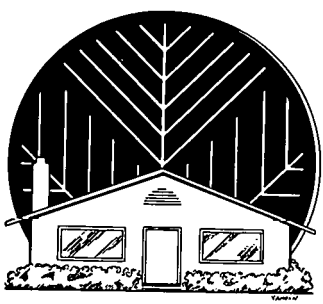
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Michaelson Residence: Passive Greenhouse Space Heating System

A 436 ft^2 greenhouse on the south side of the home provides space heating for the 1500 sq. ft. of living space. Heat is stored in the concrete floor and in filled concrete block walls of the greenhouse. Additional heating is provided by a wood-burning stove.

The greenhouse was completed in January of 1980.

Organization	Mr. Michaelson
Address	Snellville, GA 30278
Contact	Mr. Michaelson
Telephone	n/a
Funded By	Private
Cost	$34,000
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Mills Residence: Passive Solar Space Heating and Preheat System
Organization	Jimmy Mills
Address	3080 River North Parkway. Atlanta, GA 30328
Contact	Jimmy Mills
Telephone	(404) 394-1467
Funded By	Private
Cost	n/a
Congressional District	V
Compilation Date	February 1980

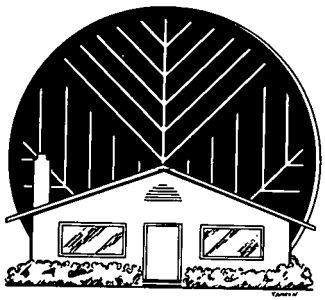
This passive solar house has a massive Trombe wall along its south side that is expected to provide 100 percent of the space heating needs of the building. Air from the house is circulated through the Trombe wall by blower, and distributed through the house by conventional ductwork.

A gas furnace will supply any required supplemental heat.

In the summer, the Trombe wall can be vented to the outside to provide solar-induced ventilation that aids in cooling the house. Domestic hot water preheating is accomplished by circulating water through 2" copper tubes embedded in the concrete Trombe wall. The pipes, holding a total volume of 120 gallons of water, were originally intended to be plastic; but codes did not permit their use.

The house is being built as a demonstration project.

Critique/analysis: In spite of its comparatively high cost (not available), the owner regards the house as a sound investment when considered on the basis of life cycle costing.



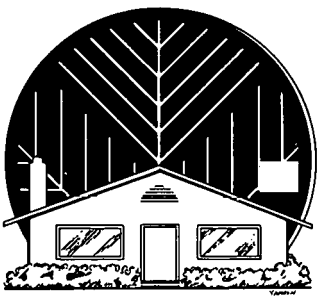
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Moyes Residence: Active Solar Heating and Preheat System

Nine hundred square feet of liquid flat plate collectors supply heat to an underground concrete storage tank (septic tank used for heat storage tank) in the Moye residence. A heat exchanger in the hot water heater provides domestic hot water. Heat for space heating is distributed via a fan coil in the duct system.

Critique/analysis: The owner reports that he gets plenty of hot water, but he has had problems with leaks, and control system malfunction. The concrete storage tank developed hairline cracks. An attempt was made to seal them with plastic resin, but it was unsuccessful and the tank had to be unearthed, fiberglassed, and then reinstalled.

Organization	Dr. Ben Moye
Address	16 South Lake Shore Valdosta, GA 31601
Contact	Dr. Ben Moye
Telephone	(912) 242-3656
Funded By	Private
Cost	$15,000
Congressional District	II
Compilation Date	February 1980

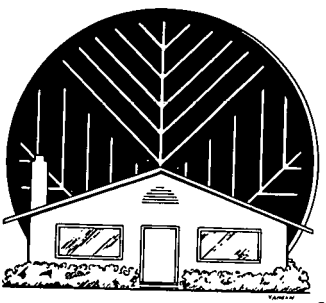


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Multi-Family Residence: Active Solar Preheat System
Organization	Dalton Housing Authority
Address	936 Cascade Rd. Dalton, GA 30720
Contact	Dalton Housing Authority
Telephone	(404) 278-6672
Funded By	HUD Grant
Cost	n/a
Congressional District	IX
Compilation Date	February 1980

A system of active flat plate solar collectors is designed to provide 88 percent of the domestic hot water required in each unit of the complex by preheating water as it enters each apartment's 52-gallon storage tank.

Critique/analysis: There have been some mechanical problems, which are being corrected.

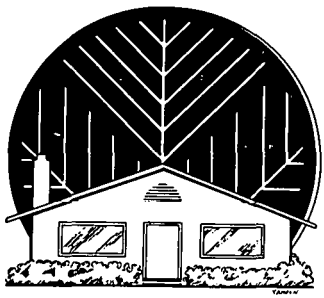


Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Ney Residence: Active Solar Heating System

A national homes catalogue provided the inspiration for this 1232 square feet active solar home. The heating system is composed of a glazed south-facing mass wall of poured concrete containing 8,000 lbs. of taconite (iron ore) used to improve the walls thermal characteristics. Return air of the house's forced air heating system passes across the wall picking up heat before it is recirculated through the house. The system is designed to provide 60 percent of the house's space heating.

Organization	Ney Residence
Address	4 Club Drive Newnan, GA 30263
Contact	Ed Ney
Telephone	(404) 251-3066
Funded By	HUD
Cost	12,000.00
Congressional District	VI
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Ossabaw Island Homes: Hybrid Solar Systems

The Georgia Department of Natural Resources has built three houses for biologists on Ossabaw Island that feature attached solar greenhouses that have water filled drums for heat storage. The greenhouses supply 80 percent of the heating demand. The remainder is supplied by a wood burning stove and electric heat pump. An active system using flat plate solar collectors provides domestic hot water.

Natural ventilation keeps the houses comfortable in the warmer months.

There is a funding request presently being considered that would finance the installation of photovoltaic cells to generate electricity for the island village.

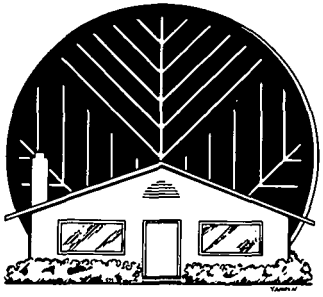
Electricity is presently supplied by a diesel-driven generator. The village consumes an estimated $1,569 Kwtt/month.

The diesel fuel, which is transported by boat from the mainland, costs about $1.67 per gallon (yielding an electric cost of about $ .80/ Kwtt).

High fuel costs and low power consumption make the payback period attractively short for the photovoltaic system (less than 12 years). The system would cost an estimated $318,000.

Organization	State of Georgia
Address	Box 1465 Savannah, GA 31406
Contact	Jerry McCollum
Telephone	n/a

Funded By	
Cost	$318,000 (est. for Photovoltaic System)
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

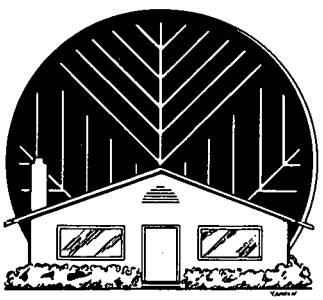
Category	Housing
State	GA
Project Name	Puckett Residence: Passive Solar Home

Heat gained through south-facing windows and an attached greenhouse is used to warm the house. Earth berming on 3 sides and other energy conserving features reduce heating demand.

A wood-burning stove is used as the primary back-up; the house is also fitted with a gas-fired furnace. Recycled materials were used extensively in the house construction to keep down costs. The site is well shaded in the summer, preventing overheating.

Organization	Mike Puckett
Address	Route 2 Canton, GA 30114
Contact	Mike Puckett
Telephone	(404) 345-5750

Funded By	Private (greenhouse)
Cost	$1,500
Congressional District	IX
Compilation Date	February 1980



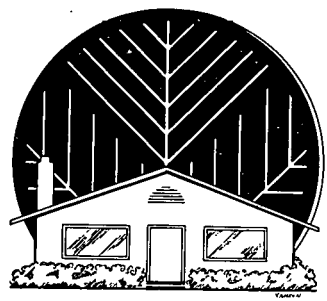
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Riehl Residence: Active Solar Heating System

Mr. Riehl has installed a system consisting of liquid flat plate collectors that warm water in concrete storage tanks. Heat is then extracted from the tanks to heat the house using a water source heat pump. An estimated 65-70 percent of the space heating requirement is met by solar; the remaining heat is supplied either by a wood-burning stove (containing heat exchange coils that can be used to warm the storage tanks), or by electric resistance heaters.

Organization	Mr. Riehl
Address	16485 Freemanville Alpharetta, GA 30201
Contact	Mr. Riehl
Telephone	(404) 475-3436

Funded By	Private
Cost	$4,500 (solar) $ 800 (heat pump)
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

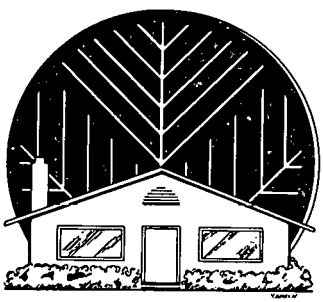
Category	Housing
State	GA
Project Name	Ruhlman Residence : Active Solar Heating and Preheating System

Fixed-mount concentrating solar collectors consisting of tubes positioned between mirrors enclosed in 4' x 8' modules provide 80-85 percent of the house's space heating requirements. A coil in the storage tank provides a means of preheating domestic hot water.

A gas boiler is used to provide supplemental heat. Plans originally called for an absorption type cooling system, but it was not installed.

Organization	Fred Ruhlman
Address	2108 Forest Glade Drive Stone Mountain, GA 30083
Contact	Fred Ruhlman
Telephone	(404) 521-3900

Funded By	Private
Cost	$14,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Schneider Residence: Passive Solar System

The Schneiders' house uses several passive solar techniques to provide 100 percent of their home's heating needs. A large concrete Trombe wall, south-facing windows, and an attached greenhouse all supply heat to the house. The heat is stored in the masonry materials of the house, and in a heat storage bin.

During the warmer months, excess heat is exhausted through vents, and air cooled in underground ducts is drawn back into the house.

Domestic hot water is heated using a "bread box" water heater. A wood-burning stove is used to provide supplemental heat.

Critique/analysis: The lending institution did not require that the Schneiders install a conventional back-up heating system. The only additional costs of the heating system were for the Trombe wall and extra glazing.

Organization	Mr. and Mrs. Ter Schneider
Address	Stockbridge, GA 30281
Contact	Mr. and Mrs. Terry Schneider
Telephone	(404) 922-8949

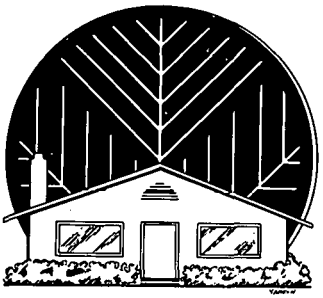
Funded By	Private, Land Bank Loan
Cost	$53,000 + land
Congressional District	VI
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Shadow Lake Apts.: Active Solar Space Heating and Preheat System
Organization	Shadow Lake Apts.
Address	McLoud Bridge Rd. Swainsboro, GA 30401
Contact	n/a
Telephone	n/a
Funded By	HUD Grant
Cost	$30,000
Congressional District	I
Compilation Date	February 1980

Three townhouses obtain 75 percent of their space heating and 90 percent of their domestic hot water from liquid flat plate collectors coupled to a water storage tank.

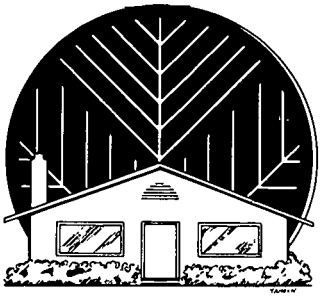
Backup heat is provided by an electric heat pump. The pump can be used for heating directly via fan coil in the duct work, or on off-peak hours to heat the solar storage tank. No off-peak rate structure is available at present, which would make the second mode more attractive.



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Shedd Residence: Active Solar Space Heating and Hot Water System
Organization	Don & Edith Shedd
Address	Route 2, Box 61A1 Monroe, GA 30655
Contact	Don & Edith Shedd
Telephone	(404) 267-3534
Funded By	Private
Cost	n/a
Congressional District	X
Compilation Date	February 1980

Seventy-five percent of the house's space heating requirements are met by heat collected from low cost, site built air-type flat plate collectors. Eighty percent of the domestic hot water is supplied via thermosiphon collectors. Other features include a solar heated hot tub, a solar ventilation system, a composting toilet, a cistern for collecting rain water, and a wood-burning stove back-up.



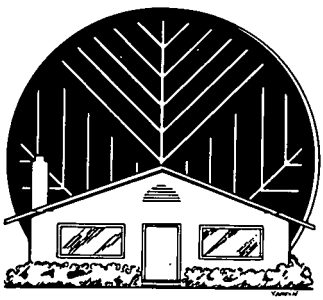
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Shenandoah Development

In 1968, Atlanta developer Scott Hudgens decided to build a complete new town, large enough to be self-sustaining and to provide its own job base, housing, shopping, and residential ammenities. He wanted to build a community with jobs and homes close together to save time and energy, with plenty of space for parks and playgrounds. The new town, called Shenandoah, is located 35 miles southwest of Atlanta on gently rolling pastureland and pine forests. Approximately 42,000 people will occupy the community's 740 acres. Twenty percent of the land will remain open space.

So far, over $18 million has been committed to developing alternative energy sources and energy conservation in virtually every phase of development: in homes, industry, and recreation.

Organization	Shenandoah Development Corporation
Address	P.O. Box 1157 Shenandoah, GA 30265
Contact	Ray Moore
Telephone	(404) 577-4820
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

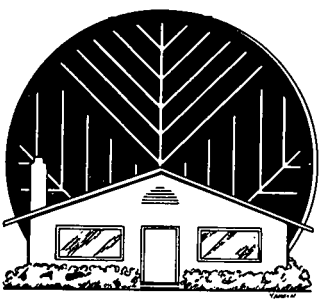


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Shenandoah Development: Solar and Energy Conserving Residences

Solar houses and energy conserving houses in Shenandoah include a house with a solar-assisted heat pump for space heating and hot water; two homes with solar water heating; and one passive solar-heated and-cooled house being constructed in 1979. Many houses have "Arkansas" construction and various energy conserving features.

Organization	Shenandoah Development Corporation
Address	P.O. Box 1157 Shenandoah, GA 30265
Contact	Ray Moore, Sr.
Telephone	(404) 253-8445
Funded By	ERDA ($778,000)
Cost	$2.4 million (total project)
Congressional District	VI
Compilation Date	February 1980



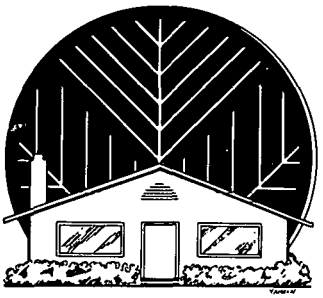
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Simpson Residence: Active Solar Hot Water System

A system of flat plate collectors heats water in two 54-gallon tanks. One electric resistance heating element in the second tank provides supplemental heating as necessary. Simpson, who was in the industrial contracting business, supervised the installation himself, keeping costs down to about $900.

This system, which provides 85-90 percent of the domestic hot water has already paid for itself in energy savings.

Organization	Doug Simpson
Address	1404 Beverly Dr. Dalton, GA 30720
Contact	Doug Simpson
Telephone	(404) 278-8474
Funded By	Private
Cost	$900
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

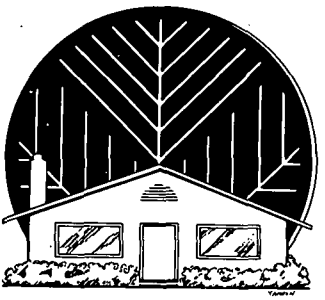
Category	Housing
State	GA
Project Name	Sizemore Residence: Active Solar Preheat System

Sizemore's domestic hot water preheat system consists of liquid flat plate collectors connected to an 80-gallon tank that supplies hot water to an electric hot water heater. The system, which is under constant improvement, supplies 65 percent of the home's hot water in winter, and 95 percent of its summer needs.

The system was retrofitted to the house in 1976.

Organization	Mike Sizemore
Address	860 Peachtree Battle Circle N.E. Atlanta, GA 30327
Contact	Mike Sizemore
Telephone	(404) 351-5236

Funded By	Private
Cost	$1,500
Congressional District	V
Compilation Date	February 1980



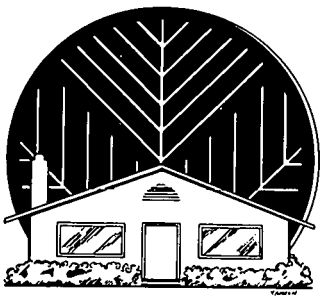
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Summerfield Development

Summerfield is a 77 lot suburban development near downtown Alpharetta, Georgia. Roughly one-third of the homes will be heated and cooled with active solar systems. The houses range in size from 1,600 to 3,000 square feet. Although priced slightly higher than conventional houses, the $2,200 federal income tax credit for energy efficient design makes the price competitive with conventional houses.

Buyer contracts for the solar homes include a provision by which the company agrees to repurchase the homes after a year if the owners aren't satisfied with the performance of the solar systems.

Organization	Cates Development and Construction Co.
Address	110 East Andrews Dr. Atlanta, GA 30305
Contact	Gene Cates or Jerry Cates
Telephone	(404) 237-9209
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Tate Dome House

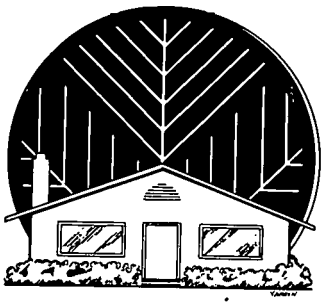
This 2,000 ft^2 house consists of a 39' diameter dome. Because of the house's unique shape and tight, well-insulated construction, the heat loss is limited to 23,000 Btu/hr.

A 100 sq. ft. south-facing skylight lets in sunlight for heating.

Additional heat is supplied by a gas furnace.

Heating bills are typically less than $75.00 for the entire heating season.

Organization	Tate Dome House
Address	1275 South Deshon Rd. Atlanta, GA
Contact	The Tates
Telephone	(404) 482-6074
Funded By	Private
Cost	$36,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

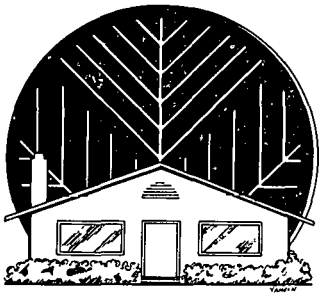
Category	Housing
State	GA
Project Name	Tatum Residence: Passive Solar Space Heating

This two-story underground house is open to the south with large expanses of glass that provide direct gain passive solar heating. Masonry materials of the house store heat, moderating inside temperatures.

Solar will provide at least 90 percent of the homes space heating. A wood stove and fireplace provide supplemental heat.

Overhangs and plantings will shade the house in the summer to keep it cool. An exhaust fan and large openings provide ventilation. Mr. Tatum is a contractor and is supervising the construction, which will be completed in May of 1980.

Organization	Charles Tatum
Address	3109 Glad Dale Dr. Conyers, GA 30208
Contact	Charles Tatum
Telephone	(404) 922-3064
Funded By	Private
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

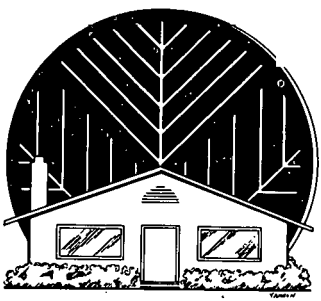


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Terrell Residence: Active Solar Preheat System

An activc liquid flat plate collector system retrofitted to the Terrell residence supplies 65 percent of the home's domestic hot water demand by preheating water for an electric hot water heater.

Organization	Lynn Terrell
Address	Route 4 Loganville, GA 30249
Contact	Lynn Terrell
Telephone	(404) 466-8659
Funded By	Private
Cost	$1,250 (materials) $ 700 (installation)
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	USN Solar Housing

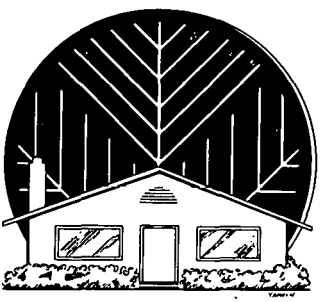
Two-hundred-fifty housing units, including single and multifamily residences for the senior Navy officiers, will receive 35-40 percent of their space heating and 45 percent of their domestic hot water from the sun.

The solar system is composed of 20,000 sq. ft. of liquid flat plate collectors divided into five systems designed to heat water for storage in underground tanks. In addition, a 280,000-gallon tank will provide seasonal heat storage, absorbing excess solar heat and waste heat from other processes.

Water source heat pumps will be used to extract heat from the storage tanks for use in the buildings. A boiler burning No. 2 fuel oil will provide supplemental heat.

Another system designed to provide domestic hot water to the commissary at the base is in the design stages.

Organization	United States Navy (USN)
Address	Navy Submarine Base Kings Bay, GA
Contact	Construction Administration Office
Telephone	(912) 673-2123
Funded By	Department of Defense
Cost	$2,390,000
Congressional District	I
Compilation Date	February 1980

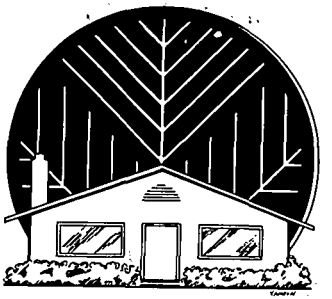


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Wade Residence: Active Solar Hot Water System

Several liquid flat plate collectors are used to heat water in the Wade's home. The water, which is stored in a 120-gallon tank, furnishes 100 percent of the family's domestic hot water needs in the summer, and 80 percent in the winter. Supplemental heating is supplied by a gas hot water heater.

Organization	Larry Wade
Address	Cliftondale, GA
Contact	Larry Wade
Telephone	n/a
Funded By	Private
Cost	$5,000.00
Congressional District	VI
Compilation Date	February 1980

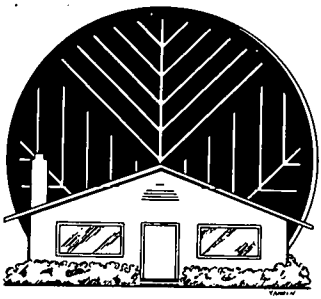


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Wetzel Residence: Active Solar Space Heating and Hot Water System
Organization	Frank Wetzel
Address	140 Kingwood Dr. Fayetteville, GA 30214
Contact	Frank Wetzel
Telephone	(404) 461-6618
Funded By	Private
Cost	$6,500.00
Congressional District	VI
Compilation Date	February 1980

A system of liquid flat plate collectors, coupled with a water storage tank, provide Frank Wetzel's home with its space heating and domestic hot water needs. The water is heated via a heat exchanger in the storage tank. The storage system can hold enough heat to carry the house's heating demand for a two-day period. A gas furnace provides back-up heating.

Critique/analysis: There have been no problems to date. No performance figures are available.

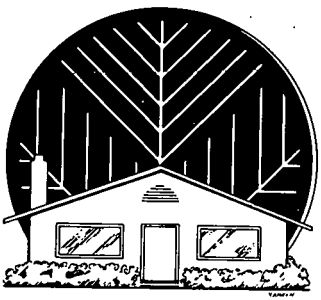


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	GA
Project Name	Yawn Residence: Active Solar Preheat System

The Yawn residence, built in 1977, uses flat plate collectors to preheat domestic hot water before it enters the conventional electric hot water heater.

Organization	Des Yawn
Address	2655 Indian Lake Rd. Marietta, GA 30062
Contact	Des Yawn
Telephone	(404) 971-9426
Funded By	Private
Cost	$1,750.00
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

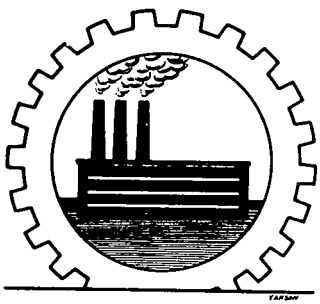
Category	Industrial
State	GA
Project Name	Georgia Gasohol Association

Thirty-five gasohol supporters from around Georgia met in Griffin in early October of 1979, to form the Georgia Gasohol Association. Oil distributors, farmers, and private individuals from all over the state came to the first public meeting of the corporation.

One of the first goals of the association will be to work toward the elimination of the state's 7 1/2 cent-per-gallon tax on gasohol. The repeal of this tax will make gasohol competitive with unleaded gas and will benefit the market that gasohol provides for American farm products. Gasohol is currently being sold in Griffin, Atlanta, Valdosta, Statesboro, Savannah and Bainbridge.

Wallace Pryor, an independent oil distributor was elected the organization's first president. Pryor's group is building a 1,000-1,500 gallon per day experimental still in Barnesville, Georgia. When the still becomes operational (target date: 25 November 1979) he plans to experiment with producing alcohol from corn, rye, sawdust, newsprint, and potato wastes. The boiler will be fired with wood chips. Pryor has plans to eventually build a 20,000 gallon per day still.

Organization	Georgia Gasohol Association
Address	P.O. Box 903 Griffin, GA 30224
Contact	Wallace Pryor
Telephone	(404) 228-4548
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



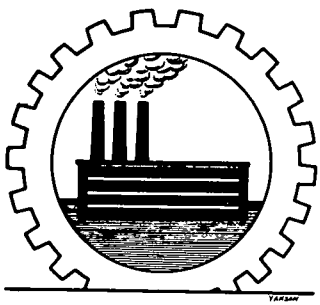
Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	GA
Project Name	West Point-Pepperell Solar Tracking Collector System

This system consists of 7500 sq. ft. of tracking collectors, divided into 24 rows, each with a shadow-bar tracking device. The system produces pressurized steam used for an industrial drying process.

Information on the project's performance will be available after the monitoring period. There have been mechanical problems with the tracking system.

Organization	West Point-Pepperell
Address	Post Office Box 232 West Point, GA 31833
Contact	Carl Summers
Telephone	(404) 756-7111 ext. 2492
Funded By	DOE
Cost	$600,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	George A. Towns Elementary School

Organization	George A. Towns Elementary School
Address	760 Bolton Rd. Atlanta, GA 30331
Contact	George A. Towns Elementary School
Telephone	(404) 691-6707

Funded By	NSF
Cost	$912,000
Congressional District	V
Compilation Date	February 1980

The National Science Foundation sponsored Westinghouse Special Systems for the design and provision of a solar heating and cooling system for the George A. Towns Elementary School in Atlanta. The system performance is being monitored and analyzed by the Georgia Institute of Technology.

The 32,000 ft^2 building uses 576 (10,400 sq. ft.) flat plate collectors mounted at a 45-degree angle on the roof, and facing south. The collectors are augmented by aluminum reflectors (12,000 sq. ft. total) facing the collectors and mounted at a 36 degree angle to increase summertime efficiency.

The collectors include two rectangular pieces of tempered glass that cover an absorber plate, interlaced with copper-covered pipes.

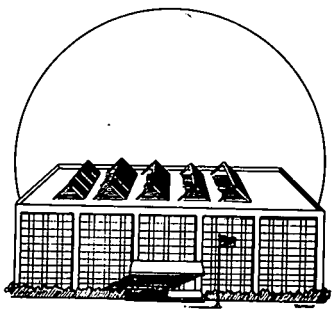
Water circulates through the collector and through heater pipes into hot water storage tanks. Average water temperatures achieved by the system are 140 degrees F in mid-winter, and 200 degrees in mid-summer.

The school has three 15,000-gallon underground steel storage tanks, two for hot water and one for chilled water. The hot water is used to drive a 100-ton absorption chiller that can provide 100 percent of the school's cooling needs (solar energy can provide 60 percent of the energy requirements of the chiller.)

arge volume of chilled water storage
es the system to be operated during a cloudy period.

The system also provides for 50 percent of the school's space heat, and 80 percent of its hot water needs.

School construction was completed in September of 1975.



Renewable Resources—A National Catalog of Model Projects

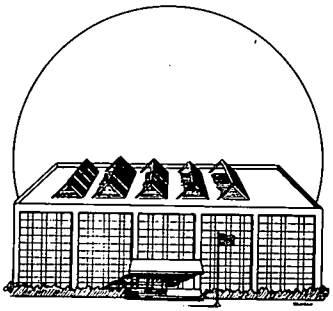
Category	Institutional
State	GA
Project Name	Georgia Warm Springs Hospital

This system utilizes 88 degree thermal spring water to provide space heating and pre-heating for domestic hot water used in the center. An electric resistance water heater provides supplemental heating. The water is also used to preheat feed water to a coal-fired process steam boiler.

The hospital had applied for, but did not receive, a grant from HEW for the installation of some solar equipment. It now appears that the state is going to close the hospital rather than spend additional money on renovation.

Organization	Georgia Warm Springs Hospital
Address	Roosevelt Warm Springs Rehab. Ctr. Warm Springs, GA 31830
Contact	Richard Smith
Telephone	(404) 655-3321 ext. 238

Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	Northwest Georgia Regional Hospital

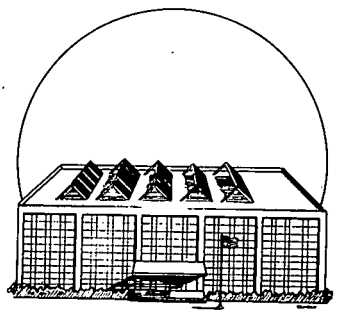
The boiler at the Northwest Georgia Regional Hospital was retrofitted with a wood-fueled gasifier. The gasifier, which burns wood chips and residues in a vessel with a restricted air supply, has a heating value of 120 to 160 Btus per cubic foot. It is going to produce steam for space-heating and process heat.

At peak operation, the gasifier is expected to use four tons of wood chips an hour at a cost of approximately $60.00. In comparison, the existing 550 horsepower boiler uses 164 gallons of oil for the same time period. A substantial savings is therefore expected.

The boiler was expected to be test-fired in late 1979.

The Georgia Forestry Commission, which along with the Appalachian Region Commission funded the hospital project, is also having the natural gas boiler at the newly completed penal institution in Chester converted to a wood system. The system, which should be completed in 1981, is expected to meet the institution's heat and steam requirements. A back-up system will be used, though, lest the wood system fail or prove inadequate.

Organization	Northwest Georgia Regional Hospital
Address	Redmond Road Rome, GA 30161
Contact	John Mixon
Telephone	(404) 295-6011
Funded By	Georgia Forestry Commission, Appalachian Region Commission
Cost	$292,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

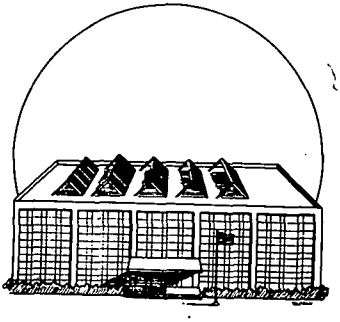
Category	Institutional
State	GA
Project Name	Oatland Island Education Center

A system of flat plate collectors connected to a 200 gallon storage tank provides space heating, domestic hot water and hot water for two outdoor showers for a dock house that was converted into a laboratory. The system provides 100 percent of the lab's heating requirements, as no back up system is installed.

Materials valued at $3,300 were purchased through a Title 4B grant under the National Elementary and Secondary School Program.

Labor was provided through the Young Adult Conservation Corps.

Organization	Oatland Island Education Center
Address	711 Sandtown Road Savannah, GA 31410
Contact	Tony Cope
Telephone	(912) 897-3773
Funded By	Title 4B National Elementary and Secondary School grant
Cost	$3,300 (Materials)
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	Ocmulgee National Monument

The Ocmulgee National Monument has a solar-heated and-cooled visitors center. Flat plate collectors provide heat necessary to drive a Rankine cycle turbine, which in turn can be used to drive an electric generator (12 KW output), or a 25-ton chiller for air conditioning.

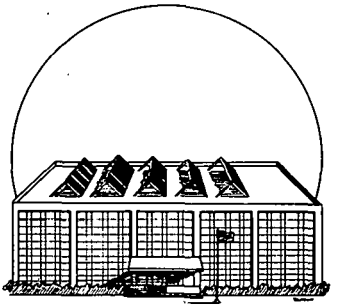
It is estimated that the system will provide 75 percent of the museum's space heating via fan coil in a forced air heating system.

Back-up heating is provided by a gas-fired boiler. The project is basically complete; however some systems are still undergoing tests.

The facility opened in March of 1979.

Organization	Ocmulgee National Monument
Address	1207 Emergy Hwy. Macon, GA 31201
Contact	Bob Operguard
Telephone	(912) 743-1124

Funded By	Park Service $325,000 DOE $125,000
Cost	$450,000
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

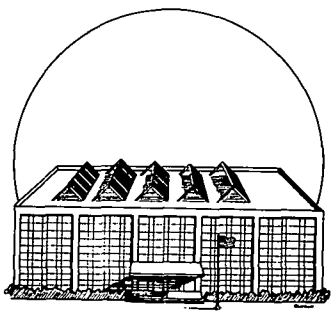
Category	Institutional
State	GA
Project Name	Ralph Bunche Middle School
Organization	Ralph Bunche Middle School
Address	Atlanta City Schools Nisky Lake Road Atlanta, GA 30331
Contact	Ralph Bunche Middle School
Telephone	(404) 349-3937
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

Ralph Bunche Middle School uses the sun for its heating, cooling, and domestic hot water needs. Its solar system consists of 5,300 square feet of evacuated tube collectors with reflector augmentation.

Bunche School is not only the first school in the Atlanta School System designed and constructed for solar, but also the first major new solar building in operation in Atlanta. Solar power is expected to provide 55 to 60 percent of the school's space heating and domestic hot water, and approximately 22 percent of the building's air conditioning. Consequently, Bunche will use only 25 percent of the fossil fuel required by a conventional building for heating and hot water.

Beginning with this school, the Atlanta Board of Education also significantly tightened its requirements on energy saving design. The school features foam-insulated exterior walls, increased roof deck insulation, double glazing in all windows and an overall design which minimizes the use of windows.

As one of the nation's first schools specifically designed for solar, Bunche School is planned to be a demonstration project for emerging solar energy methods. The Board of Education expects to closely monitor the performance of the equipment. The Board will also watch developments in the growing solar energy industry so that significant advances in technology can be utilized in future School Board projects.



Renewable Resources—A National Catalog of Model Projects

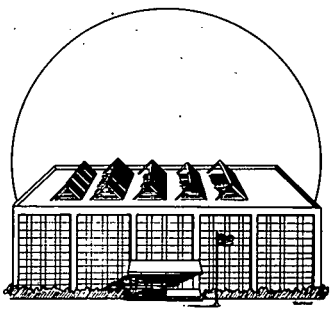
Category	Institutional
State	GA
Project Name	Royal Elaine Nursing Home

A home-built solar system consisting of copper absorber panels housed in glazed wooden enclosures provides domestic hot water preheat for a 116-unit nursing home. The system preheats water from 55° degrees F, which is then fed into an electric boiler that boosts the temperature to 140° degrees F.

Even on cloudy days water leaves the collectors at 85° degrees F. The home uses 250,000 gallons of water per month.

The system was installed in 1971-2, and expanded in 1976.

Organization	Royal Elaine Nursing Home
Address	2110 Hogansville Rd. LaGrange, GA 30240
Contact	Roy Neely
Telephone	(404) 882-0121
Funded By	Private
Cost	$7,800
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	Savannah Science Museum

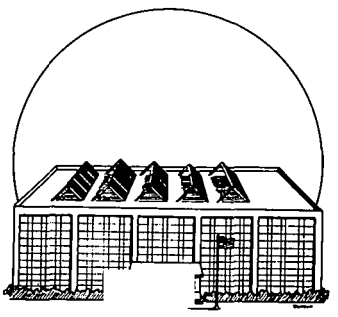
Two hundred-twenty five high temperature flat plate collectors will be used to provide space heating and domestic hot water and to power an absorption chiller for air conditioning for a 24,000 ft^2 museum. A 5000-gallon tank provides hot water storage, while a separate 11,000-gallon tank stores cool water used in air conditioning.

Electric resistance heaters currently supply space heating; air conditioning is provided by conventional electric air conditioners.

The system is being installed as a demonstration project under a grant from DOE for $200,000. An additional $115,000 was raised locally and $27,000 is being sought from the county to provide the final amount needed to complete construction.

Actual construction and installation of the system has not begun. But some components, including the absorption chiller and flat plate collectors, have been purchased. When complete, the system will provide 70 percent of the energy demanded by the museum, or about $8,000 - $10,000 savings per year on utility bills.

Organization	Savannah Science Museum
Address	4405 Paulsen St. Savannah, GA 31405
Contact	Bill Travers
Telephone	(912) 355-6705
Funded By	DOE $200,000
Cost	$342,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

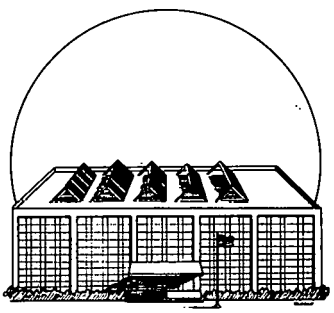
Category	Institutional
State	GA
Project Name	Solar Daycare Center

Mike Smith designed and built an active solar hot water heating system to augment an existing gas-fired system for the Airline Day-care Center. The system consists of six panels through which an ethyl-glycol antifreeze mixture is circulated by an electric pump.

The heat is then transferred via a heat exchanger to a 130-gallon storage tank. The collectors are constructed from galvanized metal with a corregated copper absorber plate and 1/2-inch copper tubing.

The project was funded by a $1,500 grant from the Department of Labor. Performance monitoring is being conducted. To date no problems have been encountered and the system requires very little maintenance.

Organization	Allied Community Service
Address	Box 450, Federal Bldg. 126 Washington Street Gainesville, GA 30503
Contact	Mike Smith
Telephone	(404)532-0118
Funded By	DOL
Cost	$1,500
Congressional District	IX
Compilation Date	February 1980



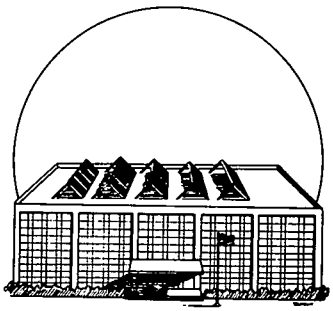
Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	Tourist Information Center

This information center is one of several installations to be built along Georgia's interstate Highways using solar energy. Liquid flat plate collectors will provide hot water for the rest room facilities.

The facility is now under construction.

Organization	Tourist Information Center
Address	Interstate I-75 Catoosa City, GA
Contact	John Fripp
Telephone	(404) 656-5325
Funded By	Georgia DOT
Cost	$1200
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

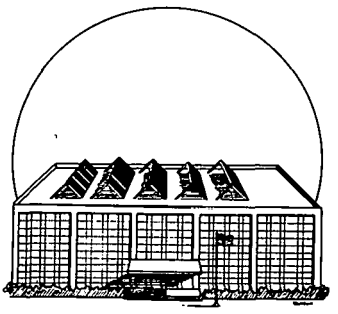
Category	Institutional
State	GA
Project Name	Union County High School

A small wood-burning unit is being installed to heat a portion of the Union City High School in Blairsville.

The unit, which is expected to be operating by May 1st, 1980, is primarily a demonstration model. It is expected, however, to produce savings ranging from 40 to 60 percent over present energy use.

The Georgia Forestry Commission, which jointly sponsored the Union County project with the Tennessee Valley Authority (T.V.A.) and the county school system, is also having wood-burning systems installed in high schools in Cornsville and Soperton.

Organization	Union County High School
Address	Blairsville, GA 30512
Contact	John Mixon
Telephone	(912) 744-3353 (GA Forestry Commission)
Funded By	Georgia Forestry Commission, T.V.A., Union County School System
Cost	$25,000-$30,000 (est.)
Congressional District	IX
Compilation Date	February 1980



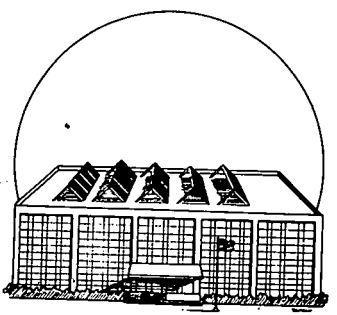
Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	United States Air Force Airplane Wash

Sixteen hundred square feet of flat plate solar collectors mounted beside a parking area heat 130,000-gallons of water to a service temperature of 180 degrees F. The hot water is used once a week to wash aircraft. The system is designed to provide 100 percent of the hot water used in this process.

Organization	Corrosion Control Facility
Address	Robins Air Force Base Warner Robbins, GA 31093
Contact	Paul Kelly
Telephone	(912) 926-5472

Funded By	Dept. of Defense
Cost	$974,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	University Lutheran Chapel

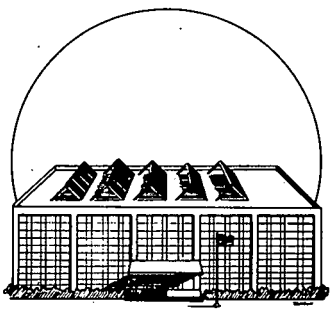
A pit greenhouse has been retrofitted to the Chapel's existing recreation building. Heat is stored in the walls, floors and water filled drums.

The greenhouse provides 47 percent of the recreation building's heat (70 degrees F inside temp.)

Supplemental heating is provided by a wood-burning stove.

The greenhouse was built by volunteer labor that had little prior construction experience.

Organization	University Lutheran Chapel
Address	1010 S. Lumpkin St. Athens, GA 30601
Contact	Ed Ralph
Telephone	(404) 543-3801
Funded By	n/a
Cost	n/a
Congressional District	X
Compilation Date	February 1980



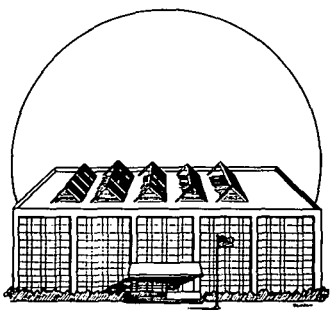
Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	GA
Project Name	Veterans Administration Hospital (V.A.)

Eight thousand liquid plate collectors preheat potable water to temperatures of up to 140 degrees F. The water then enters a boiler for further boosting to service temperature.

The system is designed to preheat 13,000 gallons of water per day.

Organization	V.A. Hospital
Address	1400 Comfort Rd. Augusta, GA 30909
Contact	n/a
Telephone	(404) 733-4471
Funded By	DOE, V.A.
Cost	$575,000
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	GA
Project Name	Proposed Legislation

Only two bills left over from the 1979 Session directly deal with solar.

One of these bills, HB 537 provides an income tax credit for solar utilization. The credit is "not to exceed one thousand dollars in an amount equal to 25 percent of the cost of active or passive solar energy systems and installation of such systems." The Office of Energy Resources was authorized to establish rules and regulations for determining which systems qualify, and in doing this, is directed to meet with and consider the views of solar energy system manufacturers, retailers, installers, architects, engineers, homebuilders and developers, lenders, trade associations and industry groups, public interest organizations, and members of the general public.

The second bill, HB 282, would largely duplicate the existing property tax exemption for solar systems. Although HB 282 would cover wind, photovoltaic, and geothermal systems, the proposed procedure for obtaining the exemption could be so cumbersome as to be prohibitive. The bill also contains some tax credit for energy conservation measures.

Organization	Georgia Office of Energy Resources
Address	270 Washington St., Room 615 Atlanta, GA 30334
Contact	Robin Meyer
Telephone	(404) 656-5176

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	GA
Project Name	Solar Legislation

Organization	Georgia Office of Energy Resources
Address	270 Washington St. Room 615 Atlanta, GA 30334
Contact	Wayne Robertson
Telephone	(404) 656-5176

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

There are three major state laws, in addition to the Federal National Energy Act, which affect solar use in Georgia: The Solar Easement Act of 1978, the Sales and Use Tax Act Amendment, and the Property Tax Exemption Authorization of 1976.

SB 506, the Solar Easement Act, clarifies the rights of a property owner to negotiate an airspace easement with neighboring property owners to prevent construction or vegetation from shading a solar energy system.

Act No. 1030, the Sales Tax Measure of 1976, allows the owner of the property to which a solar system is attached to file for a refund of the system from the State Department of Revenue. This refund extends to July 1, 1986. This act excludes walls, roofs or equipment that would ordinarily be contained in the structure, thus limiting severely its applicability to passive solar systems. It also does not apply to residential solar electric power generation systems (windmills, photovoltaics). Sales tax on the system is not reimburseable.

The property tax exemption (RES. No. 167) is enabling legislation for a constitutional amendment authorizing any county or municipality to exempt the value of a solar system from ad valorem property taxation. All counties must pass this amendment before July 1, 1986.

Indirectly related to solar is the statewide thermal efficiency standards bill for new and renovated buildings, passed in 1977. A cogeneration bill was passed in 1978, while a bill requiring that life-cycle cost analyses and energy conservation practices be used in any state-owned or financed facilities failed to be enacted.

Critique/analysis: SB 506 was a start in guaranteeing sun rights, but it is not strong enough. Further action should be taken by the state to require new developments to in-
le provision for sun rights with restric-
covenants, height restrictions and planning. Amendments to zoning laws should require the addition of a Solar Energy Impact Statement to any comprehensive plan accompanying application for building permit.

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	GA
Project Name	Economic Opportunity Agency

The EOA is designed to help low income families lower energy bills. They have a weatherization program, teach meter reading, and conduct energy audits. They are working with Savannah Science Museum and LWV on community workshops on $50 solar water heaters.

Organization	Economic Opportunity Agency
Address	Box 1353 Savannah, GA 31402
Contact	Pal Sadler
Telephone	(912) 232-2165
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	GA
Project Name	Solar Greenhouse Workshop

A solar greenhouse "hands-on" workshop was conducted in Plains, Georgia from December 14-19 of 1978. The project was funded by the United States Department of Agriculture and involved several public agencies, community organizations, energy consultants and local residents. The purpose of the workshop was to demonstrate that solar greenhouses are a simple, elegant way for rural people to solve part of their energy problem.

The 8' x 12' greenhouse is attached to the south-facing side of a house. The front face is fabricated in two 12' sections in order to involve a maximum number of people in construction activities.

Heat is stored in eight 55-gallon drums and two 20-gallon drums, filled with water and painted black. These drums heat up during the days and release their heat slowly by radiation at night. The main entry to the greenhouse is on the east side through a storm/screen door which provides winter light and summer ventilation.

The top half in four of six bays can be opened to assist ventilation. The greenhouse becomes, in effect, a screened-in porch with thermal mass to moderate temperatures during the summer.

ıny homes in the rural South are built up c ıcks to assist with ventilation and humidity c...ol. This poses a problem in sealing a solar greenhouse, which was addressed by fabricating an insulated lashing plate made of trailer aluminum and 2 inches of styrofoam. The flashing was nailed into the siding of the house and bermed at the bottom to create a seal.

The greenhouse provides a high percentage of heat to the two adjacent rooms during daylight hours. It was not possible to quantify actual fuel savings. It is estimated that the

Organization	Claude Terry & Associates
Address	1955 Cliff Valley Way, N.E. Atlanta, GA 30329
Contact	Randy Schwartz
Telephone	(404) 329-0430

Funded By	USDA
Cost	$1,000 (Greenhouse)
Congressional District	VI
Compilation Date	February 1980

greenhouse could provide the equivalent of 1.2 gallons of No. 2 fuel oil per day. This figure represents an average projected savings based upon storage capacity, of 168,000 BTU/day (BTU content of fuel oil is 140,000/gallon). Payback, strictly in terms of energy (at a static price) on the approximately $1,000 materials investment in the solar greenhouse will be approximately 14 years. However, this does not take into account food payback and qualitative aspects of the greenhouse.

In interviews the occupant expressed a real enjoyment of the greenhouse, making her later years more tolerable. Her grandchildren had the opportunity to help in the garden and were provided with play-space and an opportunity to learn. This opportunity was extended to the whole community as they became involved with the project. Students from a nearby school came to the greenhouse to learn about solar energy.

Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	The Georgia Solar Coalition, Inc.

For over twenty months now the Georgia Solar Coalition (GSC) has fostered the development of solar and other renewable energies in Georgia. By weaving together a broad-based coalition of concerned citizens, small business owners, labor, minorities, low income citizens, environmentalists and students, the Coalition serves as a public forum for Georgians to voice their support of a sound energy policy based on solar energy.

GSC also works closely with the Center for Renewable Resources in Washington, D.C. and with other state and regional groups across the country.

GSC a non-profit, tax-exempt corporation, has a small staff, and therefore relies heavily on volunteers.

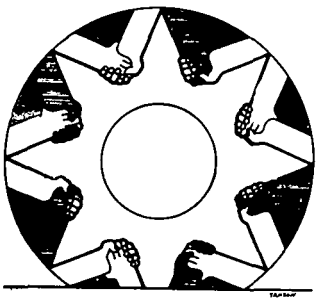
The Coalition conducts a statewide educational program on solar energy. It has a speaker's bureau, slide show and film library on solar energy and serves as a clearinghouse for literature on renewable energy. Each year it organizes Georgia SUN DAY, a statewide set of educational activities on renewable energy.

An important part of the Coalition's work is sponsoring solar "Barnraisings", "hands on" workshops on low-cost solar applications such as solar greenhouses, and solar water heaters.

The Coalition frequently serves as consultant to other organizations and agencies on energy issues. Some GSC projects include organizing testimony for DOE Region IV Solar Domestic Policy Review hearings, and publicity and outreach for Region IV Appropriate Technology Small Grants Program. It has authored several energy papers, including Barriers to Solar Energy in Georgia and the Georgia contributions to Southern Profiles: Appropriate Technology in the Southeast, and the CRR's Model Solar Programs project.

Organization	The Georgia Solar Coalition, Inc.
Address	3110 Maple Drive, NE Suite 403-A Atlanta, GA 30305
Contact	Betty M. Terry
Telephone	(404) 231-9994

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 19780



In March of 1980, the Coalition will cosponsor the Neighborhood Energy Fair with the City of Atlanta and the Georgia Office of Energy Resources. The fair will address all aspects of energy conservation and renewable energy. Following the fair, there will be a series of programs in Atlanta area neighborhoods on local energy policies and the potential for solar energy in Atlanta. "How-to" seminars will be held to teach residents specific ways they can utilize conservation and solar energy.

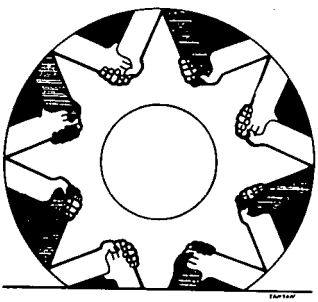
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	Georgia Solar Energy Association

Georgia Solar Energy Association is an organization of solar scholars, designers, installers, and consumers. It is affiliated with the American Section of the International Solar Energy Society. Their newsletter "Sun-Spots" is edited by Robert Ames. GSFA holds regular meetings, preceded by dinner at a local restaurant, on the last Thursday of each month. The public is invited.

Organization	Georgia Solar Energy Association
Address	College of Engineering Georgia Institute of Technology Atlanta, GA 30332
Contact	Dr. J. Richard Williams
Telephone	(404) 894-3351 or (404) 449-4900

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	Jubilee Partners

Jubilee Partners is a direct outgrowth of Koinonia Partners.

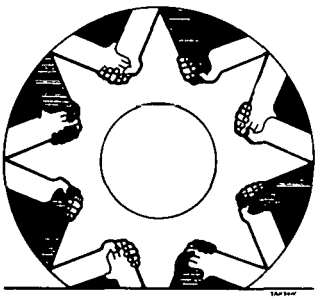
Several of the members of Jubilee were involved in the development of low-cost solar technologies at Koinonia. Jubilee plans on the construction of low-cost solar technologies to be a major source of income for their new community.

By keeping their labor costs to an absolute minimum, they plan to make construction of solar systems a means of service as well as income. This would enable low income families to buy solar equipment and cut hundreds of dollars off their annual energy bills.

Jubilee also plans to work in the weatherization of houses and the construction of new solar heated-houses for low-income families.

Organization	Jubilee Partners
Address	Box 459 Comer, GA 30629
Contact	Don Mosley
Telephone	(404) 783-5244

Funded By	n/a
Cost	n/a
Congressional District	X
Compilation Date	February 1980

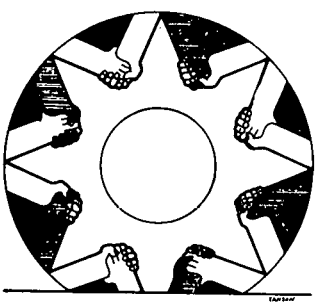


Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	Passive Solar Energy Society

The Passive Solar Energy Society, an organization of solar scholars, enthusiasts, and practitioners, hopes to encourage the widespread use of low-cost, passive solar systems through public education, field trips, speakers, etc. The Society has a regular meeting date on the third Sunday of each month. They alternate field trips to view passive solar constructions with formal presentations.

Organization	Passive Solar Energy Society
Address	College of Architecture Georgia Institute of Technology Atlanta, GA 30332
Contact	George H. Ramsey
Telephone	(404) 894-3845
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



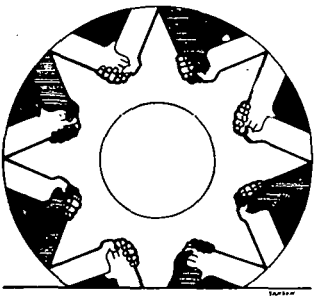
Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	Solar Energy Industries Association of GA

A Georgia chapter of the Solar Energy Industries Association (SEIA) is being organized in Georgia. SEIA, a national trade organization, was founded for the purposes of promoting the widespread understanding and application of solar technologies, and coordinating activities between all segments of the solar community. The Georgia chapter will bring these purposes closer to home in the Georgia solar community and promote the growth of the solar industry in the state.

Organization	Solar Energy Industries Association of GA
Address	c/o Grumman Corp. 1420 First National Bank Tower Atlanta, GA 30303
Contact	William T. Schwendler
Telephone	(404) 588-1351

Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

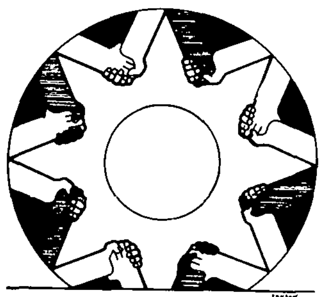
Category	Outreach
State	GA
Project Name	Southern Solar Energy Center
Organization	Southern Solar Energy Center
Address	61 Perimeter Park Atlanta, GA 30341
Contact	William E. Stoney, Deputy Director
Telephone	(404) 458-8765
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

The Southern Solar Energy Center (SSEC) has been established at the direction of the Department of Energy to promote the commercialization of solar and other renewable energy sources. The Center is one of four regional centers, and serves an area including 19 states and territories including Georgia.

The SSEC is now initiating various commercialization activities in the technology areas of solar hot water, passive design, industrial process heat, wood combustion, and small wind energy systems. These activities are being directed to the residential, commercial and industrial market sectors. To maximize the resources and energies available for this regional effort, the Center seeks to develop cooperative working relationships with active solar organizations in each of the 19 jurisdictions. Such relationships will focus on information sharing and dissemination.

Among SSEC's activities in Georgia include modification of a multi-family apartment complex. Passive solar technologies such as attached greenhouses, sunspaces, and direct gain systems provide 50 percent of the apartments' heat. The Center is doing the design work and will be monitoring the system's performance. Money for construction of the units is being provided by the builder.

To further commercialization of solar ry, the Center is also implementing a plan in o city areas, including Atlanta, to establish a design committee composed of local architects, engineers, and planners. The Committee will design a typical suburban home that uses passive solar technologies for space heating.



The house will be built as a demonstration program by local builders. System performance will be monitored and workshops on experience gained from the project will be conducted.

Critique/analysis: It is hoped that many local groups in the project will become familiar with passive technologies and learn that passive systems work, that they are not difficult to design and build, and that they sell.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	GA
Project Name	Southwest Georgia Community Action Agency

The Southwest Georgia Community Action Agency has several programs currently underway or in the planning stages. They have developed a solar greenhouse training program for their weatherization crews. To date, they have constructed two solar greenhouses and have been directly responsible for the construction of a third on a private residence. One of the trainees from the original program will be conducting additional workshops on solar technology.

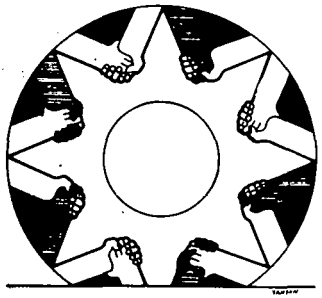
The greenhouses have been performing well. In one residence, a 600 ft^2 house that had been completely weatherized, the greenhouse provides almost 100 percent of the daytime heating and 50 percent at night. In many rural houses, the addition of a solar greenhouse not only supplies a large percentage of the heat for the house, but also increases the living area and may provide a considerable amount of food for the family.

The greenhouse design minimizes the problem of over heating in hot summer climates. The greenhouse roof is a solid structure, heavily insulated, and reflective to minimize over heating. The south-facing front of the greenhouse is hinged in order to provide ventilation on hot days.

The Southwest Georgia CAA has also been working under a $1,500 NCAT grant on developing and testing low-cost solar domestic water heaters. developed eight designs, ranging from ic pipe embedded in roofing tar to systems similar to those available commercially. The emphasis of their program has been to develop a collector that is low-cost, yet efficient and easy to operate.

Organization	Southwest Georgia Community Action Agency
Address	Box 1219 Moultrie, GA 31768
Contact	Chandler Monk
Telephone	(912) 985-3610

Funded By	Community Services Administration
Cost	$1,500
Congressional District	II
Compilation Date	February 1980



A prototype collector consisting of an insulated wood frame, copper tubing and ultraviolet resistant plastic glazing is the most promising. Its $300 cost would provide a payback period of about three years. The system uses potable water and feeds directly into the tank of a conventional water heater. The system uses an electric water pump and has an automatic drain-down unit. The Southwest CAA is currently working on funding mechanisms so that private individuals can borrow money for the water heater and have the monthly energy savings cover the cost of the monthly loan payments.

Renewable Resources— A National Catalog of Model Projects

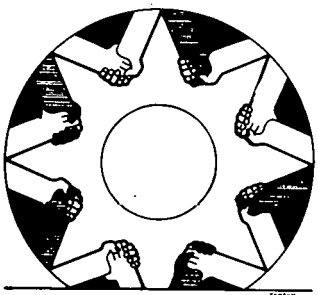
Category	Outreach
State	GA
Project Name	SUN/REP

Southern Unity Network/Renewable Energy Projects (SUN/REP) is a regional, non-profit organization acting in the public interest as an advocate for appropriate technology and as a resource base/clearinghouse for community groups in the Southern United States. The organization's 22-person board is comprised of state and local group leaders and community organizers.

SUN/REP performs an important advocacy role by offering individuals and community groups expert assistance in developing and implementing community participation in AT; offering technical guidance in the development of local AT projects, writing grant proposals, and seeking funding; providing a clearinghouse for information, collection, and exchange on AT projects across the Southern United States.

The Sun/REP newsletter is becoming well-known in the region for timely issue articles and comprehensive coverage of various state group activities. Ron Mitchell serves as publications director for the organization and Len Levine is administrative director.

Organization	SUN/REP
Address	3110 Maple Drive, NE Suite 412 Atlanta, GA 30305
Contact	Merle Lefkoff Len Levine Ron Mitchell
Telephone	(404) 261-1764
Funded By	n/a
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



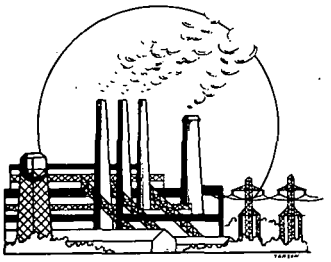
Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	GA
Project Name	"Answer Houses"

Beginning in 1976, Georgia Power built four "answer houses" in Macon, Atlanta, Augusta and Columbus. Each house contained an active solar water heating system designed to provide up to 75 percent of its hot water needs.

The Atlanta "answer house" uses additional solar panels on the roof to heat a 3,000-gallon water storage tank which, along with an electric back-up system, provides space heating. In summer, the water is chilled by an electric compressor, which runs at night to cool the house.

Organization	Georgia Power Co. (GPC)
Address	270 Peachtree St. P.O. Box 4545 Atlanta, GA 30302
Contact	Bill Davidson
Telephone	(404) 522-6060
Funded By	n/a
Cost	$18,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	GA
Project Name	GPC Atlanta Office Building

Organization	Georgia Power Co. (GPC)
Address	270 Peachtree St. P.O. Box 4545 Atlanta, GA 30302
Contact	Walter Hensley
Telephone	(404) 522-6060

Funded By	DOE ($560,000)
Cost	$41/ft^2
Congressional District	V
Compilation Date	February 1980

February 1980

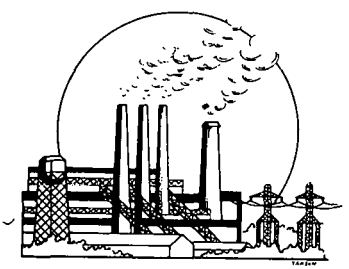
The new, 24-story Atlanta Office Building of the Georgia Power Co., currently under construction, will contain what is believed to be the world's largest application of concentrated solar collectors for heating, cooling, and water heating in a commercial structure.

Adjacent to the office tower will be a three story low-rise section containing 24,000 sq. ft. of medium-temperature parabolic trough solar collectors, mounted on its 67,000 ft^2 roof. Energy collected in this system will be used in conjunction with, or in place of, the conventional heating, cooling, and hot water systems.

Chilled water produced at night during off-peak hours will be held in a 300,000-gallon storage tank for use the next day in meeting the cooling needs of the building. A 1,500-gallon domestic water heater with solar heat exchanger and electric back-up is included in the design.

An absorption chiller will utilize solar heat for cooling. The solar energy system is expected to displace approximately 15 percent of the total energy requirements for the Atlanta Office Building. Up to 30 percent of the energy required for building cooling will be met by the system, significantly reducing the electrical needs of the building during peak demand hours.

The building is designed and oriented to significantly reduce heat loss and heat gain. Double-pane insulating glass will be used on the exterior, reflecting 80 percent of the solar heat away from the building while admitting natural daylight. Other energy conserving features include sodium lights (where practical), a central computer for energy management, limitation of 24-hour functions to the three-story annex.



The building is expected to use 45 percent less energy than a similar conventional structure.

Renewable Resources—A National Catalog of Model Projects

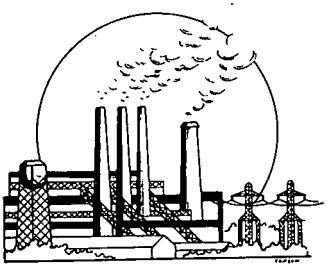
Category	Utility
State	GA
Project Name	GPC South Fulton Headquarters

The Department of Energy and Westinghouse Corporation are assisting in developing a photovoltaic solar conversion system to supply up to 15 percent of the total energy requirements for the Georgia Power Company's new South Fulton Operating Headquarters.

The facility will utilize a tracking system and concentrating lenses to focus sunlight on silicon solar cells. Peak electric power output will be 50 kilowatts. The facility will provide offices for approximately 60 Georgia Power employees, including customer accounting personnel, meter readers, distribution engineers and line crews.

The scheduled completion date is June of 1980.

Organization	Georgia Power Co. (GPC)
Address	270 Peachtree St. P.O. Box 4545 Atlanta, GA 30302
Contact	Walter Hensley
Telephone	(404) 522-6060
Funded By	n/a
Cost	$18,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

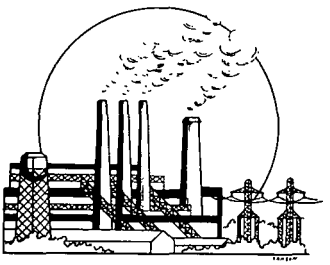
Category	Utility
State	GA
Project Name	The Solar Total Energy - Large Scale Experiment
Organization	Georgia Power Co. (GPC)
Address	270 Peachtree St. P.O. Box 4545 Atlanta, GA 30302
Contact	Walter Hensley
Telephone	(404) 522-6060
Funded By	DOE GA Power Company
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

The Solar Total Energy - Large Scale Experiment (STE-LSE) is a project, funded by DOE Energy and operated by the Georgia Power Company, to provide solar-derived electrical and thermal energy to a knitwear factory operated by Bleyle of America, Inc. The factory, initially equipped with its own independent (conventional) energy source, will derive approximately 65 percent of its annual energy needs from the solar system when it becomes operational in 1981. The site, selected by competitive proposals, is located in the industrial park of Shenandoah, Georgia.

The STE-LSE consists of a 5.7 acre field of 23 ft. diameter parabolic dish collectors designed to provide approximately 3½ megawatts thermal power and 300 kilowatts of electricity. The system will supply 337 degrees F process steam and a major portion of the knitwear factory's electrical, heating, air conditioning and hot water requirements. The plant is scheduled to expand to 42,000 sq. ft. and 300 employees.

The system operates by circulating a fluid through the tubes of the parabolic dish collector. As solar energy is focused on the collectors, the fluid is heated to approximately 750 degrees F. It is then pumped to a heat exchanger for immediate use, or to a thermal storage system for later use.

The land has been provided at no cost by the Shenandoah Development Corporation for exclusive use by the U.S. Government for the term of the agreement.



Georgia Power and the Department of Energy share site costs on a 50-50 basis for those activities of common interest. Additional services are provided to DOE by Georgia Power and their participants on a reimbursable basis.

Once in the heat exchanger, the fluid boils and heats a working fluid that produces the steam required for operating a turbine that in turn drives an electrical generator. The generator provides electricity for the knitwear plant and the solar system.

During the power generation phase, some of the steam is extracted for use as process steam in the knitwear manufacturing process. Exhaust steam from the turbine is passed through a condenser to produce hot water for heating, domestic use, and absorption air conditioning.

The knitwear plant incorporates several energy conserving features including minimum window area, walls insulated to R-20, ceilings to R-33, a reflective roof, and four feet of earth berming. Compared to a conventional building, the energy savings due to conservation amount to 46 percent.

STE-LSE provides the Bleyle plant with 33 percent of its electrical, 60 percent of its process steam, 89 percent of its cooling, and all of its heating needs, approximately 65 percent of the industry's energy needs are met by the plant.

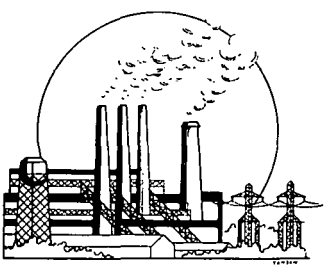
Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	GA
Project Name	Thermal Storage Research

The Georgia Power Plant Yates thermal storage system near Newnan is a project that will relate to future construction of large solar energy generating plants. As part of a major national effort to construct a 10 MW electrical solar pilot plant at Barstow, California, Plant Yates tests the transfer of high temperature heat through two separate storage media, a salt mixture and oil.

Information from the tests will help determine which media can store heat the longest time at the highest temperature.

Organization	Georgia Power Co. (GPC)
Address	270 Peachtree St. P.O. Box 4545 Atlanta, GA 30302
Contact	Bill Davidson
Telephone	(404) 522-6060
Funded By	n/a
Cost	$18,000
Congressional District	VI
Compilation Date	February 1980

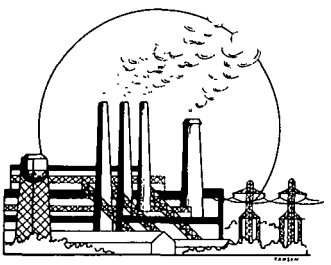


Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	GA
Project Name	Wood Stove Program
Organization	North Georgia Electric Membership Corporation (NGEMC)
Address	P.O. Box 1407 Dalton, GA 30720
Contact	D. Larry Eaves
Telephone	(404) 259-9441
Funded By	Tennessee Valley Authority
Cost	$5.3 million
Congressional District	IX
Compilation Date	February 1980

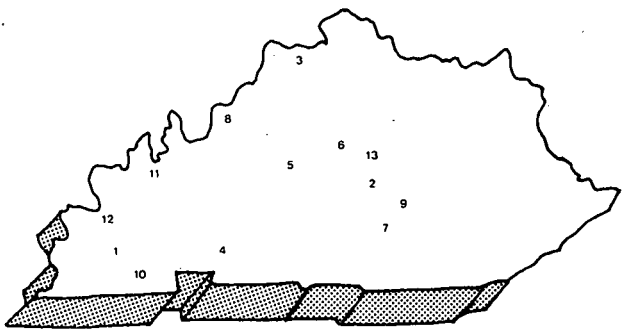
The Tennessee Valley Authority is conducting a program in cooperation with the North Georgia Electric Membership Corporation (NGEMC), to offer interest-free loans to NGEMC electric customers for the purchase and installation of wood-burning stoves. To be eligible for the program, a NGEMC customer must be currently using electricity for heating and may be asked to supply information on the costs and savings of heating with wood.

A customer first calls NGEMC and arranges for a free inspection. The utility then supplies the customer with a list of approved wood stove manufacturers, installers and dealers. (To be listed, a stove must meet certain minimum performance and safety standards.) After the inspection, the customer calls the chosen dealer and arranges for the installation. NGEMC pays the costs; customers repay the loan through monthly installments as part of their electric bill.



KENTUCKY

1. Benton
2. Berea
3. Carrolton
4. Golden Pond
5. Lebanon
6. Lexington
7. Livingston
8. Louisville
9. McKee
10. Murray
11. Owensboro
12. Paducah
13. Richmond



KENTUCKY

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Category	Commercial
State	KY
Project Name	Heublein Warehouse Active Solar Space Heating System

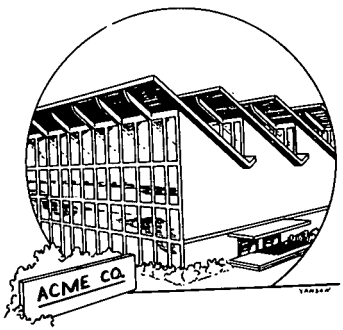
Heublein, a liquor-bottling company, decided in 1978 to heat a "finishing" warehouse with an active solar system. Maintaining a temperature above 60 degrees in the warehouse was not necessary, since liquor is an anti-freeze product.

The system began operating in early 1979. About 12,000 ft^2 of collectors were made on site to heat the 100,000 ft^2 building. The only other heat in the building is a series of heaters above the dock doors.

Company officials are basically satisfied. However, heat storage has proved to be a problem. When heated air is ducted into concrete pipes under the floor, heat loss is significant. Either the heat-storage material is not correct or there is not enough surface area to trap the heat.

Organization	Heublein, Inc.
Address	5000 Charter Oak Dr. Box 1617 Paducah, KY 42001
Contact	Stephen Woolbert
Telephone	(502) 442-9404

Funded By	Entirely by the company
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Commercial
State	KY
Project Name	Western KY Gas Company's Experimental Active Solar Systems

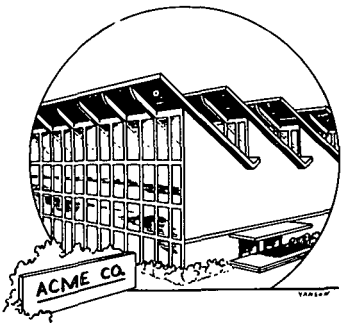
The Western Kentucky Gas Company, a natural gas distributor, is experimenting with two prototypes of active solar air systems to be integrated with gas heating.

The company feels that 10,000 extra customers could be served by the company if solar facilities were part of the home. Presently, the company is restricted from expanding its customer load.

The experiments were designed to improve solar house aesthetics, to increase the dependability of solar heating, and to reduce front-end capital costs.

One system is on a residence and the other is on a company office-warehouse. The systems are operating well, according to Western Kentucky Gas, but not yet on a competitive basis.

Organization	Western KY Gas Company
Address	311 West 7th Owensboro, KY 42301
Contact	Robert Combs
Telephone	(502) 684-8811
Funded By	Entirely by company
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	KY
Project Name	Richmond Energy Alternatives Assessment

Richmond is one of four communities funded by the Department of Energy to take an inventory of present energy usage, to educate the community on solar energy, and to gauge the public response to increased solar usage.

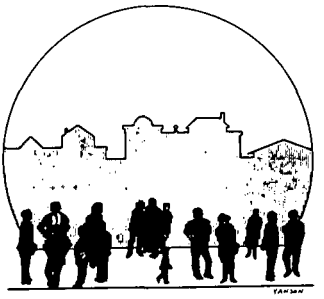
Solar Options--A Local Assessment sprang mainly out of the Eastern Kentucky Unversity Political Science Department. Strong support was added by the head of the Richmond Community Development Office and the Kentucky River Foothills Community Action Agency.

The one-year project began in the spring of 1979. In November and December of 1979, ten solar fairs were conducted. At these events, 500 people signed up as "interested" parties. In February-March of 1980, workshops were scheduled in window coverings, domestic water-heating construction, greenhouses, and energy conservation.

A broad-based committee of dozens of organizations has been formed in this community of 14,000 people. More people than expected were interested in "hands on" solar technologies.

A report will be compiled by May of 1980 that will include data on the amount of energy imported into Richmond and the amount of consumer energy money exported from the county.

Organization	"Solar Options - A Local Assessment by Richmond, KY"
Address	311 Wallace Building Eastern KY University Richmond, KY 40475
Contact	Janet Patten or Polly Gage
Telephone	(606) 622-1129 or (606) 622-1180 or (606) 622-5931
Funded By	DOE: Community Technology Assessment Program, Oak Ridge, National Laboratory
Cost	$70,000
Congressional District	V
Compilation Date	February 1980



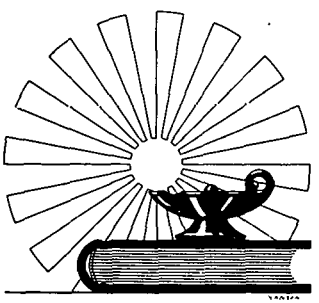
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	KY
Project Name	Appropriate Technology Talks for High School Students

This non-profit group-planning cooperative community, Co-opers, Inc., offers classroom talks on appropriate technology. The audio-visual program describes cooperative efforts. Talks include those on the exploration of alternative energy sources such as solar greenhouses, dry toilets, and earth covered houses. Small groups of upper level high school students are preferred.

Organization	Co-opers, Inc./ Friendly Homes
Address	111 Bobolink St. Berea, KY 40403
Contact	James Wyker
Telephone	(606) 986-8000

Funded By	n/a
Cost	n/a
Congressional District	V
Compilation Date	February 1980

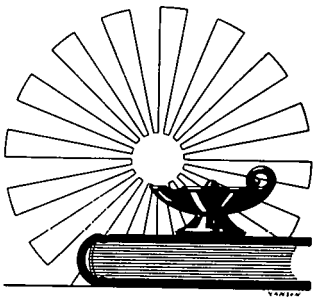


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	KY
Project Name	Center for Environmental Education

The Center for Environmental Education offers energy workshops for teachers, in-service curriculum development and enrichment, and consultant services. Special programs include the Energy Environment Simulator and a fully equipped "environmental van" that is staffed by Center personnel, and which visits individual schools. An extensive collection of materials on energy, including curriculum guides, audio-visual aids, simulation games, and laboratory kits, may be borrowed by teachers. Programs from one-half hour to all day in length can be arranged for all grade levels. Courses in energy-related subjects are offered through the University.

Organization	Murray State University
Address	Murray, KY 42071
Contact	Shaw Blankenship
Telephone	(502) 762-2747
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



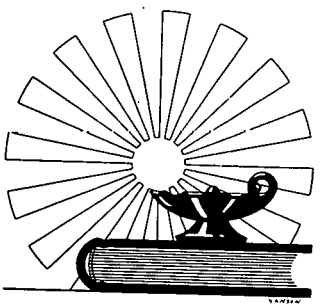
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	KY
Project Name	Energy Education: Lectures and Information

The Louisville Community Design Center, Inc., a firm concerned with alternative energy sources, energy-conservation projects, and strategies for making the benefits of such technology more accessible to low and moderate-income people, offers classroom talks and information on cost-conscious ways to design energy-conserving buildings.

Organization	Louisville Community Design Center, Inc.
Address	Box 752 Louisville, KY 40201
Contact	Carol L. Toner
Telephone	(502) 584-6471

Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



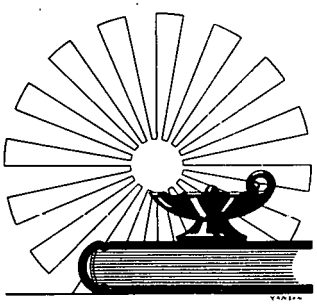
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	KY
Project Name	Jefferson County Energy Education Services

Jefferson County Energy Conservation Office offers an information-retrieval and speakers service on energy management, solar and appropriate technology, alternative energy, and transportation. Free printed materials (such as classroom activities lists, guides, and bibliographies) on energy education, including energy audit materials, are available. So is a list of energy films available from various sources.

Staff are on hand to assist with seminars and teacher workshops. The library resource center contains brochures, pamphlets, periodicals, books and solar and energy-conservation slide-show programs.

Organization	Jefferson County Energy Conservation Office
Address	200 South Fifth Street Louisville, KY 40202
Contact	Noel Rueff
Telephone	(502) 581-3764
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



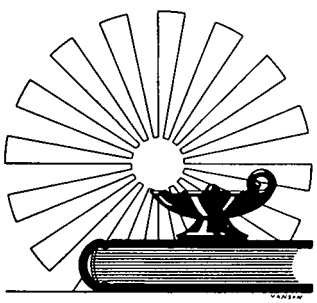
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	KY
Project Name	Traveling Energy Lecture Demonstration for Schools

The Energy Education Division of Oak Ridge Associated Universities offers a traveling energy lecture demonstration, "Energy; Today and Tomorrow." This fast-paced and entertaining educational program covers the nature of energy fuels, methods of generation, possible future methods of generation, and environmental, social, and economic problems associated with energy use and energy conservation. The program will visit a school for a full day for both classroom and assembly sessions. It is applicable to classes in humanities, social sciences, and natural sciences at both the junior and senior high school levels.

Organization	Oak Ridge Associated Universities, Energy Education Division
Address	Box 117 Oak Ridge, TN 37830
Contact	Arthur C. Bailey
Telephone	(615) 576-3031

Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

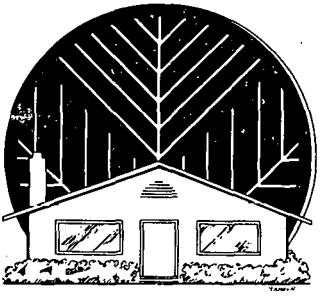
Category	Housing
State	KY
Project Name	Greene's Solar Farmhouse

Michael Greene built a two-story addition to a small tenant farmhouse using recycled half timbers. Its five site-built, roof-mounted collectors (total area 160 ft^2) provide about 50 percent of the building's heat requirements. A woodburning stove, which is the heat source for the original building, supplements the collector heat. The cost of materials was under $1,000 for the panels, J-flex duct, rock storage bin, and 1/3-horsepower squirrel-cage fan.

Critique/analysis: Greene calls the project successful mainly because of its simplicity and low cost. However, he would use passive solar designs next time or build the collectors at the same level as the storage area. Problems have been encountered with air movement and controls.

Organization	Michael Greene
Address	Route 5, Newman Road Lexington, KY 40511
Contact	Michael Greene
Telephone	(606) 272-1907

Funded By	Private
Cost	$1,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	KY
Project Name	Levine Solar Residence
Organization	Richard S. Levine Assoc. Professor
Address	University of Kentucky, College of Architecture Lexington, KY 40506
Contact	Same as above.
Telephone	(606) 272-6444
Funded By	Private
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

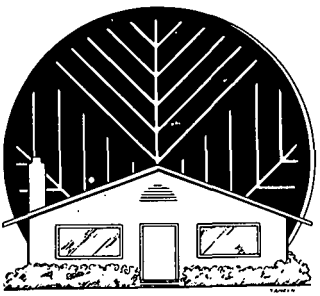
The residence of Richard Levine in Fayette County may well be the most distinctive solar house in Kentucky, in design and in performance. Its 32-foot active collectors are sandwiched by windows called "sundows", that are fitted with self-closing indoor shutters. Heated air is ducted to a three-tiered storage that accepts different levels of temperatures. The long collectors are also multi-stage: as the heated air rises in and around the absorber plate, the design of the collector's interior changes.

The sundows are made of rigid insulation board enclosed in wood and attached to a lever and a cylinder of wax. Temperature changes open and close the sundows without manual attention or power sources.

The Levine house, which also includes two studios in its 3,500 square feet of floor space, features a solar greenhouse, insulated windows, and a heat-circulating fireplace that operates like a stove.

Computer analysis of the building indicates that 99.6 percent of the heat can be derived from the sun.

Critique/analysis: Levine says the active and passive combination components make the house cost effective.

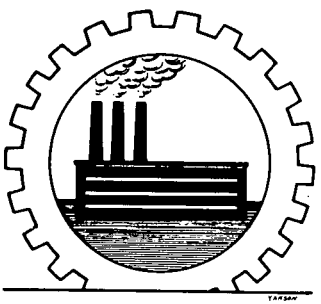


Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	KY
Project Name	Dow Corning Office/Lab Active Solar Domestic Hot Water System
Organization	Dow Corning Corp.
Address	U.S. Highway 42 Process Research & Engineering Bldg. Carrollton, KY 41008
Contact	Dan Bourrie
Telephone	(502) 732-4371, ext. 363
Funded By	Entirely by company
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

In 1978, Dow Corning began operating an active solar domestic water system for their entire Process Research and Engineering Building. It was initiated to demonstrate the applicability of solar energy technology in a semi-industrial situation, to demonstrate use of a silicone fluid in solar flat-plate collectors, and to participate in the overall energy-innovation policy of the corporation.

Company officials say the system works. It is not quite economical, but that is because it was over-designed by a factor of three.



Renewable Resources— A National Catalog of Model Projects

Category	Industrial
State	KY
Project Name	Genco Solar Space-heated Warehouse

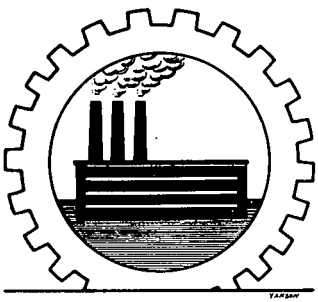
Genco, a general construction firm, wanted to heat a warehouse that would maintain a general temperature of around 55 degrees. It constructed a 7,200 ft^2 building whose entire concrete south wall serves as a trombe wall. The wall is covered by two layers of fiberglass constructed on site with wood battens. The 2,400 ft^2 collector has five-inch holes spaced every 18 inches.

The system became operational in January of 1978. In December of 1977 the electric heating bill for the warehouse and attached office was $500; during February of 1978, the heating bill was $68. The projected pay-back period of five years has been changed to two years. The trombe wall is also preheating office air connected with a heat pump.

Critique/analysis: The owners feel that while a success, the eight-inch concrete wall does not store heat long enough. Consideration should be given to lightweight aggregate concrete, thicker walls, or the use of eutectic salts. Presently, the heat gained directly by the trombe wall during the day is collected in a manifold and ducted by two fans to the center of the warehouse.

Organization	Genco
Address	Box 34307 Louisville, KY 40232
Contact	Larry Andriott
Telephone	(502) 968-3686

Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	KY
Project Name	Buncomb Solar Day Care Center

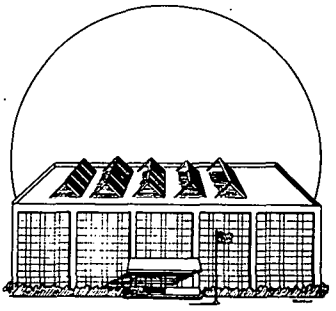
This two-story day care center, completed in August of 1979, demonstrates to the area residents an awareness of energy conservation and solar power.

Sarah House Tate and Gregory Fitzsimons of Nicholasville designed the hybrid passive-active solar building. Its solar systems should provide 60 percent of the building's space heat and some preheating for domestic water.

Passive features include air locks, an attached solar greenhouse of 250 ft^2 interior masonry, and insulated block walls on the exterior. The active system has a cylindrical rock bin with 166 ft^3 of river gravel.

Critique/analysis: The architects would use a total passive system with a trombe wall if they were to do it over. The active system experienced control problems.

Organization	Buncomb Day Care Center Appalachian Communities for Children
Address	Box 419 McKee, KY 40447
Contact	Anna Hobbs or Coreen Brewer
Telephone	(606) 287-7117
Funded By	Save The Children, donations, state coal severance taxes to county
Cost	$149,000 $15,000 from coal tax
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	KY
Project Name	Land Between the Lakes Recreation Area
Organization	Tennessee Valley Authority, Land Between the Lakes
Address	Golden Pond, KY 42231
Contact	Michael Harris, Keith Pardue, Paul Russell
Telephone	(502) 924-5602
Funded By	LBL's Capital Budget; TVA's Solar Application Branch in Chattanooga, Tenn.; Department of Energy
Cost	n/a
Congressional District	I
Compilation Date	February 1980

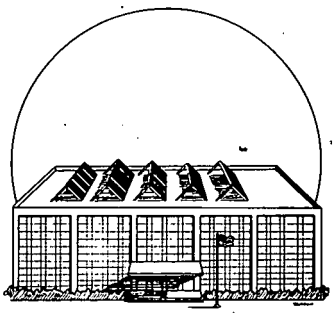
The most numerous and varied energy-efficient projects in Kentucky are located in a large recreation area called Land Between the Lakes (LBL), a 270,000 acre strip of land that spans most of western Kentucky and part of western Tennessee. Operated by the Tennessee Valley Authority (TVA), it has a score of low-energy projects ranging from standard solar space-heating to wind power, electric vehicles, solar campground showers, an underground building and wood chip-powered air conditioning. All projects have been initiated since 1978, offsprings of a goal set by the LBL management to reduce electricity consumption 50 percent by 1985.

The energy programs involve most of the 200-person year-round staff and the 100 seasonal employees. Energy education programs are aimed at the two million yearly visitors to Land Between the Lakes.

The first step toward an active policy at Land Between the Lakes was a $14,400 energy audit. It determined electricity usage in all structures and recommended retrofitting methods with net savings. The retrofitting program includes insulation, weatherstripping, caulking, lower ceilings, double glazing, fluorescent interior lighting, and high pressure sodium vapor exterior lighting.

The recreation area's largest solar-heating system is comprised of 2,000 square feet of flat plate collectors. They are placed on the $3 million new Central Visitors Center, the main stopping-off point for tourists.

The hot water generated by the collectors is used to heat the building in winter, cool the building via an absorption chiller in the



summer, and heat domestic water. The system is backed up by a water-to-water heat pump. Although the system was completed in September 1979, engineers are still working to raise efficiency to design standards.

On a smaller scale, four water-type collectors to heat domestic water and fourteen air-type collectors for space heating are being installed on Shop Building Two at the Maintenance Center. Warmed air is stored in rock bins. All control components and collectors are fabricated on site. (TVA officials said they would redesign the collectors for better efficiency if they were to re-do the project.)

LBL's Piney Family Campground and the Hillman Ferry Family Campground have some solar heated showers. Also, commercially available solar domestic water-heating systems have been installed in the Administrative Offices and the Empire Farm Interpretive Center. The Farm Center is an educational project incorporating dozens of the latest energy-efficient practices for the modern farm. The campground, office and farm projects cost $17,000. A 28-minute film shown continuously in a theater explains the recreation area and the energy features. Energy interpretation displays are mounted throughout the building.

In May of 1979, six small electric vehicles were purchased by the recreation authority for $2,600 each for short distance travelling. The LBL's gasohol program, which involves 300 vehicles, began April 1 of 1979. It includes sedans, trucks, farm tractors, lawn mowers and mopeds. No noticeable changes eration or maintenance have developed.

Other transportation alternatives at the recreation area include the small fleet of six bicycles and three mopeds for staff use, and the vanpool and carpool plan. The first

van began operating in October of 1978. Transportation costs in this program amount to less than 3¢ per person per mile. About 35 percent of the funding is paid by TVA; the balance by riders based on round-trip mileage. More vans are being ordered.

Batteries from the electric vehicles are charged by a wind-powered generator. The $10,000 wind system is a 14-foot diameter, three-bladed, rebuilt 3-kw Jacobs Wind Generator set atop a 66 ft. guyed tower.

A wood chip burning system has been installed in a maintenance shop to provide space heating and to show loggers of the potential for their wasted tree tops. The custom built firebox, which burns chips of any moisture content, is currently heating 6,000 square feet and could heat twice that space. Temperatures in the firebox reach 1,200 to 2,500 degrees. The hot gases, which are used to heat the building through an air-to-air heat exchanger, have less than 10 percent of the minimum particulates allowed by EPA. The system, designed by Dr. John Riley of the University of Maine, is thermostatically controlled. Chips are fed by an auger technique. Materials cost $15,000 and installation $15,000.

The furnace in the Patrol Headquarters has a $13,000 wood-fired hot water generator that heats the domestic water, provides space heat furing the winter and cools the space via an absorption chiller in the summer. (Problems have arisen because such a large amount of wood is needed to run the chiller in the summer. Also, the boiler has excess capacity in winter and yet is not big enough to meet summertime needs.) Educating the personnel in wood-fired equipment was necessary.

Energy education is a continuing part of the operations budget. One of LBL's prime attractions is the Empire Farm, a model of rural energy efficiency. The education group has found that solar technology is developing so rapidly that it is difficult to disseminate information in a logical manner.

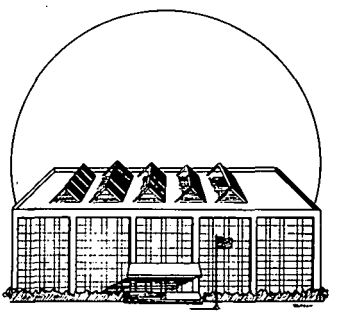
Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	KY
Project Name	Solar Space and Water Heated Retirement Complex
Organization	Lakeland Wesley Village
Address	U.S. Route 68 Route 5 Benton, KY 42025
Contact	Robert Werle
Telephone	(615) 352-2433
Funded By	FHA, TVA, HUD, Community Development Grant, et al
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The Lakeland Wesley Village will be a 96-unit retirement complex built by the United Methodist Church on Kentucky Lake. It is expected to be completed in late 1980 and fully occupied by May of 1981. When finished, it will probably be the largest passive solar multi-unit living space in the United States.

TVA computer modeling shows the complex should use 47 percent less energy annually than will a normal traditionally-fuelled building of the same size. Over a 30-year period, operational savings should net more than $2 million. The emphasis on passive features is expected to provide 84 percent of the space heat required by the apartments. Additionally, an active drain-down liquid system is projected to supply 72 percent of the domestic hot water heating.

A central atrium will allow sunlight to hit the walls of each apartment, all of which face south. Conservation features include R-25 walls, R-45 ceilings, earth-berms and double- and triple-glazed windows. The space-heating back-up is a water-to-air heat pump assisted by a well water heat sink.



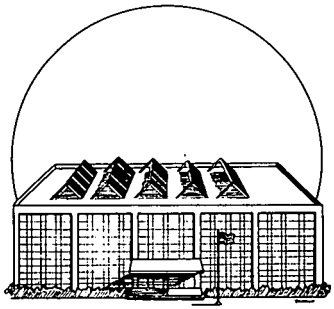
Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	KY
Project Name	University of Louisville Solar Hot Water Heating and Air Conditioning Ur
Organization	The Electrical Engineering School of the Speed Scientific School
Address	University of Louisvill 206 Main Speed Bldg. Eastern Pkwy. Louisville, KY 40292
Contact	Professor Thomas M. Murray, Jr.
Telephone	(502) 588-6281
Funded By	Kentucky Center for Energy Research
Cost	$100,000
Congressional District	III
Compilation Date	February 1980

The University of Louisville has installed 1,000 ft^2 of collectors on the 45 degree sloping roof of a new observatory. Half are painted flat black and half black chrome. Two 3,000-gallon concrete tanks were installed below the basement floor. These storage facilities are used in conjunction with an absorption air conditioner. Multiple mode operations are being investigated utilizing a micro-computer.

The project, begun in January of 1978, was funded at $100,000 by the Kentucky Center for Energy Research.

Critique/analysis: Project Director Thomas Murray said the drain-down system didn't work properly, so freezing resulted. It has now been converted. Murray would isolate the tanks or insulate them better were he to start over.



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	KY
Project Name	Low Income Solar Demonstration and Training Program

This two-county agency is fabricating domestic water heaters, installing them in needy homes, and training a six-man crew in solar techniques. The agency is experimenting with various types of sun-catchers. One that has been particularly successful is a $400 combination solar/wood stove water heater. Another is a thermosiphon unit, and a third is more conventional.

Two more units are being finished while a dozen are on the drawing boards. Cost of materials range from $400 to $1,000. Value of the system when completed is about $1,350.

The solar trainees have also reached about 2,000 students through an educational outreach program in the public school systems.

Critique/analysis: The biggest problems have been funding and some turnover of CETA trainees. A new alternative energy shop in the area is contemplating subcontracting work to the graduates of the program.

Organization	Kentucky River Foothills Development Council
Address	106 East Main Street Box 743 Richmond, KY 40475
Contact	Joseph Rosselot
Telephone	(606) 723-7411 (Irvine) (606) 623-7233 (Richmond)
Funded By	CSA, CETA
Cost	n/a
Congressional District	V
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	KY
Project Name	Appalachia - Science in the Public Interest

Organization	Appalachia - Science in the Public Interest
Address	P.O. Box 298 Livingston, KY 40445
Contact	Al Fritsch, Executive Director
Telephone	(606) 453-2315

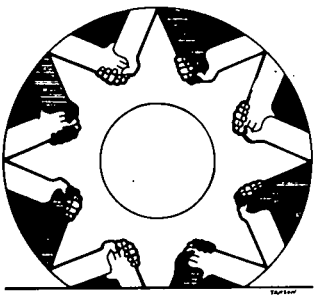
Funded By	Private Donations, Church Funds, Volunteer Work
Cost	$28,000
Congressional District	V
Compilation Date	February 1980

Appalachia - Science in the Public Interest (ASPI) has virtually completed its first resource center, a modified pole house in Rockcastle County with solar and many energy-efficiency features.

ASPI has been establishing citizen contacts and networking for eight years, first out of Washington, D.C., and now in Livingston. In July of 1979, ASPI opened the Appalachian Technical Network (ATN) under the direction of Don Huesman. ATN has listed some 325 specialists and experts willing to help Appalachian citizens and groups solve problems related to energy conservation and alternatives, transportation, land use, nutrition and occupational health. ASPI has been particularly active in opposing strip-mine blasting, proposing controls of toxic chemicals and promoting solar energy.

The two-story center has 1,550 square feet of floor space. Earth-bermed and highly insulated, it has plant racks behind 640 square feet of south-facing window space. It has a ,000 gallon cistern, an indoor non-water toilet system, a wood stove auxiliary, air-lock entrances, two skylights, heat storage with water barrels and a solar domestic hot water pre-heat system.

ASPI plans to build six more resource centers if funds can be raised.



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	KY
Project Name	Central KY Community Action Council
Organization	Central KY Community Action Council (CAC)
Address	225 North Woodlawn Lebanon, KY 40033
Contact	Pat Bishop
Telephone	(502) 692-3336 or (502) 692-9217
Funded By	CSA, CETA
Cost	$116,000
Congressional District	II
Compilation Date	February 1980

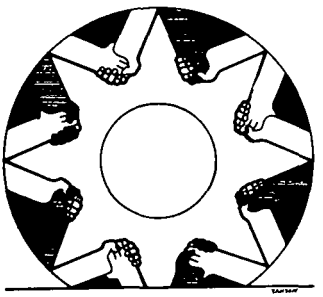
A project of the CAC weatherization crews involves the construction and installation of wood stoves from recycled propane gas tanks. At a materials cost of $95 per unit, these stoves are designed with secondary combustion chambers and a flat plate on top for cooking. Finished stoves are installed to replace dangerous inefficient stoves in houses being weatherized.

As part of this weatherization project, two greenhouses were completed in December of 1979 and two more foundations have been laid for retrofits to existing low-income homes. They measure about 11 x 20 feed and are double glazed with both Kalwall and glass. (One greenhouse was actually over-heating a house until drums of water were placed inside to soak up daytime heat and reduce the night-time temperature dip.)

This weatherizing work is being done by four CETA trainees and one manager at a cost limit of $800 of materials per home.

A new project to be financed at $11,900 through the DOE's Appropriate Technology Small Grants Program will be the energy-retrofit of six mobile homes. The cost will be about $2,200 each. A variety of techniques will include insulated shed-type roofs, outside styrofoam with stucco, add-on greenhouses, and active solar collectors. (Half of Kentucky's "new housing starts" are mobile homes.)

Critique/analysis: During this first year of the program, the right consultants and the correct designs were hard to find. But now the agency will be spending more time in classroom instruction of trainees and doing more field work. Another problem has been to find willing home participants.



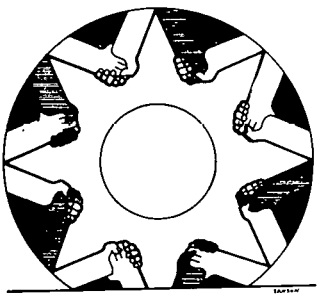
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	KY
Project Name	Kentuckiana Solar Society

The Kentuckiana Solar Society provides classroom talks on solar energy to large group audiences. It also demonstrates solar equipment, heat storage and greenhouses, and it offers consultant services and organizes local projects. Teachers may attend its monthly meetings on solar energy topics.

Organization	Kentuckiana Solar Society
Address	Box 974 Louisville, KY 40201
Contact	David Ross Stevens
Telephone	(502) 945-4496

Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	KY
Project Name	Kentucky Solar Coalition

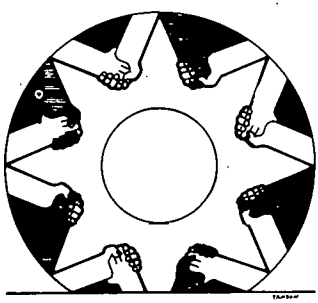
Kentucky Solar Coalition was formed November 10, 1979, in Louisville with the twin aims of educating the public and influencing legislation on renewable energy. Some of the members at the organizing meeting represented groups; others came as individuals.

Subsequent meetings have produced an interim board, the first newsletter, and draft legislation for the Kentucky Legislature.

One of the main functions of the Coalition is networking within the state and outside with the Center for Renewable Resources and SUN/REP in Atlanta.

Eventually, the organization will hire staff, establish an office, and initiate an educational program.

Organization	Kentucky Solar Coalition
Address	303 Jackson St. Berea, KY 40403
Contact	Polly Gage
Telephone	(606) 986-9201
Funded By	Dues
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

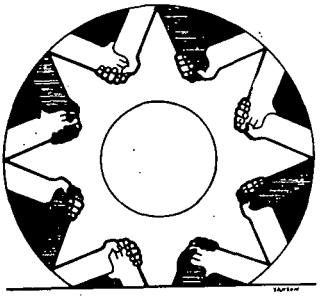
Category	Outreach
State	KY
Project Name	Solar Headquarters for Citizen Action Group
Organization	Environmental Alternatives
Address	800 East Chestnut St. Louisville, KY 40204
Contact	Mary Jo White
Telephone	(502) 587-3028
Funded By	Donations, volunteer labor, grants
Cost	n/a
Congressional District	III
Compilation Date	February 1980

Environmental Alternatives is a citizens action group formed in Louisville in 1969 as a coalition of environmental organizations. Its role has been educational, political, and organizational.

For more than two years, most of Environmental Alternatives' efforts have centered upon retrofitting an old core-city house that was given to the group for $1.

Part of the south wall and roof of this deteriorated house was torn down to make way for a glassed wall-roof that serves as a greenhouse and a second-story buffer to an array of active collectors.

The rehabilitation is expected to be completed in early spring of 1980. It serves as an office for a two-person staff, a meeting place for other civic groups, and a classroom for future energy-environmental seminars.



LOUISIANA

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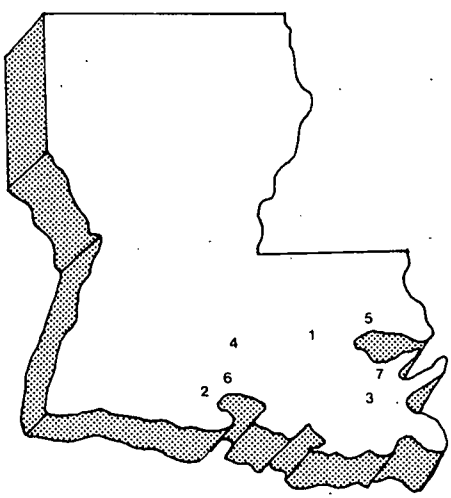
2. Broussard
3. Destrehan
4. Grand Coteau
5. Hammond
6. Lafayette
7. New Orleans



LOUISIANA

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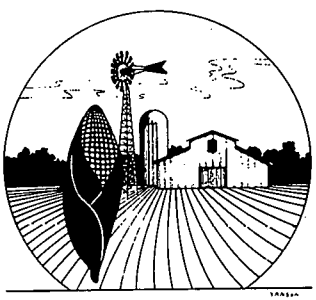
Category	Agricultural
State	LA
Project Name	L.S.U. Methane/ Fertilizer Research

This interdisciplinary research project was granted $100,000 in 1977 by the Environmental Protection Agency and has been refunded for 1978 to undertake a full-scale test of the use of cow manure for combined production of methane gas and fertilizer. The latter is used for growing duckweed, which is in turn used as feed for the cattle.

Organization	Louisiana State Univ. Dept. of Dairy Science
Address	117-A Dairy Science Building University Station Baton Rouge, LA 70803
Contact	Dr. J. B. Frye, Project Coordinator
Telephone	(504) 388-4411

Funded By	Environmental Protection Agency
Cost	$100,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

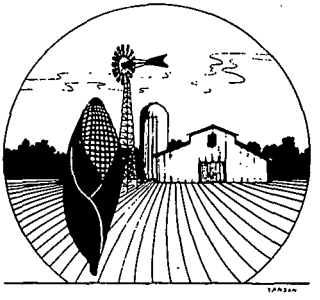
Category	Agricultural
State	LA
Project Name	L.S.U. Methane Research

Louisiana State University now researches fuels from biomass processes, especially the conversion of bagasse and duckweed into methane.

A proposal has been submitted to expand the research to include the conversion of potato peels into methane. A demonstration unit using 10,000-gallon tank-cars as fermenters is currently is currently under construction. Methane will be produced in a two-stage process and will be burned to produce hot water to operate the potato canning factory.

Organization	Louisiana State Univ.
Address	Department of Chemical Engineering Baton Rouge, LA 70803
Contact	Clayton D. Callihan
Telephone	(504) 388-1426

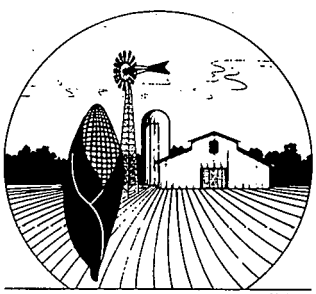
Funded By	Louisiana Department of Natural Resources
Cost	$50,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

This research project in solar grain drying (primarily rice and soybeans) was funded by the State for three years. Currently the project is comparing a home-built air flatplate collector built for $7/sq. ft. with a more expensive air flatplate collector.

Category	Agricultural
State	LA
Project Name	L.S.U. Solar Grain Drying Research
Organization	Louisiana State Univ.
Address	Agricultural and Engineering Dept. Baton Rouge, LA 70803
Contact	Prof. Mansel Mayeux, Project Coordinator
Telephone	(504) 388-3153
Funded By	Louisiana Agricultural Experiment Station
Cost	$35,000/yr
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	LA
Project Name	Lafayette Solar Car Wash

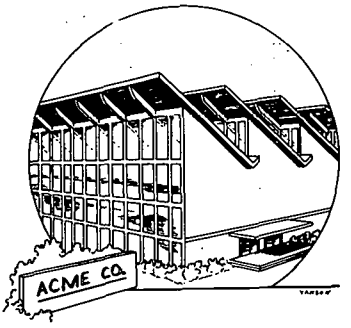
When they doubled the size of their facility in 1978, the owners of this eight-bay car wash elected to use the sun to provide hot water on an experimental basis.

In conjunction with the existing hot water system, eight flat-plate collectors were selected to fill the need. The system back-up was installed with a gas meter to evaluate the cost effectiveness of the solar system.

In the year and a half of operation, the solar-heated system has used 80 percent less gas than the conventional system. With the savings amoritzed for both systems, the operational costs have been greatly reduced for this car wash.

Eventually the original hot water system will be hooked up to the solar system, and an amortization will follow accordingly.

Organization	Fred Harvey
Address	Solar Car Wash 300 Lynn Drive Lafayette, LA 70501
Contact	Fred Harvey
Telephone	(318) 234-5748
Funded By	Fred Harvey
Cost	$7,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	LA
Project Name	Lafayette Energy Exhibit

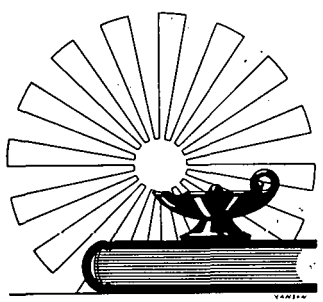
This energy exhibit ran from October 1, 1979 thru January 30, 1980. The exhibit focused on two main areas: energy conservation, and sources of energy. Two thirds of the energy sources section were devoted to the development of renewable energy sources, including the relationship of food and energy, the development of mechanical systems, appropriate designs for the locale, and displays of energy consumption on the national, state, and local level.

The energy sources exhibit centered on all sources of energy available in Louisiana, such as oil and gas, coal, alcohol, methane, nuclear, ocean thermal, hydro power, wind and active and passive solar applications.

Two other sections focused on energy utilization in agriculture, with emphasis on wasteful lawn fertilizer and waste disposal alternatives.

Critique/analysis: The exhibit served as a stimulus for community activity, ranging from an energy poster contest and energy workshops conducted by the local solar group to seminars and the formulation of a community energy plan. Community leaders in the sourrounding area have been encouraged to view the exhibit and adapt it to their communities to promote energy awareness. It nteresting to note that Lafayette, commonly called a "mini-Houston," derives one-half its gross income from the oil and gas industries.

Organization	Lafayette Natural History Museum and Planetarium
Address	Girard Park Drive Lafayette, LA 70503
Contact	Rusty Gaudet, Curator Beverly Latimer, Director
Telephone	(318) 233-6501
Funded By	City of Lafayette, Display Fund
Cost	n/a
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

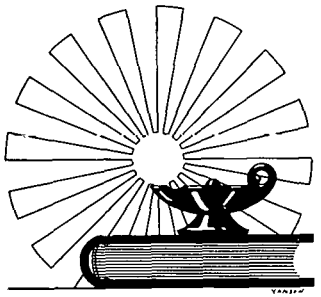
Category	Education
State	LA
Project Name	Louisiana Solar Directory
Organization	Ecology Center of Louisiana
Address	P.O. Box 19064 New Orleans, LA 70179
Contact	Betty Hunter Tabony
Telephone	(504) 948-6453 (504) 482-8760
Funded By	Louisiana Department of Natural Resources
Cost	$700
Congressional District	VI
Compilation Date	February 1980

As a follow-up to "Sun Day," 1978, the Ecology Center of Louisiana, Inc., state sponsor of the event, was funded $700 by the Louisiana Department of Natural Resources to inventory solar energy activities and resources in seven key Louisiana cities. The Louisiana Solar Directory is the result of that inventory.

The purpose of the Louisiana Solar Directory is to promote communication among people interested in solar energy in Louisiana.

Information for the directory was gathered from many sources: the "Yellow Pages," the National Solar Heating and Cooling Information Center, telephone conversations with Sun Day contacts and other people, and newspaper articles. In addition, two questionnaires were mailed: one to solar businesses and another to architects.

To obtain a copy of the Louisiana Solar Directory, write to the Louisiana Department of Natural Resources, Research and Development Division, P.O. Box 44396, Baton Rouge, LA 70804.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	LA
Project Name	Blackburn Solar Residence

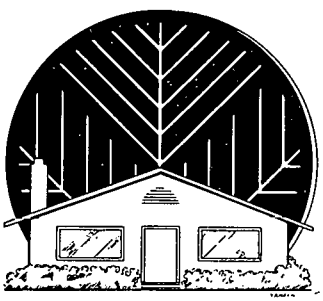
Rusty Blackburn, district geologist for a major oil firm, has designed and built two flat-plate collectors that provide full heating needs for his pool, and supplemental heat for his home during the winter. Blackburn built each collector for $400 during his spare time over a three month period.

Rusty also designed and built a thermosiphoning water heater display for the energy exhibit at the Museum and Planetarium in Lafayette.

Critique/analysis: The Blackburn home is located in a community heavily oriented toward the oil and gas industry. The installation has reportedly provided a new awareness in the community.

Organization	Randolph "Rusty" Blackburn
Address	100 Duncan Drive Lafayette, LA 70503
Contact	Rusty Blackburn
Telephone	(318) 981-3653

Funded By	Owner
Cost	$800
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	LA
Project Name	Crumley Passive Solar Residence
Organization	Reverend William Crumley
Address	Rt. 1, Box 82E Broussard, LA 70518
Contact	Reverend William Crumley
Telephone	(318) 837-1934
Funded By	n/a
Cost	n/a
Congressional District	VII
Compilation Date	February 1980

Reverend William Crumley's passive solar home has been a stimulus and an encouragement for many solar pioneers in Louisiana.

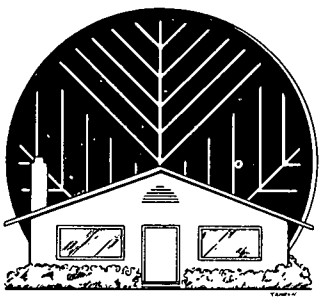
Crumley designed his home "to bring the outside environment into the house." A greenhouse attached to the front of the residence, hanging plants, and skylights in the living room help achieve this end.

The entire roof of the south-facing living room is covered by a dormer, which allows outside light to penetrate the building to a large degree.

"This junction of the inside and outside environments is essential to the successful operations of my house," Reverend Crumley reports. "For example, I need to know if it is sunny or overcast, windy or calm, warm or cool."

Other features of the house include a water heater constructed of 50 feet of garden hose and an insulated box covered with corrugated fiberglass. Both the water heater and water storage tanks are located on the building's roof. Water flows by gravity into the water heater from the tanks; once heated, the water rises back to storage on its own accord.

Rev. Crumley collects rainwater in four barrels located on the roof, and has installed a composting toilet in the house. All electricity in the house is 12 volt DC, provided by ordinary car batteries. Rev. Crumley charges the batteries by rotating them on his truck. He plans to install a wind or solar powered battery charger.



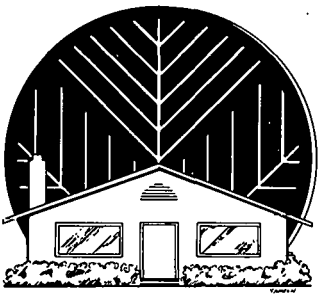
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	LA
Project Name	Hybrid Renewable Energy Residence

This renovation on a two story older home in New Orleans incorporates the following passive design elements: passive east wall two-story solarium, natural ventilation thru the stairwell, and operable skylights that provide natural lighting.

Back-up heat is provided by woodburners. Zoned electrical systems, water restrictors on all fixtures, and an active domestic hot water system are also features of the house.

Organization	Raymond Bergeron
Address	7721 Plum Street New Orleans, LA 70118
Contact	Raymond Bergeron
Telephone	n/a
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

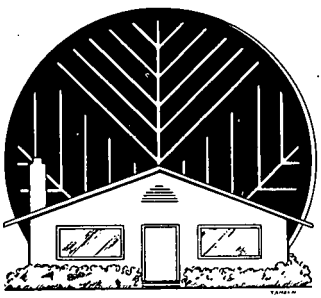
Category	Housing
State	LA
Project Name	Modular Passive Solar Residence Design

A component/modular passive residence design has been developed by Mr. Hebert and is being erected in Lafayette, Louisiana.

Foundation plenum, ice box roof, maximum energy efficiency and proper window overhang and placement are the key components of the small, energy self-sufficient home. The residence can be expanded at a future date.

Organization	Andy Hebert
Address	136 Louisa Blvd. Lafayette, LA 70506
Contact	Andy Hebert
Telephone	(318) 235-9664

Funded By	n/a
Cost	n/a
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	LA
Project Name	Whitehurst Passive Solar Home

Organization	Kathleen Whitehurst
Address	Grand Coteau, LA
Contact	Kathleen Whitehurst
Telephone	(318) 662-7120

Funded By	n/a
Cost	n/a
Congressional District	VIII
Compilation Date	February 1980

Kathleen Whitehurst has built a passive solar home near the town of Grand Coteau constructed of unusual and historic salvaged materials.

The structure, which features a southern wall made almost entirely of double-glazed glass, was built in part from 100-year-old cypress barn wood. The structure's doors and windows were collected on Avery Island; and its oak floors were found in various old homes in Lafayette.

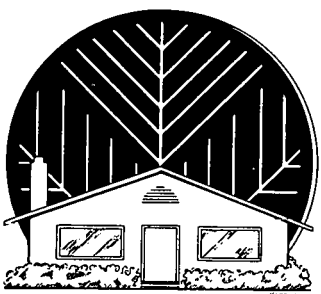
Whitehurst and head carpenter and draftsman, Joie L. Chautin, designed the home to sit on creosote telephone poles. A brick wall skirts the building foundation, effectively closing in a ten-foot space under the house on the south side created by the sloping landscape.

The west wall of the south-facing building consists of 45 percent glass; the east wall contains 40 percent glass. The north wall is well-insulated, having no windows on the main floors, and a row of insulated windows upstairs that can be easily removed in hot weather. Two 3'x6' skylights upstairs provide natural lighting and passive solar heating.

Due to excellent insulation, two woodburning stoves and a fireplace provide all home heating. Reversible ceiling fans circulate warm and cool air between the up- and downstairs.

umbing features include a self-contained composting toilet and a 900-gallon septic tank for grey water.

The house was built around the site's 60-foot oaks, which provide shade and support for the structure.



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	LA
Project Name	LSU Solar Fieldhouse

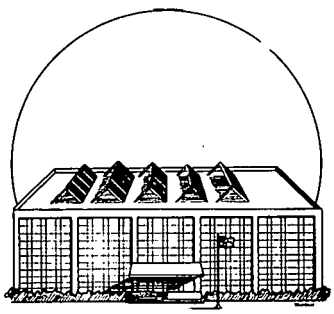
In 1978, Louisiana State University (LSU) installed a 5,560 ft^2 solar system on the roof of its sports fieldhouse. The system is designed to provide 28 percent of the building's space-heating and domestic hot water needs.

Funded by DOE as a Solar Demonstration Project, the 308-collector system was retrofitted to the 66,400 ft^2 facility beginning in 1977. The 3'x6' flat plate collectors and a 10,000 gallon storage tank provide the building with approximately 1,034 x 10^6 Btu yearly. The fieldhouse is widely used for health and physical education classes, recreation, and intercollegiate sports.

Intricate instrumentation that currently monitors the system includes a mini-weather station. The information is fed into NASA's computers in Huntsville, AL.

Critique/analysis: The solar system was not operating at the time of publication due to leaks in the piping joints. LSU officials are working to correct the problem.

Organization	Energy Program Office
Address	105 Hill Memorial Louisiana State Univ. Baton Rouge, LA 70803
Contact	Linda Veal
Telephone	(504) 388-1583
Funded By	DOE (Solar Demonstration Project)
Cost	$301,041
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	LA
Project Name	St. Charles' Parish Library

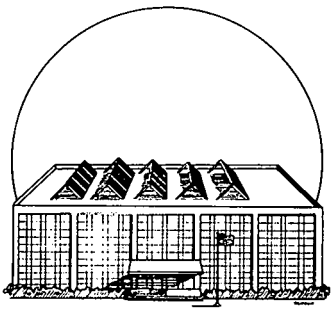
This parish library building has a site-built active solar hot water system that incorporates solar redirector windows in the rack areas. The back-up lighting system is a two-bulb configuration that presently operates manually, although it is hoped that an automatically synchronized back-up system could be set up in the future.

The solar building's architect recently won a lighting design merit award.

The solar hot water system is set up on permanent display, with dials indicating the water temperature.

Financed by a local public bond issue, the project cost $425,000.

Organization	St. Charles' Parish Library
Address	100 River Oaks Dr., P.O. Drawer P Destrehan, LA 70047
Contact	Gary Phillips
Telephone	(504) 764-2366
Funded By	Local Public Funds (Bond Issue)
Cost	$425,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	LA
Project Name	Quad Area C.A.A. Solar Slide Show

With a $500 grant from the Louisiana Department of Natural Resources, Quad Area Community Action Agency (CAA) built and documented steps for construction of a "Heat Grabber" window solar heater.

The slides have been made available to other CAP agencies throughout Louisiana.

Mr. Cucullu has also been instrumental in the retrofit of numerous homes with passive solar-heating techniques.

Organization	Quad Area Community Action Agency (CAA)
Address	P.O. Box 1965 Hammond, LA 70402
Contact	Bob Cucullu
Telephone	(504) 345-5969

Funded By	LA Dept. of Natural Resources
Cost	$500
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	LA
Project Name	S.M.I.L.E. C.A.A. Solar Retrofit Program

Following a solar conference sponsored by the Louisiana Department of Natural Resources, the St. Martin, Iberia, Lafayette Community Action Agency (S.M.I.L.E. C.A.A.) developed a $3,000 grant proposal to implement passive retrofit designs for two weatherized homes. The houses are located in Broussard and New Iberia, LA. Labor was provided by C.E.T.A. employees, mostly unemployable teenagers, under the direction of experienced carpenters.

The homes were designed so they could easily be understood and maintained by elderly, handicapped, and illiterate inhabitants.

The Broussard home is a 200 year old Acadian-style structure. Before the project, the owner, an elderly Cajun woman, used 500 gallons of propane per heating season, and still was not receiving her basic comfort needs. Cole reportedly spent the winter months in her bedroom and kitchen with no hot water. She couldn't afford to operate her hot water heater.

Workers enclosed the front porch with 1/8" acrylic panels that swing open in the summer, effectively creating a solarium on the south face of the house. The solarium provides all of Cole's heating needs in the winter months.

Workers also sealed the crawl space around the bottom of the house with insulated panels that continue two feet into the ground. The tem ure under the floor is thereby maintained at gress.

Material costs amounted to $800, including $175 for structural repairs to the porch/solarium.

In addition, the owner has a combination breadbox-thermosiphoning solar hot water system, constructed for $75. The system is connected to the existing hot water tank.

Cole's energy use the first winter after

Organization	St. Martin, Iberia, Lafayette Community Action Agency (S.M.I.L.E. C.A.A.)
Address	501 St. John Street Lafayette, LA 70501
Contact	Frank Neelis
Telephone	(318) 234-3272

Funded By	Community Service Adm., DOE, La. Department of Natural Resources
Cost	$1,600 (approx.)
Congressional District	VII & III
Compilation Date	February 1980

retrofit/weatherization was reduced from 500 gallons of propane to 75 gallons. This included cooking needs.

The McGlothin house in New Iberia, Louisiana, was in such structurally bad condition as to be considered beyond repair by the CDBG program. The decision was made to concentrate only on that part of the house that Mrs. Lillian occupied primarily in the winter months. Again swing panels were incorporated on the porch area, providing a solarium space for Mrs. Lillian.

A hole with an insulated door was incorporated into the north wall of the bedroom for cross-ventilation in the summer.

Material costs for the project were $400. Labor was provided by C.E.T.A. and an experienced carpenter.

Utility consumption in the first winter after retrofit was reduced by 75 percent. Heaters in the solarized areas were not used during the winter.

Critique/analysis: These demonstration homes have drawn considerable media coverage. A proposal is presently being considered that will extend this demonstration into a full scale program of 100 homes.

Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	LA
Project Name	Gulf States Energy Conservation Program
Organization	Gulf States Utilities Company
Address	P.O. Box 2431 Baton Rouge, LA 70821
Contact	
Telephone	(504) 387-5451 Ext. 220
Funded By	Utility (GSU)
Cost	n/a
Congressional District	VI
Compilation Date	February 1980

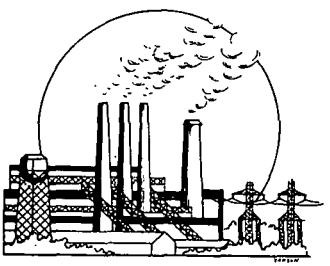
Gulf States Utilities (GSU), a private Texas utility serving a large part of south Louisiana, has taken serious steps to develop a comprehensive energy-conservation program. It has several major programs presently under way. One is the establishment of energy information centers designed to demonstrate concepts for maximizing energy efficiency using various types of material and equipment. These materials, along with different construction features, are on display in the Centers, most of which are located in the display areas of the company's offices.

Energy conservation information is provided to GSU's customers through the utility's Project Conserve. Customers first fill out an energy questionnaire. A computer printout is then sent to the consumer describing specific areas of energy deficiency. A cost analysis of what can be done to make the home more energy-efficient is also provided.

Other GSU projects include construction and monitoring of two energy research homes utilizing passive solar techniques and other energy efficient designs.

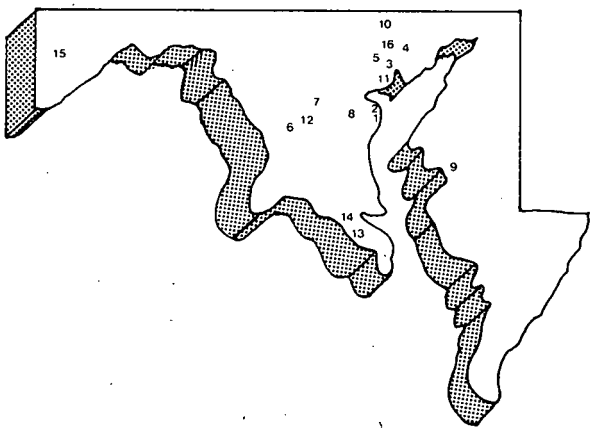
A recent GSU program involves the development of an energy van, outfitted with a solar collector on its roof. This vehicle carries energy displays to trade conferences, schools, and energy expositions throughout the area.

Critique/analysis: It should be noted that GSU has a commitment to build a nuclear power plant outside Baton Rouge.



MARYLAND

1. Annapolis
2. Arnold
3. Baltimore
4. Bel Air
5. Catonsville
6. College Park
7. Columbia
8. Crofton
9. Easton
10. Freeland
11. Glen Burnie
12. Laurel
13. Leonardtown
14. Mechanicsville
15. Oakland
16. Towson



MARYLAND

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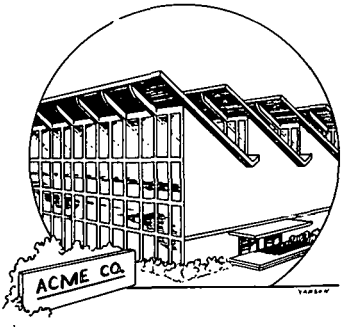
Category	Commercial
State	MD
Project Name	Turock Enterprises

Since July of 1979, a new business with important implications for the Northeastern United States has been in operation. It involves a construction process that is labor intensive and well-suited for deployment by small businesses or cottage industries with start-up costs under $20,000.

Using a small, hand-operated brick-making machine and a sun-cured process, Turock Enterprises has demonstrated that cement bricks and imitation stone can be made and sold competitively in part of the country that has traditionally required energy intensive, kiln-drying due to the rigorous winters. The brick and imitation stone have met the appropriate building material standards and have been well received by the customers.

As techniques for using solar energy principles for winter production become more refined, Turock plans to employ from four to ten people. (It now has three employees.) At this point, details of the processs are not being made available because the personal costs and risks to the individuals involved are considerable. As their expenditures are recovered, they will be more than willing to share information with appropriate groups. In the meantime, more information is available from Daniel Fecko, Turock Enterprises, Box 3343, Crofton, Maryland 21114.

Organization	Turock Enterprises
Address	Box 3343 Crofton, MD 21114
Contact	Daniel Fecko
Telephone	(301) 721-1890
Funded By	Private
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	MD
Project Name	Columbia Open Space Forum

Planting trees to reduce energy consumption and to control erosion is a major activity of the Columbia Open Space Forum, an organization representing the local village open space committees in Columbia, Maryland.

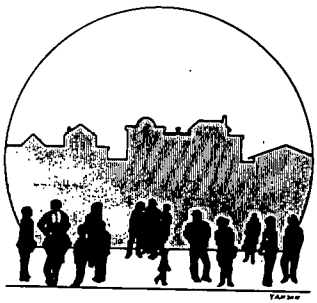
Planting trees reduces energy consumption in two ways. The heat load on roads and the need for air conditioning in houses is decreased by the strategic use of deciduous trees. And, by planting trees instead of grass, the city can save money: tree maintenance requires less for labor, equipment and fuel than grass mowing operations do. Columbia currently spends over $500,000 annually on these types of maintenance tasks.

Besides reducing energy consumption and saving maintenance funds, tree planting also aids in erosion control and, by checking the inflow of silt, lawn fertilizers, and other materials helps to maintain good water quality in nearby lakes.

The Columbia Open Space Forum helps weatherize homes, creates wildlife habitats, and engages in a variety of other educational-oriented projects.

Organization	Columbia Open Space Forum
Address	5690 Thicket Lane Columbia, MD 20144
Contact	E. M. Risse
Telephone	(301) 997-2577 (home) 596-4515 (office)

Funded By	Columbia Association / Volunteer Effort
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



The Your, Our Daily Planet has been well received by the community and its circulation is growing. With initial runs of 1,000 12-page copies, current runs consist of 5,000 28-page copies. The paper has increased in size and is attracting more and better contributions.

Obtaining enough money to break even on each has been the major problem of the paper. Another difficulty, typical of many such projects, is in attracting and keeping a competent but voluntary staff. To date, the paper has managed to overcome this problem.

Renewable Resources— A National Catalog of Model Projects

Category	Community
State	MD
Project Name	The Your, Our Daily Planet Newspaper/Magazine
Organization	The Your, Our Daily Planet Newspaper/Magazine
Address	P.O. Box 543 Annapolis, MD 21404
Contact	Micha Dannenberg
Telephone	(301) 263-8184
Funded By	Advertising & Donations
Cost	$1,200 per issue
Congressional District	IV
Compilation Date	February 1980

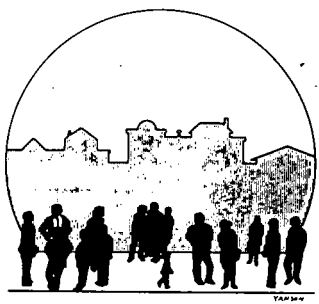
Concerned about the lack of local information on holistic living, three citizens of Annapolis, Maryland, decided four years ago to start a newspaper. The name chosen, The Your, Our Daily Planet, indicated the interests of the founders and the type of information contained in the paper.

Coming from a background in holistic health, the arts, community development, and natural foods, the founders and new staff members present their readers with information on such topics as preventive medicine, organic farming methods, alternative energy, and food co-ops. In addition, the paper portrays interesting local people and their achievements and keeps the readerhip up-to-date on local events, courses, and other happenings. The paper concentrates on aspects of everyday living, not spectacular events.

Copies of the paper are distributed primarily in central Anne Arundel County and are available in bicycle shops, libraries, natural food stores, stores selling wood-burning stoves, bars catering to the local people, and similar places. The method of distribution reflects the nature of the readership--citizens concerned and active in local affairs.

In the places where it is distributed, the newspaper is free to the public. Subscriptions are also available at a cost for $4 for eight issues. The paper is supported by the advertisers, many of whom are typical of the stores and establishments where the paper is distributed. The current advertising charge is $7.50 for a 1 x 3 inch space.

The total cost for producing each issue is about $1200. Approximately $600 is for printing with the remainder going for typing, layout, boards, tapes, letters and other proudction items.



Renewable Resources—A National Catalog of Model Projects

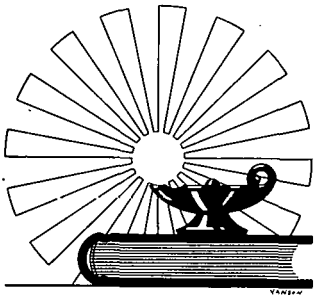
Category	Education
State	MD
Project Name	Appropriate Technology Student Research Projects
Organization	Mechanical Engineering Dept., Univ. of Maryland
Address	College Park, MD 20742
Contact	Dr. Patrick Cuniff
Telephone	(301) 484-2410
Funded By	Students
Cost	$60-$70
Congressional District	V
Compilation Date	February 1980

Groups of senior students in the Mechanical Engineering Systems Design course at the University of Maryland are designing and building appropriate technology projects with potential for use in the U.S. and in the developing world. The students use ideas and suggestions from a variety of sources such as VITA (Volunteers in Technical Assistance), and organizations providing technical assistance to groups in developing countries. They then design equipment meeting certain criteria, including applications that are made exclusively of local materials, simple to use and maintain and durable. They are also intent on making sure the devices use only readily available energy sources, including human power.

Projects designed by the students include a solar-powered bakery oven, a convection grain dryer, a laundry, a low-cost bakery dough-mixing machine, a brick-making machine, a waste-oil oven, an oilseed press, and devices for heating with wind power.

At the end of each semester, a seminar is presented in which the students demonstrate their designs and working models. The seminar is open to the public and the results of each project are published in a booklet available from Dr. Patrick Cuniff, the Department Chairman.

These student projects have some major advantages over ones developed by many small anizations and individuals. They have nical and financial support, and in many cases the students are able to conduct field tests on full-scale working models.



Renewable Resources—A National Catalog of Model Projects

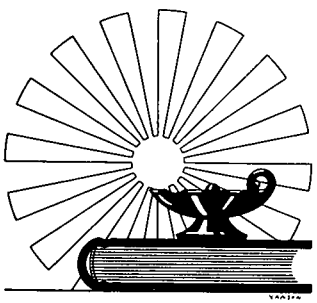
Category	Education
State	MD
Project Name	Community College Appropriate Technology Program
Organization	Anne Arundel Community College
Address	Arnold, MD 21012
Contact	Ted Suman
Telephone	(301) 647-7100
Funded By	State and County, Tuition
Cost	$17/person/course, average
Congressional District	IV
Compilation Date	February 1980

Entering its fifth year of operation, the Appropriate Technology Program at Anne Arundel Community College is unique among Maryland's community colleges. The basic purpose of the program is to help people reduce their cost of living, particularly the costs of food and energy. The emphasis has been on the "do-it-yourselfer" living in the suburbs, where many of the people of Anne Arundel County live.

The program originally started with a series of self-sufficiency lectures dealing with a variety of topics suggested by people from the community and college faculty. Since then, the program has evolved to include a wide range of activities. The back bone of the program is now a series of five-week, non-credit courses offered once a week through the college's continuing education division. Supporting activities include field trips, forays for edible wild plants and visits to alternative energy organizations; a periodic newsletter, "Options Toward Economic Living," featuring "how to" articles and other information provided by people in the community and on the college faculty; and an annual tent exhibit at the Anne Arundel County Fair, which provides a means of displaying alternative energy technologies, food equipment, and techniques.

The energy-related topics of the program have emphasized solar systems, wind power, methane gas, wood, heat pumps, and hybrid systems. Hydroponics, aquaculture, organic gardening techniques, and natural foods are among the food-related subjects. Other special courses have dealt with holistic health, the psychology of self-sufficiency, alternative waste-disposal systems, alternative housing, and intentional communities and bee keeping.

Approximately 1000 people from Anne Arundel County and other neighboring counties have been involved with the program in the four years since



its inception. They have included people of both sexes and all ages, and their occupations have ranged from judges, medical doctors, engineers, and secretaries to people homesteading full-time. Many of these have also served as instructors of the courses and leaders on field trips.

The near-term future of the program will include more "hands on" activities. A solar systems course completed in the spring semester of 1979 resulted in the construction of five working models of different solar systems. The systems, later installed in the Science Center building on the campus, included a trombe wall, a thermosiphon hot water system, a passive hot-air window unit, a hot-air collector with rock-bin storage, and an active hot water system. As a result of this course, twice as many people have signed up for an equivalent course being offered in the fall semester of 1979.

The Appropriate Technology Program at Anne Arundel Community College has demonstrated that there is a tremendous public interest in alternative energy, food, health, and other projects that focus on increased self-sufficiency. The community colleges are in a unique position to satisfy this need because of their stability, facilities, and equipment.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MD
Project Name	Heathcote Center, School of Living
Organization	Heathcote Center, School of Living
Address	RD 1, Box 129 Freeland, MD 21053
Contact	
Telephone	(301) 329-6041
Funded By	Tuition, Donations
Cost	
Congressional District	I
Compilation Date	February 1980

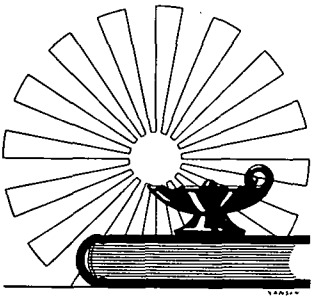
The Heathcote Center, located north of Baltimore near the Maryland-Pennsylvania border, is the the School of Living's first site and is one of four campuses the school currently operates. Founded in 1934 by Ralph Borsodi and incorporated as a non-profit institution in Ohio by Mildred Loomis in 1954, the School for many years has been a major force in the decentralist and rural revival movements.

In addition to promoting the School's goals, Heathcote has its own philosophy, which it expresses thus: "We are an educational facility for the School of Living, which is a movement for decentralism and rural revival. We're concerned with both the how and why of getting back to the land in America. Organic gardening is practiced and taught at Heathcote, along with low-cost building methods, alternative energy applications, etc."

"At the same time we are a social change agency where decentralist alternatives to mass society receive theoretical and practical attention. The community land trust concept, an approach to land tenure that doesn't treat land as property, is a major focus in our organizing work."

"Heathcote serves as a conference and workshop center hosting a number of gatherings each year on both the homestead way of life and the socio-economic implications of decentralism. We take on a limited number of activist students interested in learning by doing. Our winter facilities are still relatively limited. We're more equipped for real hospitality in the summer months."

The Center's 35 acres include about 30 acres of mainly hardwood trees and a tributary of Bee Tree Run stream. The property includes part of a north-south oriented valley floor and the eastern slope of an adjacent hill.



The main building, a 160 year-old former grist mill, houses the community kitchen, meeting rooms, laundry facilities, and a food co-op store that serves 25 to 30 people. Seven adults and two children currently reside in five outbuildings, which have been remodeled into living quarters. About two acres of the Center's plot is dedicted to organic gardens. Most members are vegetarians, although some goats and chickens are kept for milk and eggs. There are fruit trees on the grounds and bees are kept for both pollination and honey. Overall, the Center is about 30 percent self-sufficient in food with the rest either purchased or bartered from outside.

Heating of the buildings is primarily with wood. Some wastes are composted, burnables are used in the stoves, and tins and bottles are taken to recycling centers. Solar is used on a few buildings that have good southern exposure.

Heathcote was purchased in the mid-sixties with funds donated by members of the School. Based on the land-trust concept, the lease from the School specifies that the land cannot be destroyed or sold. At least 20 days of conference must be held per year and there must be at least three adults living on the property at all times. If there are fewer than three, the School has the right to re-populate Heathcote. With prior agreement from the School, the Heathcote property could be sold and a new center established elsewhere if urban encroachment or other phenomena keep Heathcote Center from carrying out the goals of the School.

The by-laws of Heathcote specify that no more than shall live on the property. Governed by consensus, the group has no single leader. Live-in members are required to put in about 20 hours per week to maintain the campus. Meals shared and responsibilities are rotated. Some members have outside jobs, which provides some of the funds to operate Heathcote. Other money comes from the conferences held on campus. Those who want to join the community at Heathcote must agree to the by-laws and to live at the Center on a trial basis for six months.

Based on a holistic approach to life, Heathcote has so far sponsored about 100 conferences and retreats. These have ranged from one day to several weeks in duration and have enrolled from fewer than 10 to over 30 persons each. Topics have included natural foods, nutrition and other health-related subjects, shelter designs, education, and alternative energy (including solar, wood and hydropower).

The tuition for the conferences varies but is generally minimal. The money received primarily covers just the operational costs (food, electricity, etc.) of Heathcote for running the programs. Instructors often donate their time. For persons unable to afford tuition, a limited number of fellowships are available. In some cases, the conference expenses can be offset by students helping with conference activities and logistics, such as food preparation, etc.

Many of the conferences have resulted in the construction and operation of projects on campus. Examples include a grow-hole greenhouse, two small solar greenhouses that provide heat for one of the houses, and two passive solar walls on another house.

Center members are seriously considering developing cottage industries that would help provide income to Heathcote, as well as function as an integral part of its overall educational program. Two members are presently making massage tables. Other possible projects include a woodworking shop for crafts and furniture refinishing, and tree- and shrub-pruning service in the neighboring community.

In addition to cash-flow problems, which a cottage industry can help solve, the Center has two other major problems. At present, it has no reliable means of following up on the conferences to determine whether participants are utilizing what they learned. The other problem is the turnover of live-in members: a two-year commitment on the part of live-in members seems to be the minimum if the Center is to benefit from the experience and skills gained during a member's stay.

Renewable Resources—A National Catalog of Model Projects

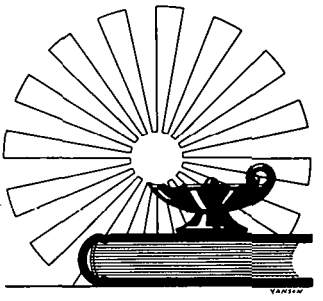
Category	Education
State	MD
Project Name	Wind-generated Ice Machine

The poultry industry on the Delmarva Peninsula (the Eastern Shore parts of Delaware, Maryland and Virginia) is studying the possibility of using wind generated electricity for ice-making. Large quantities of ice are required for storing and transporting poultry products, and making this ice takes a considerable amount of the industry's total electricity consumption.

Ice-making can be done 24 hours a day and would be a good use for the fluctuating operation of windmills.

Except for certain restricted areas such as mountain passes in the western part of the state, the potential for wind power appears to be greatest on the Delmarva Peninsula due to its relative flatness and proximity to coastal winds from the Chesapeake Bay and Atlantic Ocean.

Organization	Foundation for Self-Sufficiency
Address	35 Maple Avenue Catonsville, MD 21228
Contact	Greg Welsh
Telephone	(202) 223-6336 (301) 972-3678
Funded By	Membership Dues, donations and grants
Cost	$12/year (dues)
Congressional District	VI
Compilation Date	February 1980



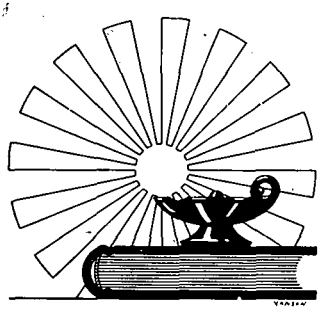
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MD
Project Name	Wind Power Research

Wind power as an alternative energy source is not yet highly developed in Maryland. An estimated 400 of the older water pumping Aeromotor windmills still stand in the state, and some are used for pumping. Beyond that, there are only a few commerically manufactured windmills used by individuals throughout the state for small-scale electricity generation.

The Foundation for Self-Sufficiency (35 Maple Ave., Catonsville, Maryland, 21228, 301-744-4291) has experimented with different blade designs for water pumping windmills.

Organization	Foundation for Self-Sufficiency
Address	35 Maple Avenue Catonsville, MD 21220
Contact	Greg Welsh
Telephone	(202) 223-6336 (301) 972-3678
Funded By	Membership Dues, donations, and grants
Cost	$12/year (dues)
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	MD
Project Name	County Solar Tax Credit (Anne Arandel)

Organization	Anne Arundel County Council
Address	Maryland Arundel Cen. Annapolis, MD 21404
Contact	Councilwoman Virginia Clagett
Telephone	(301) 224-1401

Funded By	County Government
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

Anne Arundel County in Maryland is the second county to enact a tax credit bill for solar systems. (Harford County was the first.) The bill (No. 108-79) was introduced by Councilwoman Virginia Clagett, amended and passed by the full Council, and approved and enacted October 23 of 1979 by the County Executive.

The tax credit covers all of the necessary equipment, installation, and/or construction costs for solar heating or cooling units on residential buildings or structures beginning in the 1981 fiscal year. The law will terminate automatically on June 30 of 1981, providing there is no further action by the County Council. The credit applies only to the real property taxes levied on buildings or structures. It does not apply to taxes on land.

The total tax credit allowed will be the lesser amount of either the total costs of materials and installation or construction of the solar energy units, or the total amount of the real property taxes levied against the buildings or structures.

The bill represents a step forward for Anne Arundel County but is relatively weak compared to the original bill submitted by Councilwoman Clagett and to the Harford County solar tax credit. Tax credits for commercial buildings were eliminated and the original three-year period for qualifying for tax credits was reduced to one year.

On the other hand, an amendment stating "all amounts received from federal or state tax credits, grants or any other source shall be deducted from the total tax credit allowed" was stricken from the final bill.

Since the bill does not become effective until fiscal year 1981, it is not known how many people will take advantage of the credit or how much money they will be saving because of the measure.

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	MD
Project Name	County Solar Tax Credit (Harford)
Organization	Harford County, MD
Address	45 South Main Street Bel Air, MD 21014
Contact	William O. Whiteford
Telephone	(301) 838-6000 (301) 879-2000
Funded By	County Government
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Harford County, Maryland, was awarded a plaque and national recognition by the National Association of Counties in 1979 for passing the first bill in Maryland providing tax credits for the installation of solar heating and cooling units.

The bill (Harford County Bill No. 77-32), which became effective on July 22 of 1977, provides tax credits from Harford County real property taxes levied on residential buildings, non-residential buildings, and other structures that use solar energy for space-heating or cooling. The bill does contain one caveat: no credit is provided for taxes on land.

The Harford County tax credit is particularly significant because of the potential size of the credits available to citizens. The taxpayer is allowed to take the lesser amount of either the full cost of materials and installation or construction of the units, or the total amount of the real property taxes levied against the buildings or structures for a consecutive three year-period following the approval of the tax credit application. Thus, it is possible for taxpayers to take a 100 percent tax credit and regain their entire original investment in the solar system.

The types of solar units eligible for the credit include both homemade and commercially manufactured systems, and passive as well as active solar devices. To obtain the credit, taxpayers must have receipts for all equipment and parts. Electrical and plumbing permits are also required, and electricians must complete the final hook-up of the system.

The amount of money citizens are currently saving averages about $600 per application per year. The total tax credit is much higher for an individual, however, since the bill allows credit for the taxes levied for the sum of three consecutive years.

To date, 465 Harford County citizens have taken advantage of the bill. Five people used the credit during the first year, 60 during the second year. In all, 400 applications were received in 1979. result, the county has lost $4,000 in revenue the first year, $40,000 in the second year and has the potential to lose $320,000 for 1979.

The citizens and County Government are generally pleased with the results of their solar initiative. However, several concerns have developed. Because of the reduction in County tax revenue, the availability of federal solar tax credits and grants, and the possible passage of a state solar tax credit bill in 1980, the County is studying the possibility of pro-rating the County tax credit to something less than its present 100 percent level. The County faces another problem in determining the efficiency of particular solar systems to see if they qualify for the tax credit, especially since it has broadly defined and interpreted solar systems to include passive, active, homemade and commercial. One final difficulty concerns the absence of an expiration date in the bill. Some County Council members have become concerned about the long-term effect of reducing the tax revenue.

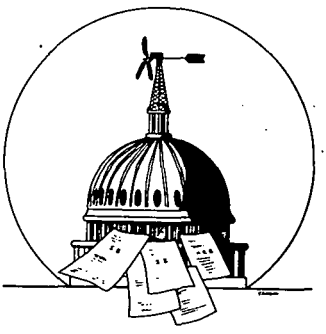
Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	MD
Project Name	1980 Maryland Solar and Conservation Legislation
Organization	Maryland General Assembly
Address	State House Annapolis, MD 21401
Contact	Delegate Gerald W. Winegrad
Telephone	(301) 269-6200
Funded By	If passed, by state government funds
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

During the 1980 session of the Maryland General Assembly, legislators will have the opportunity for the first time to consider a large number of timely and important solar and energy-conservation bills. A package of ten proposed legislative bills and four administrative proposals has been developed by Delegate Gerald W. Winegrad, a freshman legislator from Anne Arundel County, Maryland, and submitted for consideration to the appropriate state legislative committees.

The ten legislative measures that have been proposed cover a wide range of issues: state income tax credits and sales tax exemptions for solar and energy-conservation installations; a tax credit for builders of passive solar structures; a sun rights measure; mandatory deposit legislation for beverage containers; a requirement that the state install renewable energy systems in all state-owned buildings if justified by life-cycle costing; a measure mandating utilities to conduct energy audits on residential buildings when asked to do so and limiting the cost to ten dollars; a requirement that EPA mileage estimates be posted in all car ads; and a bill establishing the Maryland Energy Conservation Fund.

New solar and conservation administrative proposals suggested by Del. Winegrad include those for establishing a state lending policy, reviewing building codes with the aim of upgrading insulation standards, implementing county solar property tax credits, and mandating state passenger fleet fuel-economy standards.



Of the legislative measures proposed, the bill that would establish the Maryland gy Conservation Fund is particularly worthy. Financed by increasing annual mobile registration fees (which are weight-gauged) funding would be distributed into a number of important energy programs. At least 10 percent of the funds would go toward mass transit and alternative transportation systems. Another 10 percent or more would be channelled into low-interest solar/conservation loans for low- and moderate-income homeowners. Demonstration programs that focus on innovative means of generating and conserving energy would get at least another 5 percent, and construction grants for solid-waste energy-conversion facilities would get no less than 10 percent of the fund. A minimum of 1 percent of the revenues would go into an information program to promote solar energy use and conservation, while no more than 10 percent of the fund could go toward grants to low-income individuals unable to pay their heating bills.

Three bills provide income-tax credits for installing energy-conservation devices and solar systems in buildings. The first tax credit applies to residential, owner-occupied buildings. Homeowners would receive a tax credit of up to 30 percent for the first $2,000 invested and 20 percent for the next $8,000 invested in solar devices; they would also be eligible for a 15 percent credit of up to $2,000 invested in energy-conservation measures for their home.

Another bill proposes to give owners xisting commercial and rental property tax credits for installing energy-conservation devices (15 percent) and solar systems (30 percent). Builders of passive solar structures could also receive a 30 percent tax credit for installing solar systems in these buildings.

In Del. Winegrad's bill requiring utilities to conduct energy audits for homeowners on request, the costs of these audits would be added to the general rate-making base rather than be charged to the individual homeowner.

Still another interesting measure calls for the installation of renewable energy systems on all state buildings if the life-cycle cost of the solar system does not exceed by more than 5 percent the cost of a comparable conventional system.

Del. Winegrad has also suggested that 4.2 trillion Btus could be saved in one year if a mandatory deposit law for all beverage containers were passed. In the interest of energy conservation and the environment, he has introduced such legislation this year.

One proposed administrative measure is geared toward establishing a solar/conservation lending policy. It calls for the Governor and other state officials to meet with banks, saving and loan associations, credit unions, and loan companies to develop a lending policy that would encourage the implementation of renewable energy and conservation systems. As an example of this type of action in other states, Del. Winegrad points to Massachusetts, where 115 financial institutions have agreed to provide solar/conservation loans at one to two percent below the current interest rates.

Another administrative proposal mandates that the state passenger fleet follow fuel economy standards of 20 mpg. for 1981, 22 mpg. for 1982, and 25 mpg. for 1983.

During the spring of 1980, the public will have an opportunity to voice its opinions and concerns about the administrative and legislative proposals being offered by Del. Winegrad. Each committee charged with considering one of the measures will be holding open hearings.

Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	MD
Project Name	Solar Still for Alcohol Production

Organization	St. Mary's County, MD
Address	St. Mary's County Government Center Box 351 Wintertown, MD 20650
Contact	Dan Dawson
Telephone	(301) 475-5621 Ext. 490

Funded By	County Government Funds
Cost	$110
Congressional District	I
Compilation Date	February 1980

The gasoline shortage in the spring of 1979 was especially severe in Southern Maryland. This encouraged the county commissioners of St. Mary's County to begin a county-wide effort to look into the possibilities of producing alcohol fuel locally. At the same time, three recent graduates from a county high school were experimenting with alcohol production using a solar still. The end result was that the county hired the students for the summer and gave them a grant to build an experimental solar still for demonstration purposes at the Leonard Hall Government Center in Leonardtown, Maryland.

The students, Dan Dawson, Bill Lindsley and Henry Leskinen, initially used standard mashes and techniques for the alcohol production. But the distillation process was unique.

Strained mash was placed in a large plastic garbage can on top of a wooden tower about eight feet high. The mixture then ran by gravity flow into a small preheater solar collector that was placed nearly horizontal on top of the main solar collector-distiller. From there, the mash ran through a feeder pipe at the top of the distiller and then slowly down to the bottom. The distiller (approximately 7 x 3 feet in size) had side-boards with reflective surfaces that concentrated sunlight and reflected it into the distiller. The distiller has strips
ırlap running horizontally across the metal
ng collecting surface at three-to four-
ınch intervals. These strips slowed the rate of the mash's flow and allowed the temperature to rise high enough to evaporate the alcohol out of the mash. The alcohol re-condensed on the inside of the glass cover and ran down to a bottle at the bottom of the distiller. The rest of the liquid mash was collected at the bottom in a separate container for further distillation. The students have been able to produce alcohol as high as 130 proof on the first run through the distiller.

In a related project, the students modified the carburetor of a pick-up truck so they could run it on pure alcohol. Although there was some difficulty in starting the engine, they were able to operate it on as low as 130 proof alcohol.

Utilizing salvaged materials, the students built their still for under $100. Using a simple design, they were able to build a prototype still that undoubtedly will be replicated by others in the county. Now they are experimenting with a variety of other grains and fruits for the mash, looking into more efficient ways to heat the mash, and making modifications on the solar still.

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	MD
Project Name	Demonstration Solar Retrofit Project

As a first step in trying to demonstrate the viability of solar heating for low-income housing, the Garrett County Community Action Committee has constructed and installed a number of solar heating units on low-income homes in the county. According to the individual needs of each house, one or more types of solar systems were retrofitted on each building. Houses received combinations of solar greenhouses, insulated shutters, window box heaters, solar collectors, rock storage systems, solar window walls, and oil-drum storage walls.

The county plans to monitor the effectiveness of at least two of the buildings. Concurrently, staff members from the National Center for Appropriate Technology will evaluate the project and secure data on the solar demonstration homes. The evaluation will be used in part to determine the practicality of creating a cottage industry to manufacture solar heating systems.

Organization	Garrett County Community Action Committee, Inc.
Address	P.O. Box 149 Oakland, MD 21550
Contact	Marcus Oliver
Telephone	(301) 334-9431

Funded By	National Center for Appropriate Technology (NCAT)
Cost	$9,962
Congressional District	VI
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	MD
Project Name	Bay Alliance for Safe Energy

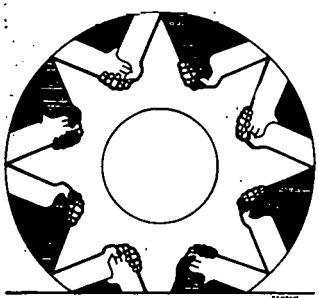
Located primarily in Anne Arundel County in Maryland, a group of approximately 20 to 25 concerned citizens have formed an organization called the Bay Alliance for Safe Energy.

Organized after the Three Mile Island Nuclear Power Plant accident, the Alliance has taken the position that alternatives to nuclear energy must be implemented.

Members of the Alliance currently meet weekly and general meetings for the public are held monthly. The public meetings feature experts knowledgeable on the detrimental aspects of nuclear power.

The Bay Alliance for Safe Energy is involved in a number of other activities, including networking with other groups, establishing an information "phone tree," lobbying on legislative measures, and publicizing nuclear power issues.

Organization	Bay Alliance f Safe Energy
Address	500 Mayo Road Glen Burnie, MD 21061
Contact	Rosemary and Tom Teets
Telephone	(301) 761-6733
Funded By	Donations, Dues
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	MD
Project Name	Foundation for Self-Sufficiency

The Foundation for Self Sufficiency, incorporated in 1975, is the oldest non-profit organization in Maryland engaged in both research and education in small-scale food- and energy-production. Supported primarily by membership dues, the Foundation's work exemplifies what can be done on a small budget.

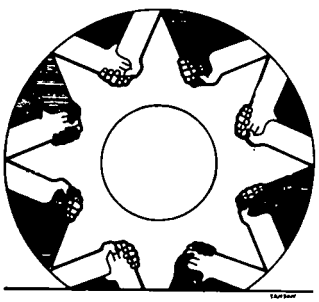
The Foundation's philosophy is based on a concern with preserving the environmental quality of our natural "life support" systems. The group's major focus is on developing and sharing simple low-technology methods of food- and energy-production suitable for the backyard and the neighborhood.

The present membership of approximately 100 represents a cross-section of professional backgrounds and lifestyles. The common denominators are a belief in what the Foundation is doing and the willingness to build and use the equipment and techniques developed by Foundation members.

Foundation research centers primarily around its physical facilities in Catonsville. Those facilities include two different-sized solar-heated dome greenhouses, the larger of which features a water tank for raising Tilapia fish. Two windmills of different designs (one a sail-wing variety using cloth blades, the other a vertical-axis type, Hinge-vein) are used as part of an integrated system to circulate water f)ther fish ponds through hydroponic plant-g ıg beds and back to the fish ponds. Examples o. ouier projects include a "bike-barrow" for ease in moving small equipment around a yard, and simple-design equipment for continuous temperature monitoring.

Publications of the Foundation include newsletters and two books - Essays on Food and Energy and Renewable Energy Alternatives in Maryland. Publishing costs of both books, which have been widely distributed throughout the state, have been partially met by federal and state grants.

Organization	Foundation for Self-Sufficiency
Address	35 Maple Ave. Catonsville, MD 21228
Contact	Greg Welsh
Telephone	(202) 223-6336 (301) 972-3678
Funded By	Membership, Donations, Grants
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Several articles have also been reprinted in national publications.

Other activities of the Foundation include participating in fairs, giving speeches to a variety of organizations, offering courses at several community colleges, and developing working relationships with other organizations. Through a state grant, the Foundation has also produced a solar energy slide show for elementary public schools in Maryland.

Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	MD
Project Name	MidAtlantic Solar Association
Organization	MidAtlantic Solar Association
Address	n/a
Contact	George W. Clayton
Telephone	(301) 460-5797 (301) 589-1321
Funded By	Membership Dues
Cost	$50 per Company
Congressional District	State-wide
Compilation Date	February 1980

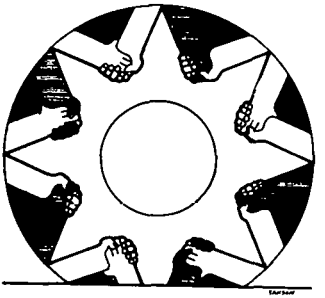
Following a series of informal meetings in 1979, a group of solar contractors in Maryland formed the MidAtlantic Solar Association. The Association is open to anyone interested in alternative energy but is primarily intended to be a trade association for dealers, installers, and other professionals in the solar field.

Its goals include educating the public on solar energy; supporting appropriate legislation and regulations at the federal, state, and local levels; promoting and maintaining high standards of business ethics, materials quality, workmanship, manufacturing, and maintenance of solar energy systems; networking with other groups promoting solar energy development and use; developing a data bank of solar information useful to the trade and the public; and publishing newsletters.

Since its first official meeting on August 1, 1979, the Association has held monthly meetings to further its goals. Representatives from about 50 companies now belong, 30 of them being the most active. A fee of $50 per company provides the financial support.

Most Association efforts to date have been directed toward helping develop new BOCA (Building Officials Conference of America) codes involving alternative energy systems and new Maryland legislation. It has hired a part-time lobbyist to help the members know what energy bills are pending in the 1980 Maryland General Assembly and what their probable effect will be on the trade. As a result, members have been able to testify before committees and to pursue other forms of persuasion, such as letter writing, etc.

Critique/analysis: While the members of the Association are generally pleased with their progress, there have been problems. Chief among them are a shortage of staff to handle daily business and a shortage of money to support Association affairs, particularly the legislative lobbying effort.



Renewable Resources— A National Catalog of Model Projects

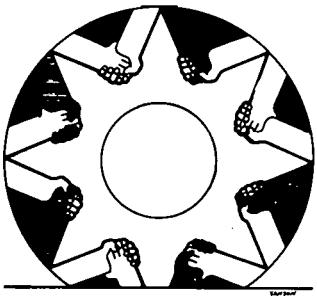
Category	Outreach
State	MD
Project Name	Student Alternative Energy Organization

The Solar Society of Towson State University, located in the northern suburbs of Baltimore, is an active citizen group of approximatly twenty university students, faculty members, and local citizens. For the past two years, the Society has sponsored seminars, lectures, field trips, research on alternative energy systems, and two very successful Sun Day fairs on the campus. Members have also built a solar food dehydrator for a natural food store and a "heat-grabber" solar space-heating unit.

The Society also works closely with other alternative energy groups in Maryland, and it is helping a number of colleges to set up their own solar organizations. Several of the members have also been very active in the Baltimore Energy Co-op, an alternative energy supply store.

Under the sponsorship of Dr. David Greene and university students David Wentling, Dan Lopez and Jim Lytle, the Society meets every two weeks on the Towson campus during the academic year.

Organization	Solar Society of Towson State Univ.
Address	Towson State Univ. Towson, MD 21204
Contact	David Greene
Telephone	(301) 321-3003
Funded By	Donations
Cost	n/a
Congressional District	II
Compilation Date	February 1980



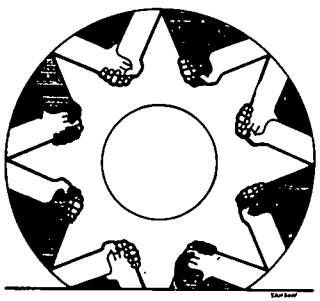
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	MD
Project Name	People for Self-Sufficiency

People for Self-Sufficiency is a recently formed citizen organization in Southern Maryland that is focusing primarily on problems facing rural, low-income families in the tri-county area of Calvert, Charles, and St. Marys Counties. At present, the group is composed of volunteers representing local government agencies, non-profit organizations, shared-purpose communities, and private citizens.

The initial functions of the organization include technical assistance, demonstration projects and research aimed at self-help projects, including assistance to people in weatherizing their homes and using renewable energy sources for heating. The group will also publish a newsletter providing "how to" information including lists of sources of funding for local projects. Future activities will provide more direct assistance to families, and the group plans to expand the range of services it offers. Getting more information to families on nutrition and preventative health will be key to that expansion.

Organization	People for Self-Sufficiency
Address	Route 3, Box 98 Woodburn Hill Rd. Mechanicsville, MD 20659
Contact	Gaines Steer
Telephone	(301) 884-5615
Funded By	Donations
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	MD
Project Name	Easton Utilities Commission
Organization	Easton Utilities Commission
Address	N. Washington St. Easton, MD 21601
Contact	William Corkran
Telephone	(301) 822-1600
Funded By	Utility, DOE
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The Easton electric generating plant, the second oldest municipal plant in the country, has recently installed an experimental waste-heat recovery system on its two new diesel-engine generators in the plant's new building in the town's airport industrial park. The system utilizes the waste heat from the diesel engines' exhaust to run a small electric generator.

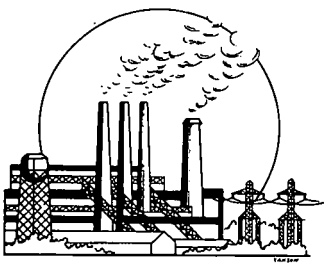
The waste heat recovery system, manufactured by Sundstrand Energy Systems of Rockford, Illinois, relies on a Rankine-cycle engine. The waste heat from the diesel engines vaporizes an organic fluid, Toluene, which in turn operates a turbine-powered electric generator. The Toluene is then cooled by water and recycled in its liquid state to be re-vaporized by the exhaust heat from the engines. The cooling water is also recycled through a separate cooling unit.

The electricity produced by the waste heat recovery system amounts to about 600 kilowatts, and represents approximately 10 percent of the 6,250 kilowatts produced by the main generator on each diesel engine.

The system has been financed primarily by a Department of Energy grant.

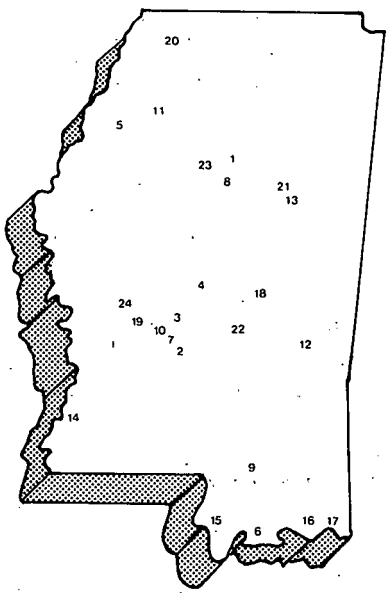
When these units are mass produced, it is estimated that the pay-back time will be approximately 10 years.

Critique/analysis: The experimental system at the Easton plant is the second unit of its type now operating in this country. First turned on in March of 1979, the system has performed up to expectations. The major problems to date have been electrical, primarily involving the computer control system. These problems are viewed as typical of the start-up difficulties that attend the introduction of any new system.



MISSISSIPPI

1. Bellefontaine
2. Brandon
3. Canton
4. Carthage
5. Clarksdale
6. Gulfport
7. Jackson
8. Kilmichael
9. Lumberton
10. Madison
11. Marks
12. Meridian
13. Mississippi State
14. Natchez
15. NSTL Station
16. Ocean Springs
17. Pascagoula
18. Philadelphia
19. Pocahontas
20. Sentatobia
21. Starkville
22. Walnut Grove
23. Winona
24. Yazoo City



MISSISSIPPI

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Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	MS
Project Name	Solar-heated Broiler House

A 30' x 48' poultry broiler house for 1,600 chickens at Mississippi State University is solar heated.

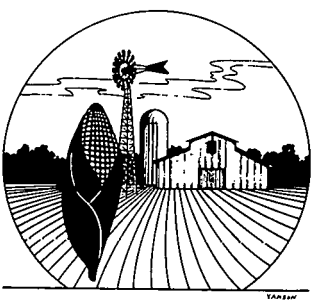
The solar system consists of air-type collectors in the wall of the building.

During a test period from January through March of 1979, the system met 50 percent of the building's heating needs. Back-up heat is provided by propane.

Critique/analysis: Minor air leaks were found initially, and the experiment is not yet cost-effective. However, the owner still considers it a success.

Organization	Mississippi State University
Address	Drawer M E Mississippi State, MS 39762
Contact	Dr. Richard Forbes
Telephone	(601) 325-6161

Funded By	DOE
Cost	$39,000
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

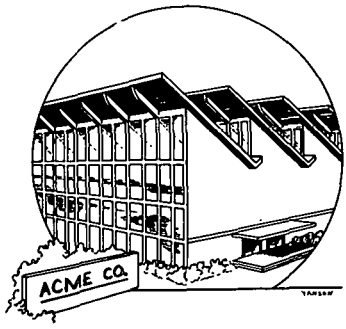
Category	Commercial
State	MS
Project Name	Brewer, Godbold and Associates, Ltd.

Brewer, Godbold and Associates, Ltd., an architectural firm, has located its offices in a 3,468 ft^2 solar building. Sixty-five percent of the building's heating requirements are met by 507 square feet of air-type collectors. The rock-box storage is adjacent to the structure.

Natural gas provides back-up. Cooling is by conventional means.

Critique/analysis: No problems have been experienced to date.

Organization	Brewer, Godbold and Associates, Ltd.
Address	P.O. Box 458 Clarksdale, MS 38614
Contact	Sam Godbold
Telephone	(601) 624-8531
Funded By	Private
Cost	$20,600
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

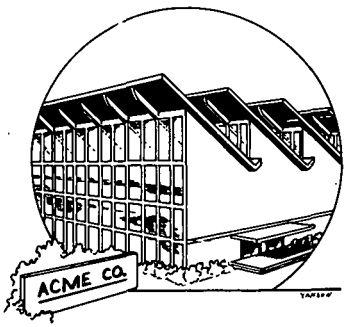
Category	Commercial
State	MS
Project Name	Security State Bank
Organization	Security State Bank
Address	Highway 12 at Spring Street Starkville, MS 39759
Contact	Doug Herring Bascom Allen
Telephone	(601) 323-5155
Funded By	DOE grant (66 percent)
Cost	$16,078
Congressional District	II
Compilation Date	February 1980

The Security State Bank in Starkville has 312 square feet of air-type solar collectors. They are expected to supply approximately 60 percent of the space-heating requirements for this 788 ft^2 bank building.

Rock storage is incorporated in the center post of the building.

The building is cooled conventionally, and back-up heat is electric resistance heating.

The main components of the system have life expectancy of sixty years.



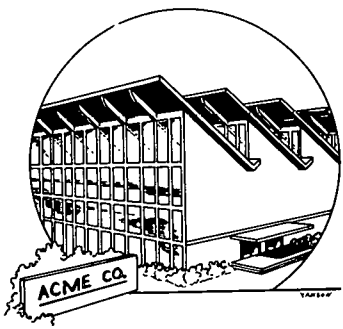
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	MS
Project Name	Waste-heat Recovery

A heat-reclamation system in a Delchamp's building uses a heat exchanger to extract waste heat from refrigeration compressors. The heat is then used for space heating and dehumidification. Between 40 - 50 percent of the total heating requirements of the building are met by this system.

Critique/analysis: The system performs so well that the company is installing it in every new store it builds.

Organization	Delchamps
Address	3617 Denny Avenue Pascagoula, MS 39203
Contact	A. B. Bartoli
Telephone	(205) 433-0431
Funded By	Delchamps
Cost	Classified
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	MS
Project Name	Waste-heat Recovery for Laundry

The Meridian Holiday Inn Northeast, has a heat-recovery system in the laundry room. The system uses the waste heat from the dryer exhaust to heat water for the washing machines. Approximately 155 gallons/hour of 140 degrees water is supplied.

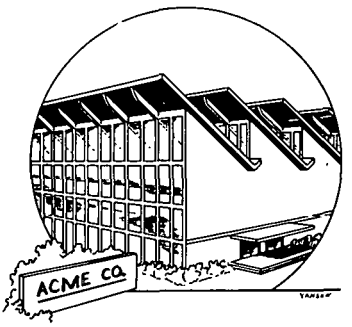
The system is expected to have a 30-month payback.

The Holiday Inn South has the same system in its laundry. However, it also has on the air conditioner exhaust a heat-recovery system that supplies an extra 5 gallons/hour of 140 degrees water for use in the kitchen and bar. The back-up for both systems is natural gas.

Critique/analysis: The operation of one of the systems was delayed for a few weeks when a gasket blew, but all systems appear to be working well at present.

Organization	Mississippi Management Inc.
Address	P.O. Box 16807 Jackson, MS 39206
Contact	Ken O'Keefe
Telephone	(601) 982-7731

Funded By	Mississippi Management
Cost	Laundry System - $3,700; Commercial Bldg. - $1,800
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	MS
Project Name	Solar Dormitory

The Director and residents of Friends of Alcoholics have solarized one of the organization's dormitories. The system, made primarily from used parts, supplies solar hot water to a dormitory that houses 35 to 40 men.

The dorm consists of two 4' x 16' collectors constructed of wood, sheet steel, 3/4-inch plastic tubing, insulation and a double-glaze of plastic. The tank has a 500-gallon capacity.

The local utility is monitoring the system to obtain additional performance data, and the electricity bill has already been substantially reduced.

Critique/analysis: No problems are reported to date.

Organization	Friends of Alcoholics
Address	Pocahontas, MS 39072
Contact	Rev. Dick Barth
Telephone	(601) 362-4275
Funded By	Friends of Alcoholics
Cost	$300
Congressional District	IV
Compilation Date	February 1980

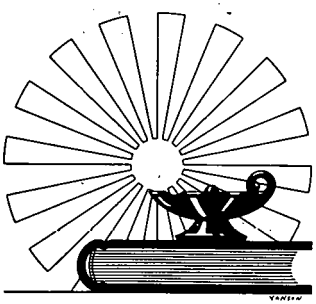
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Energy Audit Program

Mississippi State University sponsors a state-wide Energy Audit Program for elementary and secondary schools.

Recommendations are made to schools on how they may lower their energy costs by adopting energy-conservation methods.

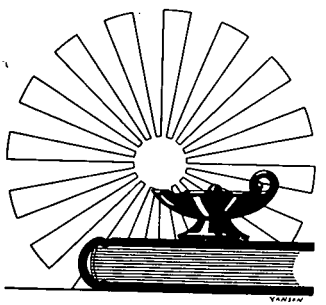
Organization	Mississippi State University
Address	Mechanical Engineering Department Mississippi State, MS 39762
Contact	B. K. Hodge
Telephone	(601) 325-4915
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Energy Conservation Workshop
Organization	Golden Triangle PDD
Address	Golden Triangle PDD Starkville, MS 39759
Contact	n/a
Telephone	(601) 325-3855
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The Tennessee Valley Authority and the Golden Triangle Planning and Development District (PDD) conducted an "Energy Conservation Workshop" to teach community leaders about energy-conservation measures.



Renewable Resources—A National Catalog of Model Projects

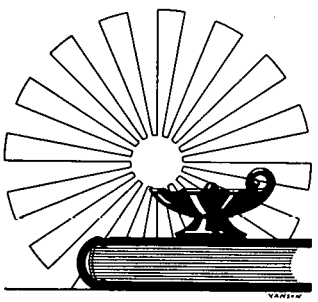
Category	Education
State	MS
Project Name	Energy Day Camp

The Yazoo County Energy Committee organized an Energy Day Camp, designed to teach teenagers to save energy via correct use of lights, water, and household appliances.

A model home was used to demonstrate how location and landscaping can help residents utilize solar heat in winter and to cope with it in summer.

Critique/analysis: The organizers concluded that the attendance was not sufficient to justify the expense, time, and effort.

Organization	Yazoo County Energy Committee
Address	c/o County Office Building Yazoo City, MS 39194
Contact	Ollie Jean Lane
Telephone	(601) 746-2453
Funded By	Businesses
Cost	$100
Congressional District	III
Compilation Date	February 1980

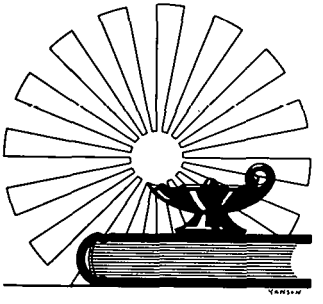


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Energy Symposium

Mississippi State University's Energy Research Center recently sponsored the Mississippi Energy Symposium -- a one-day meeting of energy researchers and the public. The purpose of the symposium was to inform people of the energy situation, as well as of research activities taking place in the state.

Organization	Mississippi State University
Address	MS Energy Research Center, College of Engineering Mississippi State, MS 39762
Contact	Dr. Ralph E. Powe
Telephone	(601) 325-2266
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980

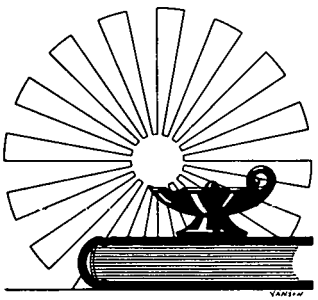


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Laurel Hill Learning Center
Organization	Laurel Hill Learning Center
Address	Rte. 3, Box 191-B Natchez, MS 39120
Contact	Pierce R. Butler
Telephone	(601) 445-9760
Funded By	Private
Cost	$10,000-12,000
Congressional District	IV
Compilation Date	February 1980

The Laurel Hill Learning Center is nearing its opening as a school of organic agriculture and appropriate technology. Presently, construction of a combination workshop and integral solar greenhouse with residential wood-burning water heater is under way.

Critique/analysis: Skilled faculty are being sought for building and growing projects.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Solar Fair

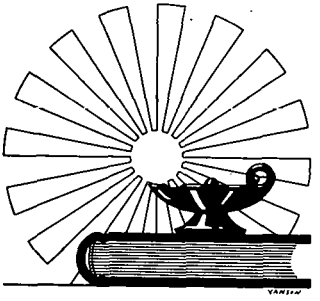
On September 29, 1979, the Gulf Coast Clean Energy Alliance sponsored a Solar Fair at the Edgewater Plaza Mall in Biloxi, MS. The purpose of the Fair was to educate the public about clean energy alternatives, and demonstrate easy, do-it-yourself solar projects.

There were out-of-doors demonstrations of solar food dryers, window box collectors, hot water collectors, a solar cooker, and a demonstration of solar tea-making. In addition, movies, slides, literature, and indoor displays were featured.

During the last week of September, Gulf Coast Libraries displayed solar books with posters advertising the Fair. All of the Coast's daily and weekly newspapers received press releases announcing the event, and flyers were given out at Coast high schools and to environmental organizations. In addition, two members of the Gulf Coast Clean Energy Alliance were interviewed the morning of September 26th on Channel 13's Good Morning, South Mississippi, program.

Organization	Gulf Coast Clean Energy Alliance
Address	c/o Ms. Ruth Slade Route 5, Box 385 Gulfport, MS 39503
Contact	Ms. Ruth Slade
Telephone	(601) 392-5599
Funded By	Yard sale and donations
Cost	n/a
Congressional District	V
Compilation Date	February 1980

Critique/analysis: The Fair was well-attended.



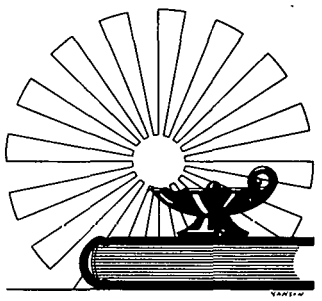
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Sun Studies

The STARS Planetarium has created a solar energy program that covers the physical nature and behavior of the sun and its potential energy resources. The complex system by which the sun, earth, and the earth's atmosphere and magnetic field interact to deliver energy to this planet are discussed in detail, as are methods of extracting usable energy from the sun.

The program has also been presented as a slide show outside the Planetarium. The same tape is used, and additional slides replace special effects used in the Planetarium.

Organization	STARS Planetarium
Address	Jackson County School District Rte. 2, Box 269 HH Ocean Springs, MS 39564
Contact	n/a
Telephone	(601) 826-5007
Funded By	Jackson County School District
Cost	$25 to $30 for presentation
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Cox Residence

David Cox and his family live in a passive, trapezoidal house (42 feet long on the south wall, 30 feet on the north), that is constructed of brick and styrofoam "sandwich" walls. One layer of brick forms the outside of the sandwich. Inside are an air space, one inch of styrofoam, another air space, and an inside layer of brick. Additional mass is provided by the 6-inch concrete slab overlaid with brick pavers and the large central chimney pillar, also constructed of brick.

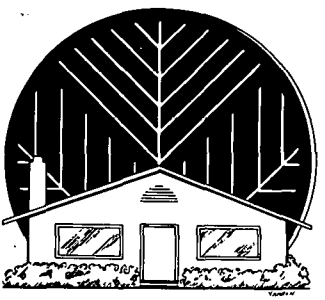
Most of the south face of the two-story house is made up of double sliding glass doors, which also open for ventilation. The interior of the house is designed to promote natural air convection, and ceiling fans aid air circulation.

Back-up is provided by a wood heater and a conventional electric heating and cooling system. Approximately two-thirds of the north wall of the house is closet and storage space, providing a buffer zone.

This house has been occupied since August of 1977, and the electric bill averages $54 per month.

Critique/analysis: No problems have been encountered to date. The owner is considering adding movable insulation on the south wall to further improve the performance of the house.

Organization	David Cox
Address	Mannsdale Road Madison, MS 39110
Contact	David Cox
Telephone	(601) 969-0181
Funded By	Private
Cost	$36,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

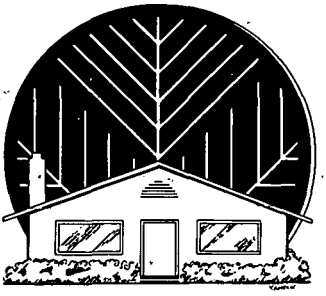
Category	Housing
State	MS
Project Name	Cypress Creek Condominiums

Two of a group of eight condominiums in Clarksdale are heated by 620 square feet of air-type collectors.

The system meets approximately 55 percent of the space-heating and water-heating requirements of the buildings. Storage is provided by rock beds, which are built into the carports. Back-up heat is provided by heat-pumps.

Critique/analysis: Initial air leaks in the duct system have been corrected.

Organization	Cypress Creek Condominiums
Address	Friars Point Road Clarksdale, MS 38614
Contact	Milton G. Johnson
Telephone	(601) 624-2556
Funded By	HUD grant (84 percent)
Cost	No. 1 - $11,980 No. 2 - $12,136
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

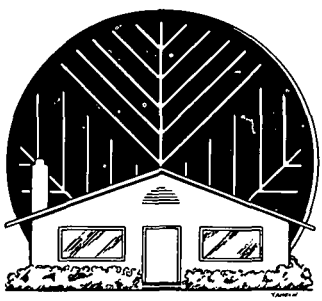
Category	Housing
State	MS
Project Name	Dan Pepper's A-Frame

Dan Pepper lives in a three-story 2,400 ft^2 passively heated A-frame.

Additional heat is supplied by a central circulating fireplace, a wood-burning heater, and an electric heater in the bathroom. Cooling is accomplished by natural convection, attic fan, and a reflective aluminum roof.

Critique/analysis: The owner is very happy with the home and considers his time an excellent investment. His only real problem was a lack of advice in purchasing tools and materials.

Organization	Dan Pepper
Address	Route 2 Carthage, MS 39051
Contact	Dan Pepper
Telephone	(601) 267-8315
Funded By	Private
Cost	$15,000 (excluding owner labor)
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Dickens' Home

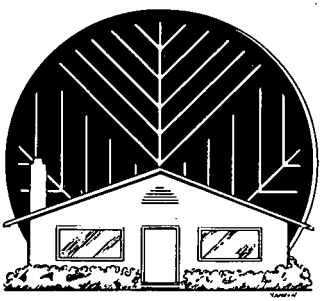
Organization	Foch Dickens
Address	Route 2 Walnut Grove, MS 39189
Contact	Foch Dickens
Telephone	(601) 253-2134

Foch Dickens has a passive hot water system located on his roof. A 5' x 6' flat-plate collector heats water in a tower behind the collector. The tank is enclosed in a discarded refrigerator body to which extra insulation was added.

The system met approximately 90 percent of the owner's requirements during the summer, and is projected to supply 60 percent during the winter. The average water temperature in the tank during the summer is 140 degrees.

Critique/analysis: The iron pipe used in the collector was hard to work with and will eventually have to be replaced.

Funded By	Private
Cost	$300
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

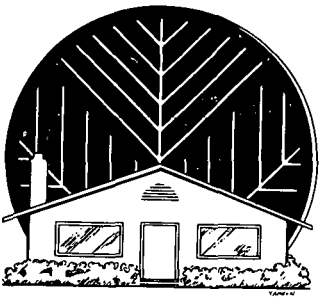
Category	Housing
State	MS
Project Name	Frazier Home

The Frazier's 3,600 ft^2 log home in Philadelphia has its space-heating, water-heating and cooling needs met by solar energy. Twenty-four units, each of 20 square feet, total 480 square feet of collector area. They are expected to provide 90 percent of the cooling needs, and 100 percent of the space-heating and water-heating needs of the building.

The units feature absorption cooling, and back-up heating is provided by a wood-fired boiler.

The hot water tank has a capacity of 775 gallons.

Organization	William N. Frazier
Address	Route 7, Box 259 Philadelphia, MS 39350
Contact	William N. Frazier
Telephone	(601) 656-7987
Funded By	Private
Cost	$10,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Garrett Hexagonal Hillside Home

The owner built this 1038 ft^2 hexagonal home into a hillside. Although the home is equipped with central heat and air conditioning, the owner has not yet found it necessary to connect the latter, and has preferred to use his wood heater for the limited amount of supplemental heat required.

Temperature in the home has not exceeded 78 - 80 degrees during the summer unassisted; no cold-weather performance data are available yet.

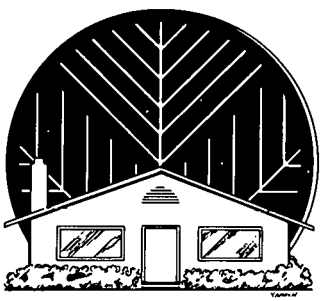
Two ceiling fans aid air circulation, and a dehumidifier prevents moisture build-up.

The average monthly electric bill is $35 to $40, most of which is accounted for by three freezers, a washer and dryer, a hot water heater, and other appliances.

Critique/analysis: No problems have been encountered to date.

Organization	William Garrett
Address	Route 1, Box 1991 Winona, MS 38967
Contact	William Garrett
Telephone	(601) 283-1329

Funded By	Private
Cost	$22,850
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Jim Snider Home

The only source of heat for this 2,300 ft2 owner-designed home is the 40-gallon high-efficiency gas-fired water heater. The owner is planning to add a solar water heater in the near future.

The walls of the house are insulated to R-22, and the ceiling to R-28; in addition, there are 3 1/2 inch fiberglass batts in all interior walls, so heat exchange between minimum- and maximum-use zones is minimal. This interior insulation also deadens sound and improves fire retardancy.

The double-glazed wood-framed windows comprise about 10 percent of the wall area of the house, and several skylights supplement the windows for natural light. The doors are made of insulated metal and double glass.

The roof is pitched at 45 degrees and is stressed to allow for addition of solar collectors. The rafters are raised to accommodate 8 inches of insulation over the walls.

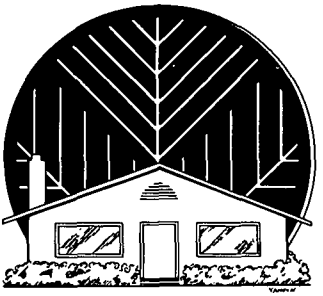
The heat exchanger is contained in a fan coil unit, and diverters in the duct system operate automatically to place air as needed in various zones of the house.

Even without special efforts at lowering energy consumption (house temperature is maintained year-round at about 73 degrees), the average total monthly utility bill, including gas and electricity, is $65 to $70.

Critique/analysis: No problems have been encountered in living in the house. Its construction had to be closely supervised by the owner, however, and the builder had some difficulties installing the perimeter slab insulation.

Organization	Jim Snider
Address	111 Heron Court Brandon, MS 39042
Contact	Jim Snider
Telephone	(601) 992-2566

Funded By	Private
Cost	Comparable to conventional house
Congressional District	III
Compilation Date	February 1980



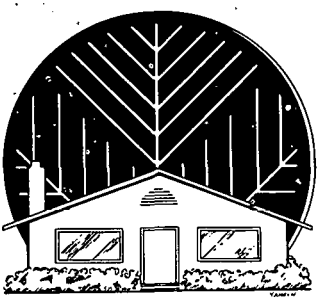
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Low-cost Solar Panels

John McKitrick has built a set of solar panels from low-cost and junkyard parts. These panels are presently heating one bathroom, but the owner plans to have them integrated into the whole house system.

Critique/analysis: The main difficulties have been finding funding for parts for the apparatus.

Organization	John McKitrick
Address	1208 Londonderry Ocean Springs, MS 39564
Contact	John McKitrick
Telephone	(601) 875-8808
Funded By	Private
Cost	$200 - $350
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Lambert Home

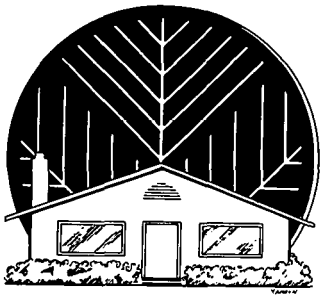
Roland Lambert has retrofited an air cooling system to an existing 2,000 ft^2 house. It met roughly 75 percent of the cooling requirements during the first summer. The system takes 78 - 80 degrees "return house" air through a 60 foot duct buried 10 feet deep, and returns it at 72 - 74 degrees to the house. Then one-third of this air is recycled through the system again.

The system is projected to provide air at 64 degrees during the winter. Gas heating and electric cooling back-up systems are used

The dual system has a life expectancy of 70 to 150 years. Installation required a 5 foot wide trench 30 feet long, but the system could be installed vertically.

Critique/analysis: Initially, water leaks occurred. The new ducts subsequently installed are watertight.

Organization	Roland Lambert
Address	3934 Meadowlane Dr. Jackson, MS 39206
Contact	Roland Lambert
Telephone	(601) 982-8092
Funded By	Private
Cost	$2,500
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	MS
Project Name	Thomas Crutchfield's Home

Thomas Crutchfield and his seven-member family live in an energy-efficient home he built.

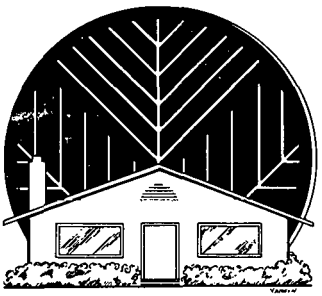
A heat pump heats and cools the 2,400 ft^2 house, but is seldom used, as natural temperature varies only from 67 degrees to 78 degrees. The house has been occupied since July 7, 1977, and has required supplemental heat for only two weeks in the winter of 1978.

The roof and three walls of the house are completely bermed with earth, and the remaining wall more or less faces south. Glass areas in three front doors and one back door supply some natural light, and two fireplaces supplement the heating.

The average monthly electric bill runs $55 to $60, and consists mostly of cooking, lighting, hot water, and appliance costs. The family is considering adding a solar hot water system to further reduce utility bills.

Critique/analysis: No problems have been experienced to date; the house is performing well and the owners are quite happy with it.

Organization	Private
Address	Bellefontaine, MS 39737
Contact	Thomas Crutchfield
Telephone	(601) 258-7680
Funded By	Private
Cost	$55,000
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

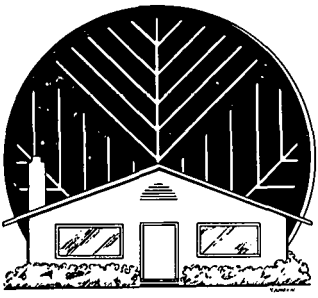
Category	Housing
State	MS
Project Name	Tompkins Home
Organization	Clint Tompkins
Address	Route 2 Kilmichael, MS 39747
Contact	Clint Tompkins
Telephone	(601) 262-7637
Funded By	Private
Cost	$40,000
Congressional District	II
Compilation Date	February 1980

This owner-built, 1,872 ft^2 home has three walls of one-inch reinforced concrete bermed with earth (except for high double paned windows on the back wall), and one wall of 2" x 6" studs overlaid with brick. The roof is supported by steel beams and bar joists with 7.5 inches of concrete on top covered with earth.

The home, which has been occupied since August of 1978, is heated by a single fireplace. Temperature varies from a low of 60 degrees in the winter to a high of 82 degrees on a 100 degree summer day.

Average monthly electric bills for this family of five are around $50, which is accounted for by the washer, dryer, freezers, cooking, and other appliances.

Critique/analysis: The home is performing well, and the family reports no problems associated with living in it. Getting initial financing was a problem, however, as lenders were unfamiliar with this kind of construction.



Renewable Resources—A National Catalog of Model Projects

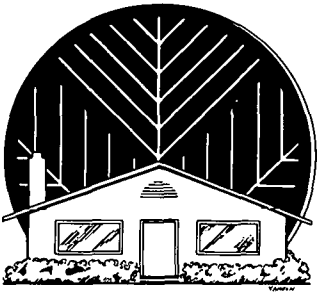
Category	Housing
State	MS
Project Name	Victorian House

This 3,938 ft^2 Victorian house has a large two-story solarium on the south side. Windows and doors open from the solarium to five other areas of the house. A reversible ceiling fan suspended from a beam in the solarium helps exhaust fans at the peak remove warm air in the summer, and brings solar-heated air down from the peak in winter. A brick floor over concrete slab provides thermal mass.

The house is designed with minimum window area on the north and west walls, and has a circulating fireplace in the den. The house is well insulated, with 12 inches in the ceiling and R-11 batts in the walls. In addition, foil-backed sheetrock was used on all exterior walls plus the solarium walls.

Back-up systems are gas heat and electric cooling. Water is heated by gas in winter and by the air-conditioner's exhaust in summer.

Organization	Gingerbread Homes, Inc.
Address	5935 Baxter Jackson, MS 39211
Contact	Edna Mills
Telephone	(601) 956-8836
Funded By	Gingerbread Homes, Inc.
Cost	$210,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

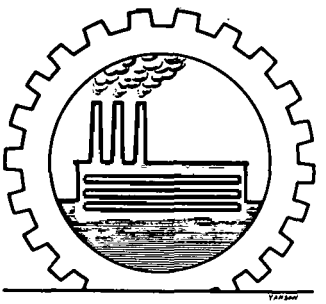
Category	Industrial
State	MS
Project Name	Solar Lumber Drying Process
Organization	J. A. LaCour Co.
Address	P.O. Box 625 Canton, MS
Contact	David LaCour
Telephone	(601) 859-4541
Funded By	ERDA, Lockheed Corp.
Cost	$450,000
Congressional District	III
Compilation Date	February 1980

In Caton, Mississippi, J.A. LaCour Kiln Service, Inc., has been using a solar system to meet a substantial fraction of its heating needs for a hardwood lumber facility of 50,000 board feet capacity. This solar kiln is, in a sense, a throwback to the days when lumber was naturally dried by the air. The old approach was abandoned for commercial purposes in the United States because air-drying lumber is very slow. But the growing need to curb the use of imported oil, the lumber industry is looking at industrial solar applications to diminish the use of about 170,000 barrels of oil a year in kiln-drying operations.

This system employs 2,500 square feet of flat-plate collectors and a 5,000-gallon storage tank to power a kiln used for drying hardwoods. The system has been operating for a little over two years, and it supplies approximately 45 percent of the total heat requirements of the kiln. Additional heat and back-up come from gas. The system is equipped with extensive computerized monitoring devices, which accounts for a substantial portion of the cost.

Critique/analysis: LaCour is among the first industrial solar process heat applications funded by the Department of Energy in the 1970s. While reliable performance data have been rather difficult to obtain, problems such as lowered performance from industrial plant effluents such as sawdust and stack emissions that accumulate on solar collectors have been delineated.

Although solar process heating hasn't been the cinch researchers once thought it would be, technological developments and field experience continue to improve the prospects for widespread industrial solar applications.



Renewable Resources—A National Catalog of Model Projects

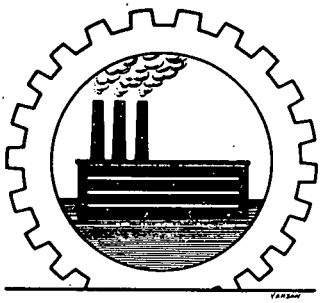
Category	Industrial
State	MS
Project Name	Sperry Vickers Solar Hot Water System
Organization	Sperry Vickers
Address	5353 Highland Dr. Jackson, MS 39205
Contact	Miles Tullos
Telephone	(601) 981-2811
Funded By	Sperry Vickers
Cost	Approx. $4,700
Congressional District	IV
Compilation Date	February 1980

Sperry Vickers has two solar-heated installations.

One installation provides 120-degree water for an oil separator and is also used to clean the apparatus.

The second installation provides domestic hot water for the restrooms in the plant.

Critique/analysis: No problems have been encountered to date with either system.

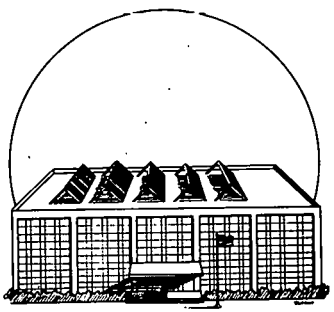


Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	MS
Project Name	NASA Solar System
Organization	NASA/NSTL
Address	National Space Technology Labs. NSTL Station, MS 39529
Contact	A. J. Rogers, Jr.
Telephone	(601) 688-2004
Funded By	DOE Solar Federal Bldg. Program
Cost	$490,000
Congressional District	V
Compilation Date	February 1980

The solar system at the National Space Technology Laboratories provides high temperature hot water for space heating and cooling through conventional heat exchangers and absorption chiller units. It also provides some process hot water and domestic hot water for building use.

The equivalent energy of about 50 tons of air conditioning is provided by the system.



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	MS
Project Name	Oyster Biology Resource Center
Organization	Gulf Coast Research Laboratory
Address	East Beach Ocean Springs, MS 39564
Contact	John T. Ogle
Telephone	(601) 875-2244
Funded By	Gulf Coast Research Laboratory, and Bureau of Marine Resources ($9,000 grant)
Cost	n/a
Congressional District	V
Compilation Date	February 1980

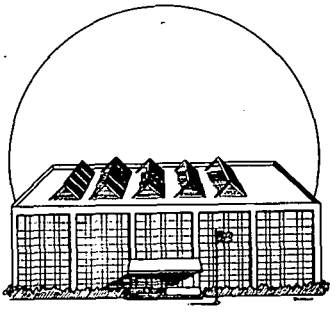
The Oyster Biology Research Facility of the Gulf Coast Research Laboratory is involved in several renewable resource projects.

A passively heated recirculating marine polyculture system has been used successfully to raise pompano, red snapper, and mullet over the winter. (With improved filteration, higher densities can be achieved.) The facility will be tested for holding and shedding blue crabs and for producing bull minnows for the bait industry on a year-round basis.

A low-cost solar greenhouse is used to bloom algae as food for larvae of oysters and copepods. In addition, a solar water heater is used to provide wash water for the tanks. An evaporative unit is used for cooling, and reflective blankets for retaining heat. The culture water itself (2,000 gallons) serves as a heat reservoir for maintaining temperatures in the otherwise unheated greenhouse. A solar still is being tested for producing brine to be used in adjusting salinities in culture tanks.

Several savanious windmills also pump water into a pond used for fish culture.

These projects represent an attempt to keep the cost of raising sea animals to a minimum.



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	MS
Project Name	Gulf Coast Community Action Agency

Approximately 80 homes in Harrison and Hancock counties have been weatherized.

Typical improvements include insulation, roof repair, skirting, window repair, caulking and weather stripping.

The agency is also cooperating with other agencies in weatherizing additional homes.

Organization	Gulf Coast Comm Action Agency
Address	Box 519 Gulfport, MS 39501
Contact	Brenda Morant
Telephone	(601) 863-2233
Funded By	CSA and DOE
Cost	$30,018 (CSA) $25,010 (DOE)
Congressional District	V
Compilation Date	February 1980

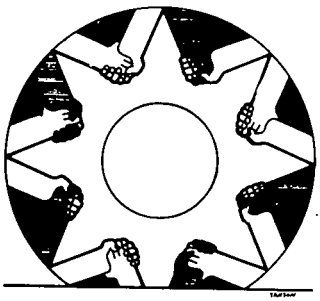
Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	MS
Project Name	Mississippi Solar Energy Association

The Mississippi Solar Energy Association developed a 20-picture slide show of solar houses in Mississippi.

Renters of the show should allow four to six weeks for delivery.

Organization	Mississippi Solar Energy Association (MISSEA)
Address	225 W. Lampkin Rd. Starkville, MS 39759
Contact	Dr. Pablo Okhuysen
Telephone	(601) 323-7246
Funded By	MISSEA
Cost	$20 each
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	MS
Project Name	Mississippi Power and Light

Mississippi Power and Light has installed, and is monitoring, five residential hot water systems.

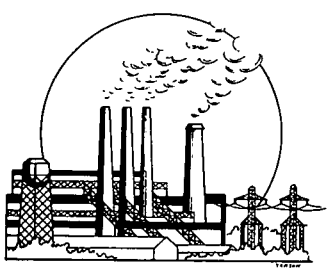
The systems comprise various components, collector fluids, and methods of heating the water in order to determine which is optimum for this area.

Each installation is being submetered for two years, after which time the utility believes it will be better able to advise its customers on the subject.

Critique/analysis: Minor maintenance problems have occurred.

Organization	Mississippi Power and Light
Address	P.O. Box 1640 Jackson, MS 39205
Contact	Truman Hunt
Telephone	(601) 969-2308

Funded By	Mississippi Power and Light
Cost	Approx. $10,500
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	MS
Project Name	MP&L Skills Development Center
Organization	Mississippi Power & Light
Address	P.O. Box 1640 Jackson, MS 39205
Contact	Truman Hunt
Telephone	(601) 969-2308
Funded By	DOE
Cost	$50,000 (including monitoring equipment) Solar increment $20,000
Congressional District	IV
Compilation Date	February 1980

Mississippi Power and Light's Skills Development Center's overnight facilities, located in Clinton, Missippi, are solar heated.

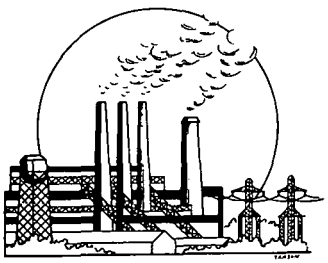
The solar system, designed and constructed by IBM under contract to the National Aeronautics and Space Administration (NASA), provides space-heating and water-heating. The unit, located adjacent to the building, has a 259 ft^2 array of flat-plate collectors. The array faces south with a tilt at 45 degrees to the horizontal.

Solar-heated air passes through a heat exchanger to preheat incoming water. Preheated water in the heat exchanger rises by thermosyphon action to a 52-gallon preheat tank, where it is stored. Water from the preheat tank is supplied to two conventional, 30-gallon, electrically heated domestic hot water tanks located in the site building.

When solar energy is insufficient to heat the load, an electrically operated strip-heat duct-mounted unit provides additional energy for space heating. An electric water-heating element in each of the two domestic hot water tanks provides auxiliary energy for water heating.

Storage is provided by a 11,000 pound rock bin.

Data is automatically collected every f inutes and is telemetered daily back t National Solar Data network computer operated by NASA in Huntsville, Alabama.



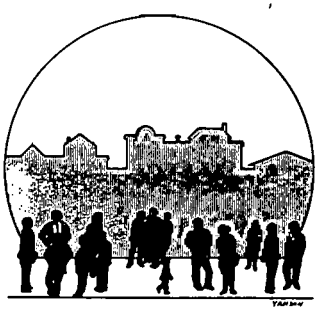
Renewable Resources—A National Catalog of Model Projects

Category	Community
State	MS
Project Name	Lauderdale County Weatherization Program

The Lauderdale County Economic Assistance Program has weatherized 107 houses in a five-county area to date. Initially, a field man creates an energy profile for each house and determines work and materials needed. The office then works up an invoice and submits it to the policy committee, which makes the final decision. Typical weatherization includes threshold sealing, door stripping, installing storm windows, repairing the roof and ceiling, and repairing or replacing doors and windows.

Critique/analysis: DOE funding has been erratic.

Organization	Lauderdale County Economic Assistance Program
Address	Meridian, MS 39301
Contact	Obie Clark
Telephone	(601) 693-4353
Funded By	Community Services Administration, DOE, CETA
Cost	$650 per house (maximum)
Congressional District	III
Compilation Date	February 1980

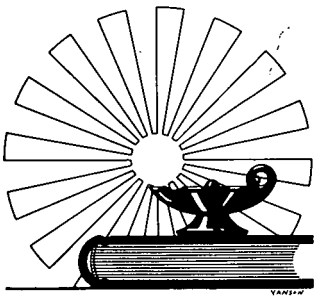


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Solar Greenhouse Workshops

The Mississippi Solar Energy Association hosts solar greenhouse workshops. In addition, the Association provides do-it-yourself information for the construction of simple or elaborate solar greenhouses.

Organization	Mississippi Solar Energy Association
Address	225 West Lamplin Rd. Starkville, MS 39759
Contact	Mrs. Pablo Okhuysen
Telephone	(601) 323-7246
Funded By	MISSEA
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

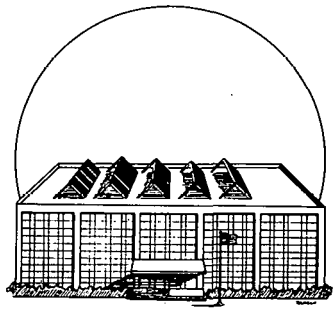
Category	Institutional
State	MS
Project Name	Solar Heat and Cooling for Army

This 17,000 square foot building has space-heating, cooling, and water heating supplied by a solar system consisting of 856 3' x 6' collectors that use glycol fluid. The storage has a 30,000 gallon capacity, and the system is backed up by a heat pump and oil-fired boiler.

The whole system is operated by a Honeywell Delta 1000 computer, and it is being monitored from Washington.

This building is one of five similar installations in the country.

Organization	U.S. Army Reserv Center
Address	Airport Greenville, MS 38701
Contact	Ken Rawlinson
Telephone	(601) 434-8852
Funded By	Army Reserve Center and ERDA
Cost	$1.8 million
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	MS
Project Name	Solar Research

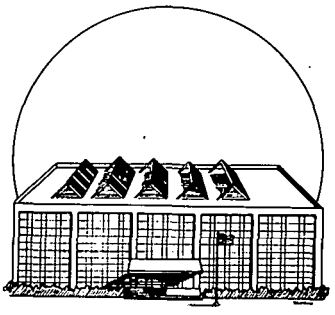
Construction is under way on Phase I of this construction project, which includes a fluidized-bed combustion system, a closed solar pond and a 10-kilowatt solar system for the swine facility. The wood-burning system, expected to be operational by early November, will generate 210-degree F water to supply space heat and service hot water to thirty-one buildings on the campus.

Phase II of the project includes construction of a photovoltaic test bed consisting of various types of chemical cells (some flat-plate, some concentrator), which will feed power back into the grid system for the entire campus. The coolant used in the photovoltaic array will supplement the hot water system.

Installation of the 200-kilowatt plant is scheduled to begin in mid-October and to be completed in January of 1980.

Critique/analysis: The primary difficulty has been in obtaining a sufficient number of bids on the general construction work. Some constructors appear to be hesitant, due to lack of experience, about getting involved in construction associated with a solar installation.

Organization	Northwest Mississippi Junior College
Address	Senatobia, MS 38668
Contact	Dan Ahearne TEAM, Inc.
Telephone	(703) 971-3050
Funded By	DOE
Cost	$7.7 million
Congressional District	I
Compilation Date	February 1980



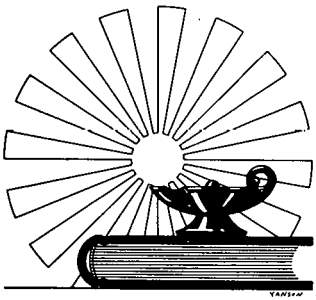
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	MS
Project Name	Technical Solar Training

The Mechanical Engineering Department offers a program for engineering students who want to gain technical competence in solar energy. A course at the senior or graduate level is taught on solar energy thermal processes. In addition, many students select a solar project for their work in "Mechanical Engineering Practice," which entails problem definition, synthesis of solution, laboratory or field analysis, documentation, and presentation.

Organization	Mississippi State University
Address	Mechanical Eng. Dept. MS State University Mississippi State, MS 39762
Contact	Dr. Richard Forbes
Telephone	(601) 325-4915

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



NORTH CAROLINA

1. Apex
2. Asheville
3. Bear Creek
4. Boone
5. Chapel Hill
6. Charlotte
7. Durham
8. Elizabeth City
9. Goldsboro
10. Greensboro
11. Hendersonville
12. Leicester
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17. Sylva
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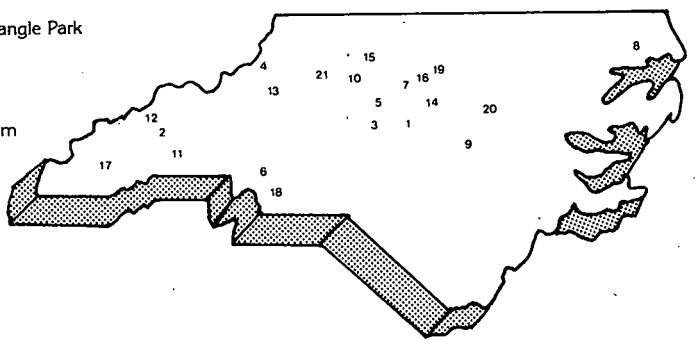

NORTH CAROLINA

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Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	NC
Project Name	The Burnham Solar Greenhouse

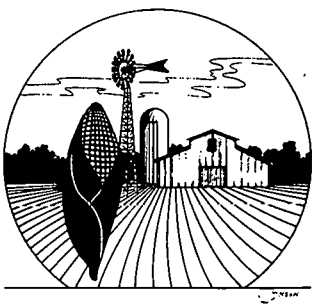
An 8' x 12' greenhouse of two-slope "hip" roof design was built from lumber reclaimed from demolition of an old school building. Eight-foot long rigid frame trusses were laid out and nailed together on the workshop floor using 3/4" x 2" material and 1/4 inch exterior plywood gussets at hip and ridge. These trusses were later assembled on two-2-foot centers with 3/4" x 2" horizontals to form the 12-foot building. The first two-2-foot increment at the door-end of the structure was covered with exterior 1/4 inch plywood to give it greater stability. The rest of the exterior was covered with plastic film, stapled on. The foundation was built of leveled 6" x 8" timbers salvaged from the school with two-3-foot extensions to form side beds on the exterior. These were filled with decomposed sawdust and compost for insulation.

Two 12-foot long benches constructed with a slatted lower shelf were installed clear of exterior walls. Slatted shelves were filled with 240 plastic one-gallon milk jugs filled with water to act as a heat sink. Openings between stacked jugs and slat shelves allow air circulation. Heat built up during exposure to daytime sun keeps the house above freezing at night.

Critique/analysis: The greenhouse has functioned well through two winter seasons with no exterior heat source. Lettuce, spinach, onions, and seedlings for transplant have thrived, and geraniums have been rooted there. Plans are to replace plastic film (so far replaced twice) with more durable fiberglass.

Organization	Mark Burnham
Address	Route 3, Box 206E Apex, NC 27502
Contact	Mark Burnham
Telephone	(919) 549-0551

Funded By	Private
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	NC
Project Name	The Fowler Solar Barn

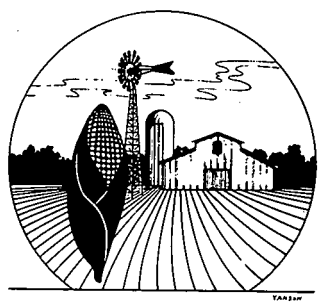
Joe Fowler, an engineer, inventor and farmer, has developed a full-scale, solar-assisted barn. The barn uses 30 percent less fuel than conventional bulk barns do.

In the academic community, tests of the collector systems and heat-recovery components have been in progress for several years. The units have been tested in conjunction with multiple uses: grain-dryers, greenhouses, and tabacco-curing facilities in locations from Florida to Virginia. Savings in fuel usage was typically greater than 50 percent.

In 1978, Fowler received a DOE grant of $55,000 for assistance in commercializing the barn. The grant was one of 29 chosen out of a pool of 9,000 applicants.

Organization	Joe Fowler
Address	Route 2 Box 39 Reidsville, NC 27320
Contact	Joe Fowler
Telephone	(919) 342-0351

Funded By	DOE
Cost	$55,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	NC
Project Name	Greenhouse Bulk Curing Solar Barn

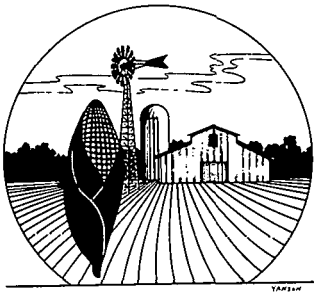
The greenhouse/bulk-curing solar barn consists of a bulk-curing module inside a specially designed greenhouse. It captures and stores solar energy in two ways. First, as a bulk-curing structure incorporating dehydration and electric power-saving features, it directly collects, stores, and uses energy from the sun to cure tobacco. Second, as a greenhouse, it relies on photosynthesis for maximum plant growth in a controlled environment. This multi-purpose farm structure provides an efficient means of utilizing solar energy in the production of tobacco and greenhouse crops, so that the investment can be utilized year-round.

The outer walls of this dual-purpose structure are made of corrugated clear fiberglass that traps the sun's rays. The heat is distributed by a system of fans and ducts. Surplus heat during the day is piped through a gravel energy storage system in the foundation. The gravel stores the energy for use at night. A furnace switches on when additional heat is needed.

was constructed and tested in the summer of 1973 with the cooperation of Ray Harvell, a farmer in southern Wake County, North Carolina. Four-year field use of this solar barn showed effective solar-energy utilization, high quality cured tobacco, and fuel savings of about 25 percent, as compared to conventional bulk-curing barns. The second unit was constructed and tested at the Central Crops Research Station of North Carolina State University in the summer of 1975. Four years of field tests indicate that the solar barn provided good curing and cut fuel use by 47 to 54 percent, as compared to a conventional bulk barn. The third unit is located at the Department of Biological and Agricultural Engineering, North Carolina State University.

Organization	Dept. of Bio. & Agric. Engineering, NC State University
Address	Raleigh, NC 27607
Contact	Dr. Barney Huang
Telephone	(919) 737-3121

Funded By	DOE, NC Energy Inst., National Science Foundation
Cost	$174,000
Congressional District	IV
Compilation Date	February 1980



At the end of the tobacco-curing season, the solar barn was converted to a greenhouse to grow a crop of flowers (Kalanchoes) with excellent results. The converted barn is also used to grow tobacco transplants in multi-layers. This method maximizes space and solar-energy utilization, making transplant production uniform. It also eliminates laborious conventional plantbed and transplanting operations since it is fully automatic transplanting.

As efficient as this solar barn is, it is also inexpensive. Moreover, it is easy to build.

The solar barn can be built at an estimated cost of $11,000-$12,000, compared to $9,000 for a conventional bulk-curing barn. However, the unit can cure more than one and one half times the capacity of conventional bulk barns. The greatest advantage is that a farmer can use his solar-heated barn after the tobacco curing season as a fully temperature-controlled greenhouse, further justifying the initial investment.

Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	NC
Project Name	Production of Methane and Fertilizer from Raw Sewage

Charles Besser, a 72 year-old heating and plumbing contractor has built an anaerobic digestor which he says can produce usable methane gas and fertilizer from raw sewage.

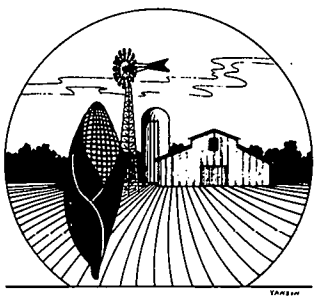
He has built a working model at his house, and he used the gas to partially heat his home, light lamps, and cook food. The fertilizer, an odorless liquid, keeps his yard green.

Besser says his system is based on the chemical breakdown of biodegradable material from sewage to table scraps and leaves. Gas and fertilizer are the products.

"The gas is mostly methane with a little propane, clean energy," he says. He estimates his system, hooked to Charlotte's sewage system, could produce enough gas to heat all the city's homes.

Critique/analysis: Besser admits his system would be too expensive for individual homeowners and would not be cheap for businesses, but he contends that using it would save energy and be cost-effective in the long run.

Organization	Charles Besser
Address	2800 Commonwealth Ave. Charlotte, NC 28205
Contact	Charles Besser
Telephone	(704) 334-3233
Funded By	Owner
Cost	n/a
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	NC
Project Name	Chapel Hill Solar Community Transit Building
Organization	Town of Chapel Hill
Address	400 University Square West Chapel Hill, NC 27514
Contact	Ted Hoskins
Telephone	(919) 942-5174
Funded By	Department of Transportation, City of Chapel Hill
Cost	$1,200.00
Congressional District	IV
Compilation Date	February 1980

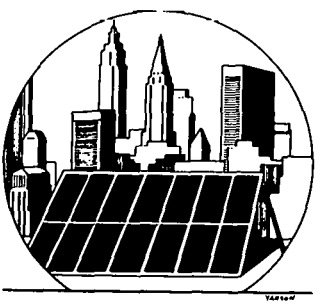
The new 15,000 ft^2 Transit Operations and Maintenance Facility in Chapel Hill will be equipped with an hybrid active/passive solar system.

The facility, located at the Municipal Operations Complex at the Horace Williams Airport, will house the maintenance and operations functions for the Town's community transit fleet of 50 buses. The building will include four bus-maintenance bays, a tool-and-parts storage area and machine shop, a service lane with bus vacuum and automatic bus washer, and an operations area with showers, lounge, and locker space for bus drivers. It will also contain space for dispatchers and supervisors.

In the winter, the building will rely on 4300 square feet of south-facing glass for passive solar heat gain. Most of this glass will be insulated transparent glass block, a glazing material more durable in an industrial application than plate glass. The heat will be stored in the thermal mass of the building's concrete floor and in outside-insulated concrete block walls.

In the summer, four high-capacity exhaust fans will provide night-time ventilation for cooling the structural mass. The six overhead doors serving the facility will lock in a partially open position so that the thermal pressure gradient within the building is optimized and fan assistance is maximized.

Active water solar collectors will provide almost 100 percent of the building's hot water.



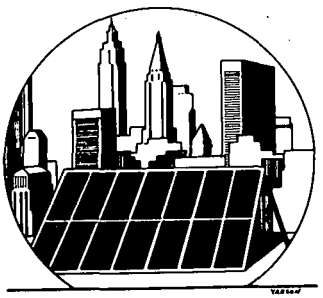
Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	NC
Project Name	Greensboro Residential Energy Audit Program

The City of Greensboro, North Carolina, has conducted energy audits that provide residents with useful information on their homes' present energy efficiency and about various insulation techniques that can lower their monthly energy bills by reducing energy consumption.

The city fire department completes an energy evaluation, which is then sent to Duke Power for analysis. The utility then provides several types of information: an estimate of current energy costs based on usage estimates, current energy prices, type of house and weather conditions; a prioritized list of recommended insulation improvements; a rough cost breakdown on the recommended improvements; and an estimate of the amount of money the homeowner can expect to save once the home is made energy-efficient. It also specifies the length of time required to bring a return on the investment and the names of approved contractors. Finally, it offers free technical assistance from Duke Power.

Organization	City of Greensboro
Address	217 N. Elm Greensboro, NC 27401
Contact	Steve Burton
Telephone	(919) 373-2356 (919) 378-9451 ext. 185
Funded By	City Government & Duke Power Company
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	NC
Project Name	Town of Wake Forest - Energy Conservation Program
Organization	Town of Wake Forest
Address	P.O. Box 352 Wake Forest, NC 27587
Contact	Stephen F. Rollyson
Telephone	(919) 556-2024
Funded By	Community Development Block Grant, State Government
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

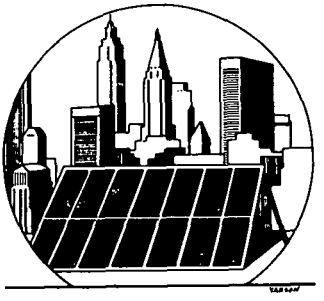
The Town of Wake Forest, an electric city, has been very interested in energy conservation. The thrust of the town's programs has been to put conservation ideas into practice and to inform the general public on ways to conserve energy.

In 1978 the Town of Wake Forest was one of few local governments in North Carolina to receive an Energy Conservation Grant, to help inform the public on various ways of conserving energy and saving money. With its grant, the town hired an Energy Conservation Officer who conducted seven workshops. Sponsored by the Wake Forest Energy Conservation Program, these workshops featured guest speakers, films, and free energy-conservation literature.

In addition, the department was invited to give presentations to two local summer arts-and-crafts programs for children. These presentations received coverage by the local news media.

The department also distributed packages of free energy-conservation information to homes in the Community Development target areas. This was done with the hope of genuine and well-informed interest in the conservation of energy.

In conjunction with the Wake Forest Community Development Department and agencies with similar goals, such as Wake Opportunities and Wake County Council on Aging, over seventy homes were winterized. Measures taken included the installation of storm windows, storm doors, and ceiling insulation, and weatherstripping around all outside doors. With the Community Development Block Grant funds and the financial and manpower assistance from the other interested agencies, the town was able to help many low-income families have decent winterized homes, save on their fuel bills, and have access to energy-conservation information.



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	NC
Project Name	Historic Preservation with Solar

A 2300 square foot duplex residence in the Montford National Historical Preservation District in Asheville, North Carolina, was completely renovated and solarized. The building was on the verge of being condemned by the city when it was purchased by Sunbright.

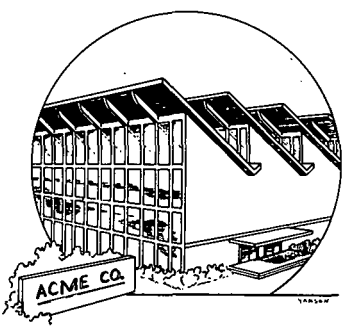
Three separate solar applications were utilized in the renovation. Stringent energy conservation measures were undertaken: the walls and ceilings were insulated, window quilts were installed, south-glazing along the living area was increased, and thermal mass was added. A vertical wall solar collector was designed for and added to part of the southern wall, and a domestic solar water-heating system was mounted on the roof.

A natural gas-fired hot water system was renovated and is used as a back-up system.

Critique/analysis: The success of this project hinges on the cost-effective synthesis of conventional renovation and solar design criteria.

Organization	Sunbright Company
Address	P.O. Box 948 Asheville, NC 28802
Contact	Roger Sherman Lawrence Dorsey
Telephone	(704) 254-3834

Funded By	Private
Cost	n/a
Congressional District	XI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	NC
Project Name	Solar-assisted Office Building

The architectural staff of J. Aubrey Kirby Associates, Inc., is now located in a new passive solar office building.

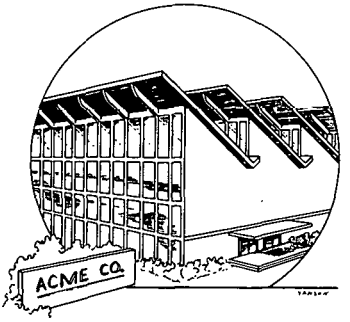
The building consists of 1,764 square feet on the main level with 882 square feet of additional storage area on the upper level. The south wall features a solar atrium, 12 ft x 16 ft, that is entirely enclosed in plexiglass.

On a typical winter day with sun, the heat collected in the atrium is usable at about 9:30 a.m. and will continue to heat until about 5:00 p.m. Chrome venetian blinds are used to keep heat in or out at night and during the summertime. Interior masonry walls and concrete floor act as thermal storage mass.

Other energy-conservation features include double-and triple-glazing, metal insulated doors with magnetic weatherstripping, R-30 insulation in the ceilings, and a timer on the electric hot water heater.

The building requires about 55 percent less energy because of these passive solar design features than a conventional building of the same size does.

Organization	J. Aubrey Kirby Associates, Inc.
Address	234 S. Broad Street Winston Salem, NC 27101
Contact	J. Aubrey Kirby, AIA
Telephone	(919) 723-2984 (919) 723-6706
Funded By	Private
Cost	$90,000
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	NC
Project Name	Solar Installation on a Newspaper Company

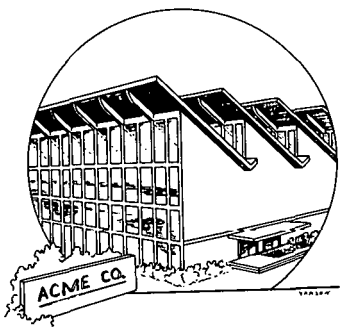
The Raleigh News and Observer owns and publishes the principal daily morning and afternoon newspapers for the city of Raleigh and the surrounding areas. With a history of endorsing solar energy to its readers, the paper felt the need to experiment with the technology and save energy costs. It thus installed a three-panel solar hot water unit and several other conservation measures.

During the first winter after installation, the News and Observer saved $12,411 on heating bills. The savings were attributed to reducing the hot water tap temperature by 25 degrees F, turning down thermostats, and recycling waste heat, as well as to adding the solar unit.

How does the company's solar system work? Heat is transferred from air that passes through the collectors to two hot water systems. One system provides the hot water for the building. The other, a closed system, connects with six 120-gallon heat-storage tanks. When needed, the stored hot water is piped through heating ducts on each floor, where it heats blower-forced air. The water then picks up the waste heat from around the air conditioners used to cool the company's computers and pumps it back to the solar unit's heat exchanger.

Although some delays were encountered at the onset of the project, the News and Observer states that the system is "working better than originally expected."

Organization	The Raleigh News and Observer
Address	215 South McDowell St. Raleigh, NC 27601
Contact	Mr. Mims
Telephone	(919) 821-1234
Funded By	n/a
Cost	$16,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	NC
Project Name	Piedmont Crescent Energy Project

The North Carolina Piedmont Crescent Project is an interactive research/public involvement project involving members of the faculty of the University of North Carolina at Chapel Hill and persons involved in making energy-related decisions at the local level. The major concerns of the project group are energy, water, land use, population, and employment. The approach has been to put together county-by-county data on these issues as well as on a number of "surrogate parameters" as a means of cross-checking the validity of the methodology and providing reinforcing information for individual decision-makers.

Since 1977, a small group of researchers at Chapel Hill has begun to examine the interaction of energy use and other quantifiable parameters in the 12 counties of the North Carolina Piedmont Crescent. The Counties and the Councils of Government of which they are a part are Orange, Durham, and Wake; Almanance, Davidson, Forsythe, Guilford, and Randolph; and Cabarrus, Gaston, Mecllenburg and Rowan.

The area under study is an urbanized industrial/transportation corridor that runs through the heart of North Carolina. These 12 counties constitute 12 percent of the land area, contain 35 percent of the population, possess 45 percent of the State's real and personal property; use 50 percent of the State's gross energy, and provide 44 percent of the manufacturing employment.

The study, expected to be completed in the Spring of 1980, was carried out on a county-by-county level, and the final report will consist of 12 reports, each written by persons within the counties and by persons associated with the project at Chapel Hill.

Organization	Piedmont Crescent Energy Project
Address	Dept. of Physics & Astronomy, Phillips Hall 039A Chapel Hill, NC 27514
Contact	Thom Gunter Norm Gustaveson Joe Straley
Telephone	(919) 933-3010

Funded By	n/a
Cost	n/a
Congressional District	II, IV, V, VI, VIII, IX, X
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	NC
Project Name	Solar Greenhouse Employment Project

Since 1978, the Solar Greenhouse Employment Project (SGEP) has been working in the rural South to promote the construction and use of solar greenhouses. The introduction of solar greenhouses can provide employment in construction, reduce heating costs, and create possibilities for additional income through horticultural use. Energy-producing devices such as solar greenhouses are especially beneficial to rural communities. The goals of the SGEP are two-fold: to help stabilize the economy of rural Southern communities and to promote and demonstrate the use of low-cost solar and appropriate technology as a viable method for reducing energy and food costs.

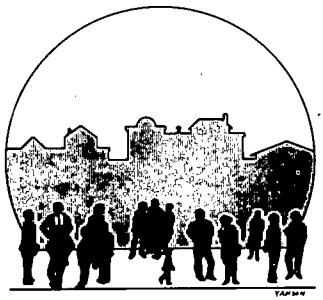
The Project focuses on three major activities. The first step involves introducing the concept of solar greenhouses and helping interested groups organize construction workshops within their communities. The most visible activity is the greenhouse-construction workshops, which focus on teaching and sharing construction skills with local participants--thus enabling people within the community to become self-reliant in future greenhouse-construction projects. Following construction the Project identifies and trains local resource people in greenhouse production and use.

In North Carolina, SGEP has worked extensively with the Frank Porter Graham Center Demonstration Farm and Educational Center located rural Anson County. The Graham Center works small family farmers, emphasizing low-cost, ecologically sound farming methods.

In working with the Graham Center, the Project has emphasized the use of diverse construction materials and the applicability of solar greenhouses to a variety of structures. Four greenhouses were constructed, two of them for mobile homes. The first greenhouse, attached to the Graham Center's main building, was built in January 1979 using all new materials at a cost of $820. The fourth greenhouse , attached

Organization	Solar Greenhouse Employment Project
Address	Route 3 6 Jeremiah Drive Chapel Hill, NC 27514
Contact	Paul Konove
Telephone	(919) 929-7072

Funded By	Local Funds
Cost	n/a
Congressional District	II
Compilation Date	February 1980



to the home of a local farmer, was built primarily by area farmers using mostly recycled materials at a cost of only $300.

The SGEP also presented educational workshops consisting of slide shows and seminars to the local community.

Critique/analysis: The SGEP is working to demonstrate that individuals and rural communities can become more self-reliant. Its belief is that if greater amounts of energy for heating homes can be locally produced, money generated in the community will tend to stay there.

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	NC
Project Name	Students Build Solar Shower

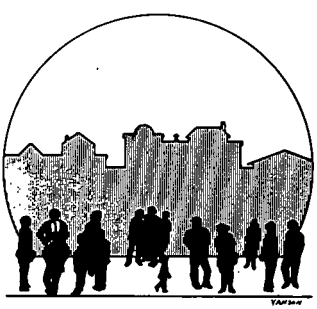
The Carolina Friends School (CFS), a private school founded by Quakers in 1964, has a solar heated shower.

The project was conceived, organized, designed and built by students. Three recycled 55-gallon tanks painted black provide 165 gallons of sun-heated water for showers. The tanks sit in an insulated box with a glass top facing south. The water in the tanks often gets to be too hot for a shower.

The project was a group effort. More than 50 students helped dig the foundation, pour the concrete floor, build the walls, and hew the wood for the roof. Despite the periodic lack of interest by students, the project was completed.

Two shower heads have water-conserving features. Each shower takes one to three gallons of water.

Organization	Carolina Friends School
Address	Route 1, Box 183 Durham, NC 27705
Contact	Wells Eddleman
Telephone	(919) 383-6602
Funded By	Carolina Friends School
Cost	$600
Congressional District	II
Compilation Date	February 1980



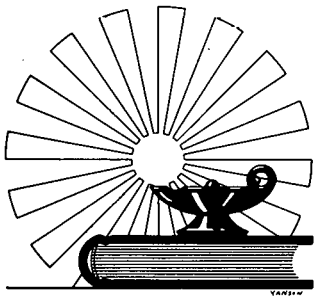
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Energy Dome at NC State Fair

The North Carolina Coalition for Renewable Resources coordinated, organized, and designed an energy exhibit at the 1979 North Carolina State Fair. The focus of the exhibit was on energy conservation and renewable energy use on the domestic scale. The exhibition was an integration of selected commercial projects and technologies involving state-wide organizations, state agencies, local groups, grassroots activities, educational institutions, and individual projects and programs.

Organization	North Carolina Coalition for Renewable Resources
Address	P.O. Box 10564 Raleigh, NC 27605
Contact	Gary Gumz
Telephone	(919) 737-2206

Funded By	In-kind Services of NC State Fair Committee
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Experimental Renewable Resource Programs for Farmers
Organization	Frank Porter Graham Experimental Farm and Training Center
Address	Route 3, P.O. Box 95 Wadesboro, NC 28170
Contact	John Gauci
Telephone	(704) 851-3146
Funded By	Rural Advancement Funds Gov. Contracts, Foundation Grants
Cost	n/a
Congressional District	VIII
Compilation Date	February 1980

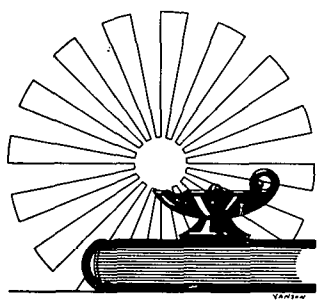
The Frank Porter Graham Center is an experimental 650-acre farm conducting research, demonstration, and training programs geared to the problems of small farms. The Center is a branch of the Rural Advancement Fund of the National Sharecroppers Fund.

The Graham Center offers several information-sharing programs in renewable energy applications and agricultural methods. It serves as an investigative and screening facility for various studies that have been done on solar grain- and food-drying, as well as for mobile homes equipped with passive greenhouses for heating and food production. Passive solar designs are emphasized for area farmers because of the high initial costs of many active systems. The Center would like to establish a revolving finance fund for solar greenhouses so that farmers can afford their initial $200 cost.

Farming methods are critically important to the Center's programs. The Center stresses natural farming, methods that do not use chemicals or pesticides.

A small resource center is available for farmers' use and includes an audio-visual section for those who are unable to read. The Center also publishes a free newsletter, Rural Advance, four times a year.

The Center devotes much of its attention to training programs. One program trains 25 small farmers from six counties in a wide range of technical and non-technical skills. The farmers then return to their communities and share the new skills (bookkeeping, equipment repair, carpentry, welding, and masonry) with 15 to 20 other local farmers. The Center hopes to reach around 500 farmers per year with this project.



(Information regarding this program was obtained from Southern Profiles: Appropriate Technology in the Southeast, Georgia Institute of Technology, Atlanta, Georgia.)

Renewable Resources—A National Catalog of Model Projects

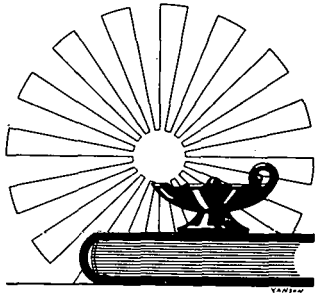
Category	Education
State	NC
Project Name	Hydronic Solar Test Facility

A facility for testing solar liquid-type collectors has been established in the School of Engineering at North Carolina A & T State University. The test facility, consisting of two dual-axis tracking platforms and associated equipment, can test efficiency of both flat-plate and concentrating-collectors to ASHRAE 93-77 standards. Data acquisition and reduction is computerized. Tests on pressure drop and incident angle modification can be conducted. Full weather instrumentation is included in the test facility.

In addition to testing liquid solar collectors, facilities are available for testing single photovoltaic solar cells, as well as both flat-plate and concentrating solar cell arrays for total energy production (electric plus thermal). Solar cells can be tested for V-J characteristics, spectral response, and temperature dependence of performance characteristics.

Organization	School of Engineering, North Carolina A&T State University
Address	Greensboro, NC 27411
Contact	Dr. David E. Klett
Telephone	(919) 379-7620

Funded By	DOE
Cost	$99,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

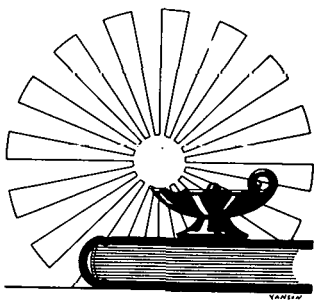
Category	Education
State	NC
Project Name	Long Branch Environmental Education Center
Organization	Long Branch Environmental Education Center
Address	Route 2, Box 132 Leichester; NC 29748
Contact	Paul Gallimore Jean MacGregor
Telephone	(704) 683-3662
Funded By	Non-profit organization set up as a land trust
Cost	n/a
Congressional District	XI
Compilation Date	February 1980

Long Branch Environmental Education Center (LBEEC) is a non-profit, tax-exempt organization located in the Newfound mountain range, 25 miles northwest of Asheville, North Carolina at the headwaters of Big Sandy Mush Creek. Long Branch perceives its role as demonstrating the interface between human habitation and nature-as-wilderness.

In pursuit of this goal, LBEEC designed and constructed three passive solar buildings at Long Branch. Constructed mostly of native wood and stone, the buildings appear integrated into the landscape. Back-up heating systems for each of the shelters are wood-fired cookstoves and heaters. Water-heating for one of the homes is provided by a passive thermosyphon system.

A commercially available, Canadian, non-electric, composting toilet is installed at one of the staff residences, and two passive solar composting toilets are scheduled for construction in the Spring of 1980.

Two attached solar greenhouses have been designed and are scheduled to be constructed as part of the Big Sandy Mush Creek Solar Greenhouse Project. The purpose of the project is to demonstrate the effectiveness and the energy-and food-producing potential of this passive technique in the Southern Appalachians. One greenhouse will feature an integrated system that includes a pit-type aquacultur pond with carp, tilapia, Malasian prawns, and eels. It will also have earthworm beds situated beneath rabbit hutches.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Mother Earth News

Organization	Mother Earth News
Address	P.O. Box 70 Hendersonville, NC 28791
Contact	n/a
Telephone	(704) 693-0211

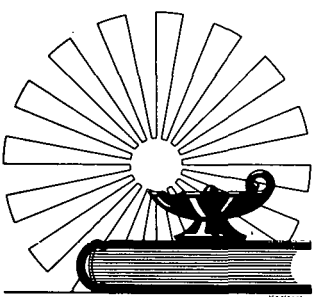
Funded By	Private
Cost	n/a
Congressional District	XI
Compilation Date	December 1979

Mother Earth News is a bi-monthly publication with offices located in Hendersonville, North Carolina. It places a heavy emphasis on alternative energies, alternative lifestyles, ecology and nature.

During the summer months, a variety of seminars are conducted in Transylvania County. These seminars offer a learning experience for those persons who are interested in becoming more self-sufficient. They include, but are not limited to, residential solar systems, do-it-yourself earth-sheltered homes, solar greenhouses, and ultra-low cost solar-heating systems.

These seminars, which range in length from one to three days, are open to the public at a cost of $40 per day. Further information on these and other seminars can be obtained by contacting Mother Earth News.

This organization also owns two trucks that are powered by alcohol fuels produced by the organization. These vehicles are driven nationwide by staff members who conduct one-day seminars on building a still and producing alcohol. This touring seminar has been highly successful in promoting the effectiveness of alcohol as a fuel.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Passive & Active Solar Retrofits at NC A&T University

North Carolina A&T University has retrofitted its two-story Home Management House with solar energy devices. The project was undertaken in recognition of the need to study consumer attitudes toward and acceptance of solar retrofits.

The retrofitted system consists of active solar water-heating and passive space-heating.

The two 55 square foot collectors used in the water-heating system were fabricated on site, using 2" x 6" wood joists, insulated boards, glazing, and copper pipes. The construction is simple, making the collectors very low-cost, yet very efficient.

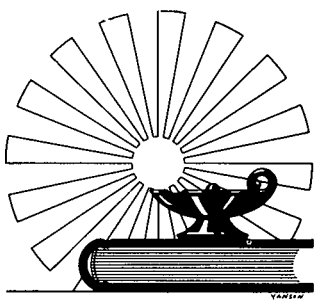
A pyrometer measures the insolation while a Btu meter measures the heat delivered to the storage tank. The data, including the amount of water used, is being collected continuously.

A 20' x 10' x 12' solar greenhouse, attached to the southern side of the house, provides the passive heat gain.

Supplemented heat is provided by a wood stove and a conventional gas heating system.

Organization	Mechanical Engir ng Dept., North Carolina A&T University
Address	Greensboro, NC 27411
Contact	D. Y. Goswami D. E. Klett
Telephone	(919) 379-7620

Funded By	North Carolina Energy Institute
Cost	$23,900
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

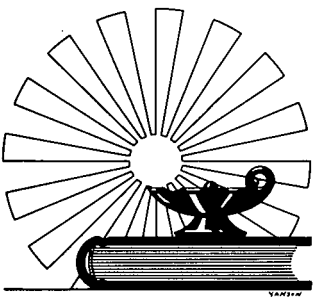
Category	Education
State	NC
Project Name	Passive Design Competition

In 1979, the North Carolina Solar Energy Association (NCSEA), under contract to the North Carolina Energy Institute, sponsored a passive solar residential design competition. A total of 46 designs were submitted, 16 of which received awards.

A booklet depicting winning designs is available to the public from the North Carolina Solar Energy Association.

Organization	North Carolina Solar Energy Association
Address	P.O. Box 12235 Research Triangle Park, NC 27709
Contact	Leon Neal
Telephone	(919) 549-0671

Funded By	North Carolina Energy Institute
Cost	$8,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

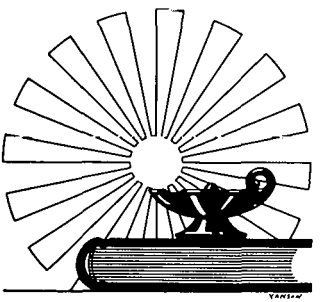
Category	Education
State	NC
Project Name	Photovoltaic Testing Facility

A facility for testing solar cells has been developed in the Department of Electrical Engineering at North Carolina A & T State University. The spectral response, I-V characteristics, and conversion efficiency of solar cells can be obtained under (xenon and ELH) lamp-simulated conditions with the aid of a HP 9830A desktop computer and accessories.

In addition, test facilities are under development for testing solar cells under sunlight concentration (100-1000 suns) and temperature-cycling conditions.

Organization	North Carolina A&T Univ., Electrical Engineering Dept.
Address	Greensboro, NC 27411
Contact	Dr. E.K. Stephanakos
Telephone	(919) 379-7620

Funded By	North Carolina General Assembly
Cost	$150,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Solar Systems Survey of North Carolina
Organization	North Carolina Solar Energy Association
Address	P.O. Box 12234 Research Triangle Park, North Carolina 27709
Contact	Leon Neal
Telephone	(919) 549-0671
Funded By	NC Energy Division: Telephone Services
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

In 1978 the North Carolina Solar Energy Association attempted to determine the number of solar energy systems in use in the state. A survey was designed to determine the total number of solar domestic hot water systems, space-heating systems, and industrial/commercial installations.

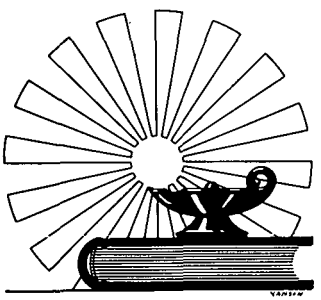
Eighty two of a known 104 companies/dealers were contacted by telephone. The remaining 22 companies (20 percent) could not be contacted by telephone and were sent written survey requests. Seven of these 22 companies returned the written survey forms completed. Several of the other companies are known to have left the solar field.

Twelve manufacturers of solar collectors were identified. In addition, the survey located seven distributors of solar collectors and 65 suppliers/dealers/installers, as well as several engineers who install solar systems.

In all, 615 solar domestic hot water systems and 126 space heating/hot water systems--a total of 741 systems--were identified. Of these, 23 are located on commercial buildings and the remaining systems are on residences.

Do-it-yourself systems and systems installed by dealers now out of business are extremely difficult to locate and count. It is estimated that this current survey represents at least 80 percent of the solar systems in the state operating on February 15, 1979. This would indicate that the maximum number of solar systems in the state would be no more than 930 systems--770 domestic hot water and 160 space heating/hot water.

This estimate does not include some 75 to 100 systems under construction at the time of the survey, nor does it include 25 solar bulk tobacco-curing barns.



For approximately 56 percent of the survey-found systems, the county of location was given. The distribution of these systems was analyzed and it was found that 58 of the 100 counties in North Carolina have at least one solar system. Also, of these 56 counties, seven counties have at least 10 systems, one county has at least 20 systems, three counties have at least 30 systems, and one county has over 40 systems. Since location was not given for over 40 percent of the systems, it is certainly conceivable that almost every county could have at least one solar system now in operation.

Renewable Resources— A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Solar Training Programs for Secondary Vocational Students
Organization	NC Dept. of Public Instruction, Trade & Indus. Educ. Sec.
Address	Vocational Education Building Raleigh, NC 27611
Contact	Dr. Ted Rollins Ben Albright
Telephone	(919) 733-7421
Funded By	NC St. Energy Con. Plan, Appalachian Reg. Com., St. & Fed. Funding for Voc. Ed.
Cost	$243,453
Congressional District	II, V, VIII, X, XI
Compilation Date	February 1980

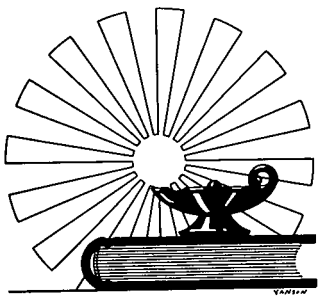
To promote energy awareness and conservation while meeting manpower needs in new and emerging occupations, the Trade and Industrial Education Section of the North Carolina Department of Public Instruction is involved in secondary vocational training programs in solar energy. Ten pilot programs throughout the State for training students to design, fabricate, install, and maintain both solar energy systems and conventional climate control systems were established.

"We are trying to educate both the students and local citizens about the serious need of conserving current energy reserves," said the project director, Dr. Ted Rollins. This type of program can reach thousands of citizens through promotional displays, the demonstration of alternate energies, "live project" installation of solar energy systems into existing homes and student-built homes, and community-awareness activities. Their programs are designed to help meet the manpower requirements of the new solar industry.

Funding for six of the ten schools was through the Energy Division's State Energy Conservation Plan and vocational monies. Funding for the four other schools was through a grant from the Appalachian Regional Commission and from State and Federal funds for Vocational Education.

About 250 students are enrolled in the program in Alexander, Caldwell, Davidson, Franklin, Jackson, McDowell, Moore, Stanly, Union, and Wilkes County high schools.

Critique/analysis: Trade and Industrial Education staff members are continuously searching for new funds to supplement existing solar energy programs and to provide seed money for additional programs. Rollins added, "We feel this is one of the most efficient ways to invest funds to promote energy awareness and conservation."



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	NC
Project Name	Wind on a Shoestring Budget

As part of an expanding Industrial Arts and Technology Curriculum at Elizabeth City State University, the students in Advanced Power Technology developed and built a low-cost wind-powered machine. The goal of the project was to use at least 90 percent scrap materials and still develop a functioning windmill that would operate under local conditions where the average wind speed is 12 to 15 miles per hour. If the windmill could be built and could operate successfully, the Electricity/Electronics classes agreed to develop an electrical-generating and storage system for the mill.

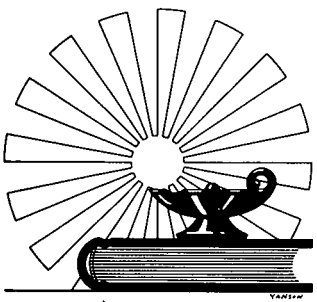
To make the project even more challenging, the class decided to use technology simple enough for the average teacher, homeowner, or inventor to comprehend. They also made sure that construction would require little more than welding rods, and nuts and bolts assembly.

The class designed a Savonius rotor system: a vertical axis wind machine that spins no matter which direction the wind is blowing. The machine is made of a rear automobile axle and 55-gallon drums located on an abandoned basketball hoop post.

The device has been spinning since 1978 without need for adjustment.

Organization	Power & Tech. Class Elizabeth City State University
Address	Elizabeth City, NC 27909
Contact	Scott McCombe
Telephone	(919) 335-0557

Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	NC
Project Name	The Hobitat

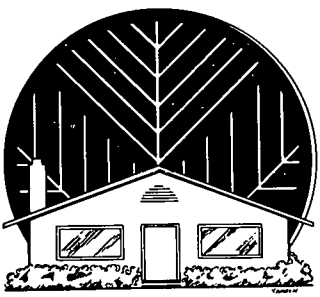
"The Hobitat" is a "solar assisted home that minimizes electrical energy usage and maximizes solar energy." Located in mountainous Asheville, where the possible percentage of annual sunshine averages 60 percent, the 1900 square foot building exposes only its south wall to the atmosphere.

Natural light is provided to both the north and the south sectors of the interior. Large, sliding glass doors in the south wall admit light directly to the sleeping and living spaces while a 48 foot long skylight illuminates the rear or northern portion of the interior. Both areas of glazing are designed to provide passive solar gain during the winter; overhangs prevent unwanted solar gain during warmer periods.

A slab floor, a roof of 4-foot wide precast concrete units, and perimeter and bearing walls of reinforced concrete blocks are the main structural components. Interest is added by the surface treatment and color (light gold) of the blocks. The earth-covered portions of the house are completely insulated, waterproofed, and protected with a positive drainage material.

Critique/analysis: The architect gave as much attention to the psychological as to the technical aspects of his design. He was aware that some people immediately equate "underground" with "dark and cheerless." This in mind, he thought out and deliberately "used natural light and space to try and overcome this real concern of people."

Organization	Dick Webster, AIA
Address	663 Merrimon Ave. Asheville, NC 28804
Contact	Dick Webster
Telephone	(704) 254-1584
Funded By	Private
Cost	n/a
Congressional District	XI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	NC
Project Name	Passive Solar Community

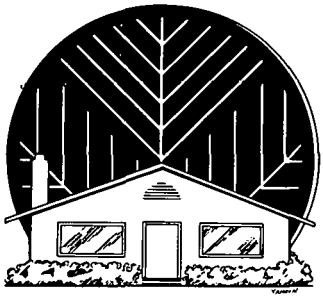
This 31-acre tract of land was the site of a family-owned saw mill from 1880 to 1973. It was then purchased for the construction of a solar housing community.

Utilities and roads are 80 percent complete for the building sites with a projected completion date of March, 1980.

Planned for the subdivision are thirty-six homes on lots ranging from .7 to 1.2 acres. These homes will measure 2,000 to 2,500 square feet, and they will be heated by a passive solar system that incorporates a green house for the heat storage mechanism.

A model solar home will be open for public inspection by July of 1980.

Organization	Circadian Development and Construction, Inc.
Address	P.O. Box 8646 Forest Hills Sta. Durham, NC 27707
Contact	Clarence Ledbetter
Telephone	(919) 489-7706
Funded By	Private
Cost	$100,000 per home
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Industrial
State	NC
Project Name	Sol-Cycle Process

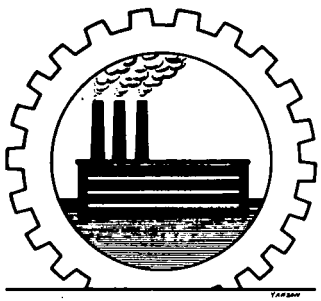
Sol-Cycle Process is a unique solar energy-assisted manufacturing system designed to produce asphalt expansion joints for concrete construction. In this process, the petroleum solvent used in the saturation process is recovered and recycled.

Dr. Ben Edwards, Chief Chemist, states that this process departs from traditional methods used by the chemical and specialties manufacturers in making supplies for the construction industry. The product, Flex Joint, is manufactured by saturating sheets of fiber board with a solution of asphalt in naptha, then evaporating the naphta to leave 35 to 40 percent by weight asphalt in the product. When oil-fired boilers are used in the heating process, it takes up to three weeks for the fiber to become "cured." The Sol-Cycle Process, in contrast, provides for the recovery and re-use of the impregnating solvent and provides a finished product within 24 hours.

The working solution consists of approximately 10,000 gallons that must be maintained at 180 degrees F (82 degrees C). Heat from an array of solar collector panels is transferred to the solution by water circulated through a heat exchanger. The asphalt solution serves as the thermal storage medium. The new process is entirely automated and operated from a programmed electronic computer.

.tique/analysis: President Rauchfuss states
it the new Sol-Cycle Process will save 10,000
gallons per year in heating fuel and 100,000 gallons a year in solvents.

Organization	Old North Manufacturing Company
Address	802 Old North Rd. N.W. P.O. Box 598 Lenoir, NC 28645
Contact	Dr. Ben Edwards
Telephone	(704) 754-5690
Funded By	North Carolina Energy Institute
Cost	$35,600
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	NC
Project Name	Solar Sludge-drying Facility

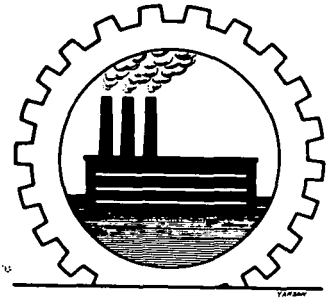
A solar energy application to enhance evaporation in a test solar heat-bed was completed at the Homing Creek Wastewater Management Facility of the City of Wilson. The process provides an alternative to the more expensive method of centrifuging.

A solar energy collection system heats the bed and rapidly increases evaporation. The dry sludge is then underlaid with pipes that carry water (secondary fluid) heated by a solution of ethylene glycol (primary fluid). The ethylene glycol is heated in the 200 square feet or solar panels to approximately 170 to 200 degrees F. The solar test bed was also covered by a greenhouse-type enclosure that uses direct sunlight and protects the bed from inclement weather. The physical and biological data of this study will be used to establish estimates for modified sludge drying beds.

Critique/analysis: The study shows that the solar system is economically feasible, and may be more cost-efficient than natural gas, fuel oil or electricity. The system, which has a 25-year life span, reportedly poses no environmental hazards.

Organization	City of Wilson & Atlantic Christian College
Address	2107 Somerset Drive Wilson, NC 27893
Contact	Dr. Ho Keun Kim
Telephone	(919) 237-3161 ext. 225

Funded By	North Carolina Energy Institute
Cost	$22,600
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	NC
Project Name	Low Income Energy Conservation and Solar Workshops
Organization	Operation Breakthrough, Inc.
Address	P.O. Box 1470 Durham, NC 27707
Contact	Julia Slebos
Telephone	(919) 682-5712
Funded By	National Center for Appropriate Technology (NCAT)
Cost	$2,617
Congressional District	IV
Compilation Date	February 1980

Operation Breakthrough and the Durham City Schools Community Education Program have sponsored several workshops on energy conservation and solar technologies for low-income residents of Durham. In one workshop covering heat loss and its prevention, participants were taken to a house and shown areas in the house where heat loss had occurred. Instructors then demonstrated how to apply caulking, weather stripping, and plastic window insulation to cut the heat loss.

A number of other workshops, including "Understanding Solar Energy," "How to Keep a Wood-burning Stove in Working Condition," "How to Clean a Chimney," and "How to Build and Maintain a Fire," were held by the two agencies.

The workshops were not well attended because of bad weather. However, a local vocational-technical school videotaped all of the lectures and demonstrations, airing them over the local cable-vision channel. These videotapes are now available for future use in other workshops.

(Information concerning this project was obtained from the National Center for Appropriate Technology.)

Renewable Resources—A National Catalog of Model Projects

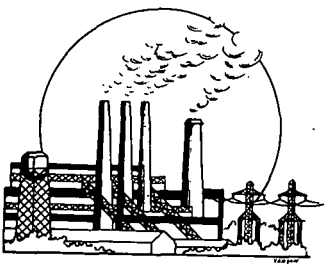
Category	Utility
State	NC
Project Name	Alternative Energy Corporation
Organization	North Carolina Utilities Commission
Address	P.O. Box 991 Raleigh, NC 27601
Contact	Robert Koger, Chairman
Telephone	(919) 733-6110
Funded By	Duke Power Co. Ratepayers
Cost	$1 million
Congressional District	IV
Compilation Date	February 1980

On October 8, 1979, the Duke Power Co. requested a $28 million-per-year rate increase from the North Carolina Public Utilities Commission. At public hearings held across the state, considerable concern was expressed over the cost of building new power generation facilities.

However, the Commission found that construction costs for new coal or nuclear units have rapidly increased in past years. In fact, construction costs for Duke generating plants 10 years ago averaged around $150/KW, while plants now under design for the 1990s are estimated to cost $1,500/KW capacity.

As a result of its findings, the Commission set aside $1 million of revenues Duke Power would receive under the request, and stipulated those funds be used to establish a corporation that would explore ways to expand the use of alternative energy. The idea was to reduce electric consumption through use of economically competitive, reliable, and environmentally sound renewable resources.

Commission members have said that similar funds would be designated in future rate hikes for Carolina Power & Light Co., Virginia Electric & Power Co., and Nanthahalas Electric & Power Co. This proposal is still pending. At further hearings, there are several key issues that must be worked out. One is whether the corporation's governing board should be dominated by utility or non-utility members. Duke Power Co. proposed an 11-member board with six members from six electricity providers. Several public interest groups in the state have threatened to take court action if utilities dominate the board. Gov. James Hunt, Jr. is in favor of Duke's proposal.



Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	NC
Project Name	Wind Power for Boone, NC

Organization	Blue Ridge Electric Membership Cooperative
Address	Boone, NC 28607
Contact	Jerry Marretz Bob Bumgarner
Telephone	(704) 264-8894

Funded By	U.S Department of Energy (formally ERDA)
Cost	$6,000,000
Congressional District	X
Compilation Date	February 1980

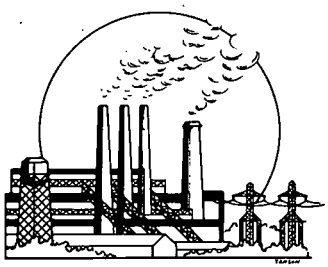
On July 11, 1979, the Blue Ridge Electric Membership Cooperative started up a 2000 kilowatt windmill, and began feeding the electricity into the power grid of the Blue Ridge Electric distribution system. The generator, with blades as long as the wingspan of a Boeing 747, produces enough electricy to power 500 homes. The windmill is the largest and most expensive windmill ever constructed.

The project is the culmination of national efforts to build large-scale wind generators. In 1973, the Federal Energy Research and Development Administration (ERDA) decided to research and develop a large wind-turbine generator with the potential to generate electrical power at costs competitive with those of current and future energy sources. The system was designed to produce output power at a quantity similar to to that of a typical utility system.

The program was initiated when a 100-KW demonstraton wind generator was built at NASA's Lewis Research Center in Plumbrook, Ohio. ERDA then asked utilities across the country to propose sites for future large wind generators. Seventy utilities responded, and 17 sites were selected for further study. After the data collected at the 17 sites were examined, three locations were selected for the second generation of wind generators. Wind generators of 200-KW capacity were installed at Clayton, New Mexico; k Island, Rhode Island; and Culebra Island, to Rico.

Boone was selected by the Department of Energy as the site for the largest generator in this research project. The decision was based in part upon the high visibility of the site and the large number of tourists that will be able to view the project.

The project was a joint effort of numerous groups. General Electric Company, under the

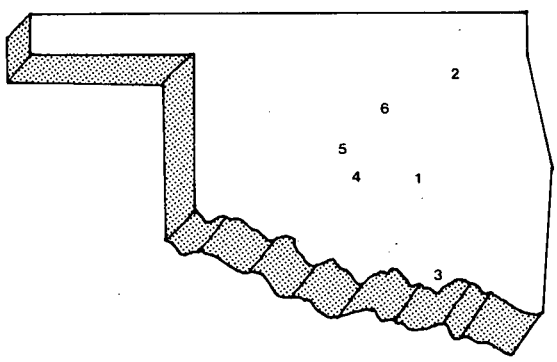


technical management of the Cleveland-based Lewis Research Center of the National Aeronautics and Spacc Administration (NASA), designed and constructed the wind turbine. The Boeing Engineering Company of Seattle, Washington, built the blades. The County of Watauga leased the site to Blue Ridge Electric for the duration of the project.

Critique/analysis: The total cost of the project is estimated to be $6 million--or a cost of $12,000 per home served.

OKLAHOMA

1. Ada
2. Chelsea
3. Hugo
4. Norman
5. Oklahoma City
6. Stillwater



OKLAHOMA

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Category	Agricultural
State	OK
Project Name	Solar Peanut Dryer

Professor Robert Clary has experimented with a flat plate solar collector system, utilizing ethylene glycol as a heat exchange medium, to dry peanuts. To increase the efficiency of the collector, Clary modified the flat plate into a matrix similar to an air conditioner filter. The result was a 50 percent increase in efficiency.

However, a large number of collectors are required to dry a load of peanuts, making the capital costs currently non-competitive with natural gas. Clary estimates that the bottom price for building a solar collector capable of providing 1800 Btu daily is $8-$10 per foot.

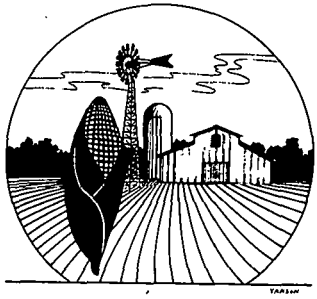
As Clary puts it, "that won't dry many peanuts."

Clary's solar collector models vary size from 32 to 500 square feet. A typical peanut operation would require at least 2000-25000 square feet of collector area, at a capital investment of $25,000.

Presently, Clary uses 1,500 gallon tanks for thermal storage. He foresees using small ponds to store solar heat for up to one month. He hopes this would reduce the size of the collector area needed for the drying system.

Organization	Oklahoma State University
Address	Agriculture Engineering Dept. 214 Ag. Hall Stillwater, OK 74074
Contact	Robert Clary
Telephone	n/a

Funded By	$60,000 grant from DOE
Cost	n/a
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	OK
Project Name	Solar Homes

Wade Fathree, builder, has combined his talents with architect John Robison to design and build wholistic, passive solar homes, duplexes, and commercial buildings. The Robison/Fathree team has put together twenty design packages for clients and are glad to tailor architectual drawings. Waste recovery systems, agriculture, and solar appliances are options that can be incorporated into the design.

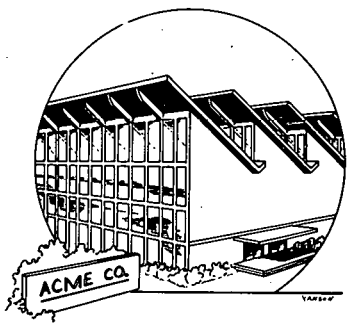
Robinson has been designing passive solar homes for several years. Until recently, his clients had difficulty getting loans and builders to execute the plans.

Fathree is interested in combining sun and earth technologies, and built his own passive solar partially underground home. The north and west walls of the Fathree home are built into the hillside, with 12 inches of topsoil on the roof. The 1,325 square-foot two-bedroom design capitalizes on cement walls and slab floor, covered with decorative Mexican tile, for its thermal mass storage. Electric baseboard heating acts as back-up to the passive solar wall. An energy efficient fireplace, built a foot lower than floor level, warms the living area. Rather than wasting hot air up the chimney, the fireplace allows heat to escape through holes in the top of the hollow firebox.

Retrofitting, commercial applications and in-fill development are some of the projects the team will be working on in the future. They welcome inquiries from builders and designers.

Organization	John Robison Wade Fathree
Address	2927 Paseo Oklahoma City, OK 73103
Contact	John Robison, Wade Fathree, builder
Telephone	(405) 524-4544

Funded By	Fees
Cost	$40/sq. ft. new construction
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	OK
Project Name	Chelsea School Solar Lab

In 1976-77, Paula Baines, science coordinator for Chelsea Schools, initiated a solar lab for K-6th students to experiment with wind, solar, water and weather. The two-year program was funded with Title IV-C ESEA money and was the first federally funded solar grant for a public school system in Oklahoma. Expanding to K-12th in its second year, the program has had 700 student participants.

The central building is a 10x30' solar greenhouse built by a high school construction class. The greenhouse contains a gravel floor, white walls, and eight heat reflectors to diffuse heat throughout. Four solar flat-plate panels heat the greenhouse. A 1,000 gallon water storage tank acts as the heat storehouse. A coiled heat exchanger absorbs warmth from the water, heating the surrouding air. That air is then blown into the greenhouse. Two wood stoves act as back-up heating systems.

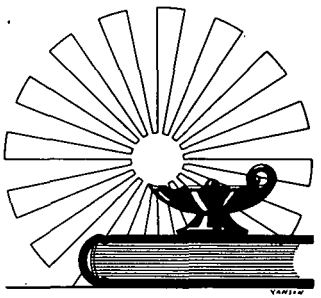
A windmill provides the electricity for the greenhouse and for the fan used in conjunction with the heater. Four large batteries store excess power from the wind generator.

A 20-foot windmill assembled by special education students pumps water from a well drilled by a local Chelsea employee. A weather station inside the school allows students to record wind velocity and other climatic data.

C ue/analysis: Mrs. Baines left the Chelsea schools in 1978. The program lay dormant for a year. Now, Tom Cameron, project director, has assigned three science teachers to act as facilitators, designing curriculum units dealing with solar, wind, weather, and water.

Organization	Chelsea Middle School
Address	204 E. 4th Street Chelsea, OK 74016
Contact	Tom Cameron
Telephone	(918) 789-2366

Funded By	Title IV-C Education Funds
Cost	$69,103 1976-present $24,000 requested for 1979-80
Congressional District	II
Compilation Date	February 1980



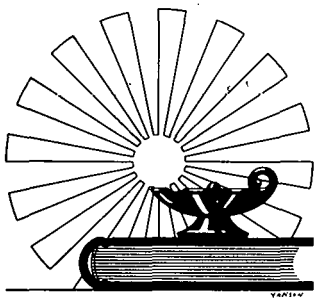
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	OK
Project Name	Neighborhood Development and Conservatic Center
Organization	Neighborhood Development and Conservation Center
Address	525 N.W. 13th Street Oklahoma City, OK 73103
Contact	Jean Langendorf
Telephone	(405) 232-4626
Funded By	Community Development Block Grant
Cost	n/a
Congressional District	v
Compilation Date	February 1980

The Neighborhood Development and Conservation Center (NDCC) was formed to provide technical assistance and information to neighboorhood groups. Twice a month John Robison, architect, lectures for NDCC on topics including insulation and solar energy with an emphasis on passive applications. The primary audience consists of people who belong to some 150 neighborhood associations in Oklahoma City, but the public is welcome.

Funded with Community Development Block Grant money administered by Oklahoma City, NDCC has about a dozen paid staff members and 40 professionals who volunteer time to the advisory board. The NDCC maintains Library materials on energy, including solar and conservation. It distributes a monthly newsletter to its members with energy conservation tips.

In November 1978, NDCC purchased the materials used in building a solar greenhouse on a low-income residence in Oklahoma City. In the future, NDCC will participate in a $22,000 grant for solarizing a CAP home in Oklahoma City. The project will include trombe walls, greenhouse, sun grabber and other conservation measures.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	OK
Project Name	OSU Geothermal Research

An earth-coil system heat exchanger, augmented by solar panels, was devised by Jim Bose, director of Oklahoma State University School of Technology, C.W. Ledbetter, owner-operator of a plumbing and heating business, and James Partin, a builder in Stillwater, Oklahoma.

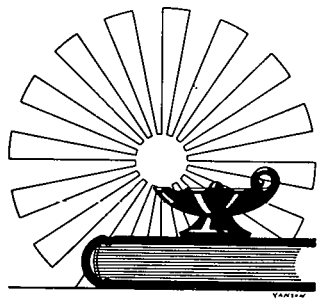
In the test system at OSU, 1000 feet of uninsulated 4-inch pipe is buried four feet underground. A small centrifugal pump circulates water through this coil and the 1000 gallon water storage tank. In summer, warm water from the pump is cooled by circulating it underground during the day. At night, this water flows through the solar collectors giving up heat to the cooler night air. In winter, water flows through the collectors during the day absorbing heat. After sunset, it circulates underground collecting geothermal heat. Hot water is provided in summer by utilizing the waste heat from the pump's cooling cycle. No matter how hot or cold the surface temperatures get, the water temperature in the system only varies from 42-72 degrees.

Supplemental solar panels collect the sun's heat in winter and combine with the geothermal unit to provide space heating. Sixty residences in the Stillwater area use this earth coil. A commercial unit is under construction and will fit even in tightly developed areas.

The earth coil costs approximately $2,500 more than a conventional heat pump. The operat- ost is one-third that of a conventional all- ric unit.

Organization	Oklahoma State Univ. School of Technology
Address	Stillwater, OK 74078
Contact	J.E. Bose, PhD, P.E.
Telephone	(405) 624-5638

Funded By	DOE ($100,000 grant)
Cost	Residential unit $5,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	OK
Project Name	Sunspace, Inc.

Sunspace, Inc. is a non-profit educational organization that teaches individuals and groups how to construct passive solar greenhouses, thermo siphoning and breadbox-type solar water heaters. Sunspace provides workshop participants with "hands on" experience in building the solar units. Approximately 150 people have been trained in the greenhouse and solar water heater workshops. Bill Zoellick, chief consultant, figures 400-500 others have attended his seminars.

In addition, the group helps other non-profit organizations find funding for solar projects.

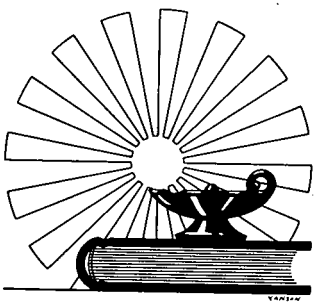
Sunspace has conducted workshops for community action programs and a rural electric co-op. A two-level, 12' x 14' solar greenhouse in Oklahoma City has been in use for over a year. An 8' x 38' greenhouse in Broken Arrow stayed above 40 degrees at night this past winter without supplemental heat, while heating the southern third of a large ranch house by day. Sunspace has also designed a successful, inexpensive direct gain water heater. This type of water heater can be constructed by beginners. It is in use in Little Axe, Marietta, and Ada, Oklahoma, and more are on the way.

Over the next six months, Sunspace will be working with the Community Action Program of Oklahoma City to build a neighborhood energy information center. Funding is through DOE.

Sunspace provides free consulting to individuals by phone. Workshops, however, must be sponsored by an agency, rather than an individual who wants a greenhouse. Says Zoellick, "When an agency is the contractor, the goal is education of a group of people in the application of solar energy. The end product is a greenhou and an educational experience."

Organization	Sunspace, Inc.
Address	P.O. Box 1792 Ada, OK 74820
Contact	Bill Zoellick
Telephone	(405) 332-0106

Funded By	Fees
Cost	Greenhouse Workshop Fee: $750 - $1,000 Materials: $1,000-up Water Heater Workshop Fee: $500 Materials: $500
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	OK
Project Name	Wind-powered Washer

Organization	Bruce Johnson
Address	7605 N. Post Rd. Spencer, OK 73084
Contact	Bruce Johnson
Telephone	(405) 771-3551

Funded By	Bruce Johnson
Cost	n/a
Congressional District	V
Compilation Date	February 1980

Bruce Johnson owns a washing machine run by wind power.

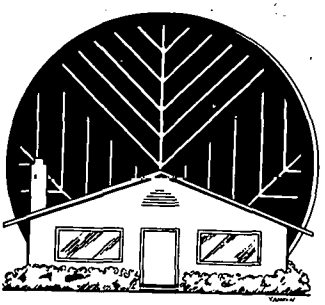
Johnson hooked the 1938-40 Maytag "ringer" up to his 8-foot Aermotor windmill after saving the machine from a certain trip to the junkyard. In order to achieve full agitation, Johnson doubled the stroke on the Aermotor through a series of pulleys. His solar-powered clothes dryer, a line of rope 20 feet long, is conveniently located near the wind washer.

"It works just fine. Really cleans the clothes. But, you've got to plan ahead for a windy day," Johnson says.

The Aermotor head Johnson acquired from a farmer for $25. The tower he constructed of materials he gleaned from the junk pile. The washing machine was free.

The windmill also pumps water for Johnson's water tank; and he's considering hooking up his saw to split wood and to power the air compressor for filling the tires on his propane-propelled truck. The hot water for the clothes washer comes from a bread-box type solar heater.

Johnson, who built his own home on his five acre plot, uses solar energy whenever possible. He also recycles materials. His passive solar h[illegible]as built entirely with recycled materials f[illegible]uplexes he tore down. Johnson cooks in a s[illegible]oven on sunny days. He has a wood stove for cooking and another for heating his 20'x20' house. He uses a Koolatron unit for refrigeration. His shower and toilet are separate, but both are outside the house. Electricity for lights, radio and a few power tools is provided by a 12-volt windgenerator.



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	OK
Project Name	Calorific Recovery Anaerobic Process

Organization	Thermonetics
Address	260 E., First National Center, Oklahoma City, OK 73102
Contact	Ron James, Marketing Director
Telephone	(405) 232-3401 (405) 232-4230

Funded By	n/a
Cost	$4 million
Congressional District	V, VI
Compilation Date	February 1980

Thermonetics produces pipeline quality methane gas from 700 tons/day of Oklahoma manure. Thermonetics runs their own feedlot with some 12,000 head capacity. Three other feedlots sell manure to the plant bringing total livestock numbers to 129,000. Their Calorific Recovery Anaerobic Process (CRAP) plant, located nine miles from Guymon, produces a cattle fodder, and a soil conditioner as byproducts of the methane process.

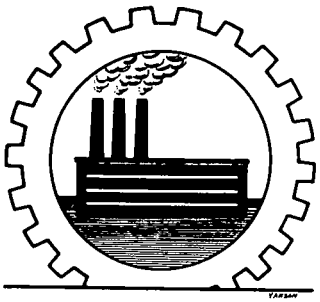
The CRAP bio-conversion is similar to that in sewage treatment plants, mixing hot water with manure and forming a thick slurry. The slurry is piped into anaerobic reactors where bacteria break down the manure into methane gas. The methane flows from the reactors to the pipeline for delivery. Methane can utilize the same pipelines as natural gas making use of existing systems.

Critique/analysis: Originally when the CRAP plant opened in 1977, the manure gas production was projected to heat 3,500 homes in the Chicago area. Several problems ensued and the plant could not process enough gas to meet expectations.

Ron James of Thermonetics says that the plant reactors are powered by the slurry produced from the animal droppings, but that no deliveries are being made to the Chicago area.

James says, "We are confident that we can eliminate contaminants such as rock and dirt and other extraneous material from the manure. Those particles clogged our pipelines. Though our process is still in the developmental stages, we are confident of our ability to make a good slurry." He could not comment on a target date for pipeline delivery to resume.

Thermonetics hopes to open methane plants in Texas, Kansas, and the West Coast.



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	OK
Project Name	Solar Spray Paint Booth

A new plant in Oklahoma City is the site of General Motors' first experiment with solar energy to power a paint spray booth. A 917 ft^2 solar array is designed to supply approximately 20 percent of the heating and cooling needs of the booth, which is used for the painting of steering columns.

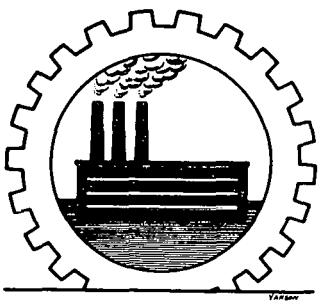
In an automobile assembly operation, the spray painting facilities are major energy consumers due to the large volumes of "once through" air consumed by the process.

Although the solar application does not provide an attractive payback at the present time, valuable engineering information may be gained and evaluated for future production applications.

The Oklahoma City GM plant has a larger 8404 ft^2 collector array that provides 79 percent of the heating for the administration building and 42 percent of the energy demand for the cafeteria air conditioning. In addition, the system provides domestic hot water for the plant administration building.

Organization	General Motors Corp.
Address	7447 S.E. 74th Street Oklahoma City, OK 73135
Contact	Carole Williams
Telephone	(405) 733-6011

Funded By	n/a
Cost	n/a
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	OK
Project Name	Solar Cost Analysis

The House Joint Resolution #1013 dated December 8, 1976, directed all state agencies to perform a study measuring the cost of converting a solar installation for the agency's heating and cooling. Sponsored by Victor Wickersham this resolution also directed all new building proposals to include research on solar energy as a power source for climatic control. If alternatives were not found feasible, the resolution required state agencies to turn to solar as a supplemental source of power.

Critique/analysis: The state Department of Energy was charged with receiving copies of each study from the various state agencies.

Organization	Oklahoma House
Address	State Capitol Building Oklahoma City, OK 73105
Contact	Secretary of State
Telephone	n/a
Funded By	n/a
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	OK
Project Name	Tax Credits

State Law #1322, authored by David Craighead, allows tax credit up to $2,000 or 25 percent of the cost of solarizing buildings for heating and cooling purposes. However, it specifically states that applicable items must involve electrical and/or mechanical devices, therefore excluding passive.

The tax credit can be claimed only once on state income tax returns and an itemized accounting of the costs, with possible on-site inspection of the installation, is required. The act applies to all taxable years beginning December 1977 and ending December 1987.

One important portion prohibits public utilizes from increasing rates because solar devices are installed in a building.

Organization	Oklahoma House
Address	State Capitol Bldg. Oklahoma City, OK 73105
Contact	Secretary of State
Telephone	n/a
Funded By	n/a
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	OK
Project Name	CAP Training Program

Organization	Little Dixie C...ity Action Agency
Address	207 East Jackson St. Hugo, OK 74743
Contact	Fred Tucker
Telephone	(405) 326-6441

Funded By	NCAT (National Center for Appropriate Tech.), Dept. of Labor, CSA HUD cycle 4 grant, FHA
Cost	n/a
Congressional District	III
Compilation Date	February 1980

Little Dixie CAP is administering a six month solar training program in the Hugo area. With the help of Claude Lawrence of Antlers, Oklahoma Fred Tucker educates Title 6 workers in a solar curriculum, giving them two hours a day classroom instruction and six hours a day experience solarizing low-income homes. The first class of eight graduated from the training center in October.

This program, one of 15 made possible by a grant jointly sponsored by Community Services Administration and CETA, improves employment prospects for these previously untrained workers. Construction techniques are kept simple and the emphasis is on utilizing available materials and equipment. This curbs expense of collectors and other items.

With a $4,800 grant from NCAT, Little Dixie developed and installed six low-cost, but efficient, domestic solar hot water heaters.

HUD Cycle 4 monies supplied five solar space heating and hot water systems on "self-help" homes. Each individual involved with the new HUD homes gave 700 hours of labor to participate in the project. These integrated solar systems cost $8,000-$10,000 and trained low-income people in applications of solar technology. The Farmers Home Administration is financing mortgages for more of these self-help homes.

Claude Lawrence builds flat plate collectors using locally trained CETA labor for about $150 per collector. This 24 square foot panel performed well under tests conducted at the University of Tulsa. Lawrence couples two panels with an 80 gallon storage tank for a total cost of $600 and heats enough hot water for a household. The only expensive tool used in making the collector is a sheet metal brake which forms the aluminum collector box. From a salvaged washing machine wringer, Lawrence fashioned a device that flattens one side of 3/8 tubing which facilitates heat transfer from the collector plate.

Renewable Resources—A National Catalog of Model Projects

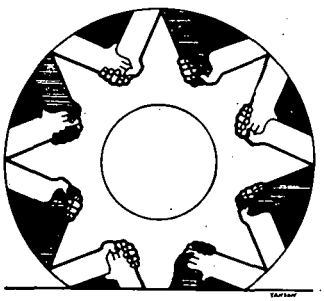
Category	Outreach
State	OK
Project Name	Oklahoma Solar Energy Association

Organization	Oklahoma Solar Energy Association
Address	827 E. Brooks Norman, OK 73071
Contact	Gary Walker, Larry Church
Telephone	(405) 329-4094

Oklahoma Solar Energy Association (OSEA), is a non-profit organization, dedicated to furthering solar energy and solar energy-related arts, sciences and technology. OSEA projects reflect concern for the ecologic, economic, and social well-being of the state. Incorporated in 1977, it evolved as a result of the Oklahoma state plan for energy usage.

The twelve-member Board of Directors meets twice a year, the general membership, currently numbering 176, convenes once a year. Professionals and craftsmen alike participate in the varied programs sponsored by OSEA. This year, the Norman-based group organized an energy audit of homes, several solar home tours, public exhibits, and a heat grabber workshop. During the month of October 1979, OSEA, under the direction of Diane Vanlandingham, will demonstrate several of the member's projects at the Omniplex in Oklahoma City. This is being done to publicize October as the month for International Energy Conservation.

Funded By	Private
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	State
State	OK
Project Name	Solar Asphalt Heater
Organization	Oklahoma Dept. of Transportation
Address	201 N.E. 21st Street Oklahoma City, OK 73105
Contact	Joanne Orr, ODOT
Telephone	(405) 524-2554
Funded By	State of Oklahoma
Cost	$4,829; payback = two years.
Congressional District	V
Compilation Date	February 1980

In April 1977, Oklahoma Department of Transportation installed a solar asphalt heater at their Muskogee Division Headquarters. Prior to the solar installation, the 10,000 gallon asphalt tank was heated with 8,500 gallons of propane at a cost of $2,900 a year.

The cost of the $4,829 system was repaid in two years. In addition, maintenance crews did not need to get up in the middle of the night to fire the propane burner, so labor costs were saved. In 1978, the Muskogee plant used $72 in electricity for the pump and water heater to the system.

Drs. Gerald Parker and John Wiebelt of Oklahoma State University School of Mechanical Engineering designed and supervised construction of the prototype solar asphalt heater. Six solar flat-plate collectors, made of heavy aluminum plate formed around copper tubing, were placed in a fiberglass insulated box. Black paint was used to coat the aluminum absorber plate. Twelve gallons of ethylene glycol was added to the fluid heat-transfer medium to serve as an antifreeze. An electric heater served as back-up for the solar system.

ODOT modified the heater, adding an extra inch of insulating urethane. Finned copper tubing replaced the solid copper coils because the finned type offers more surface area for heat transfer. Asphalt coagulates around the out-take valve. Electric timer-heaters attached near the valve come on right before removal. In high temperature tanks, ODOT is now using evacuator tube collectors in preference to the flat-plate type.

ODOT was first in the country to solarize heater tanks. Six such stations are working across Oklahoma. A 20-minute video tape is available on loan from ODOT.

ODOT is branching their solar application to include solar heat for the Yukon maintenance building of 2,000 square feet. In the summer, the solar system will produce hot water for cleaning trucks.

Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	OK
Project Name	Kirkpatrick Center Photovoltaic System

Organization	Oklahoma Center f... Science and Arts
Address	Kirkpatrick Center 2100 N.E. 52nd Street Oklahoma City, OK 73111
Contact	Peggy McCracken
Telephone	(405) 424-5545

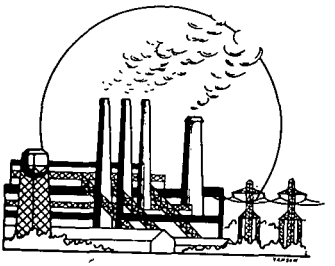
Funded By	DOE
Cost	Planning-$240,000 Construction-$2.5 million
Congressional District	V
Compilation Date	February 1980

The Kirkpatrick Center, a science and arts center visited by thousands each year, has been selected as a site for a solar photovoltaic experiment. The goal of the photovoltaic system is to provide 45-55 percent of the total electric power for the Omniplex where the Kirkpatrick Center is housed. In summer, when the system will produce excess electricity, the extra current will be pumped back into the power line for use by Oklahoma Gas & Electric. If the experience is successful, OG&E will receive electricity during the summer daytime hours concurring with the peak-load time demands. OG&E has worked closely with the Center in providing expertise on rigid safety requirements and proper conversion of the direct current generated by the photovoltaic cells.

The system's first module will produce 150 kwh of power. The original design calls for a 50,000 square foot system for the 1.8 acre roof, consisting of 5,800 two by four foot collector modules, each with 72 photovoltaic cells. The insolation capacity of the polycrystalline silicone panels will be augmented by reflectors.

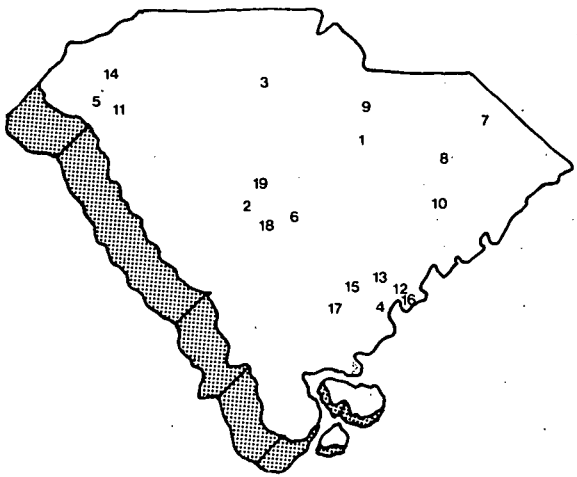
The object of this experiment is to partially heat and cool a large institution by sun power, reduce the cost of commercial manufacture of PV cells, and allow local businesses a chance to establish expertise.

Since the Center is located adjacent to the Oklahoma City Zoo, Dr. Sudduth, director of the Center, hopes battery operated zoo vehicles can be powered from the PV system. He foresees integrating wind and bio-mass projects with the PV design. He says the Oklahoma City Zoo has tons of manure which he hopes the Center can turn into power.



SOUTH CAROLINA

1. Camden
2. Chapin
3. Chester
4. Charleston
5. Clemson
6. Columbia
7. Dillon
8. Florence
9. Kershaw
10. Kingstree
11. La France
12. Mt. Pleasant
13. North Charleston
14. Six Mile
15. Summerville
16. Sullivans Island
17. Walterboro
18. West Columbia
19. Winnsboro



SOUTH CAROLINA

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Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	SC
Project Name	Alcohol Production Facility

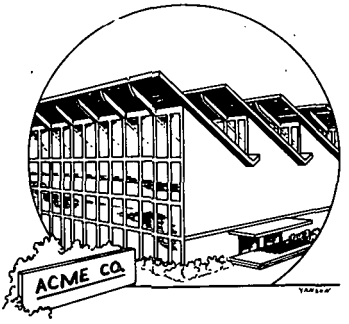
The Carolina Alcohol Corporation is planning to construct an ethyl alcohol production facility in Williamsburg County. The plant, which will employ from six to eight people and measure 30' x 90', will be situated on two acres of land. Production is scheduled to begin in Spring of 1980.

In the first year of production the company expects to produce 600,000 gallons of 200-proof alcohol for use as a liquid fuel. By the second year, production might reach 900,000 gallons.

Company planners predict the plant will boost the depressed local economy, since Williamsburg ranks second among corn-producing counties in the state. The plant will open up a large new surplus grain market for local farmers.

This project has received the first finance loan for an alcohol plant in the country from the Farmer's Home Administration. The cost is expected to be $600,000.

Organization	Carolina Alcohol Corporation
Address	Route 3, Box 249 D Kingstree, SC 29556
Contact	B. J. Gordon
Telephone	(803) 382-8431
Funded By	FmHA
Cost	$600,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	SC
Project Name	Gregory Electric Company Warehouse Retrofit

The Gregory Electric Company has retrofitted two solar systems on a warehouse adjacent to the company's one-story office buildings. The systems, powered by 12 collector panels, are independent of each other: one provides space heat, the other provides hot water.

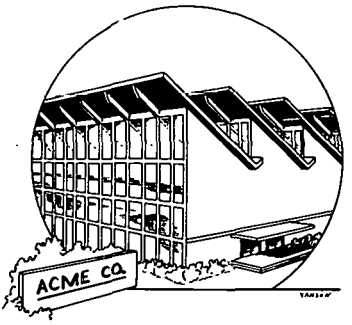
The only difference between the two systems is that the collectors for the hot water service use a water/anti-freeze solution. The heat from the solution is transferred to potable water via an exchanger. Space heating for the office, in contrast, is provided by a water-type collector. Heat from the system is stored in a 1,000-gallon, insulated water tank located above ground. When needed, the heat is transferred to air ducts via a heat exchanger, which is also connected to the building's conventional furnace.

Company President Thomas L. Gregory estimates that it will take nine years to pay back on the $19,500 investment, given a 10 percent annual increase in electric rates. Over 50 percent of the time, the systems meet 73 to 74 percent of the company's space- and water-heating needs.

The systems are expected to function properly without major overhaul for at least 20 years.

(Information on the Gregory Electric Company project was taken from the League of Women Voters' publication, "Rediscovering the Sun", 1979.)

Organization	Gregory Electric Company
Address	2124 College Street Columbia, SC 29205
Contact	Thomas L. Gregory
Telephone	(803) 748-1122
Funded By	Gregory Electric Co.
Cost	$19,500
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	SC
Project Name	The Bio-solar Energy Resource Management Program

The town of Sullivans Island used to send its organic street refuse to the North Charleston dump. This disposal method depended on the heavy use of energy, equipment, time, and money. Now the cost of this operation has been reduced by 50 percent.

The wood, leaves, and grass clippings that used to be trucked off the island are now being taken to an old landfill on the island, where they will be shredded, mixed with sewage sludge, and composted, using earthworms to speed the production of rich humus.

The Bio-solar Energy Resource Management Program, as it is called, is an idea borrowed from the Atlanta City Parks Division, which formerly had problems maintaining lawns on the red clay hills of the city. Adding the humus to red clay, or to the sandy dirt of Sullivans Island, boosts the productivity of the soil.

The project has cost nothing to initiate because of its direct savings to the community. Savings have been realized in municipal waste management, in the use of limited space at the North Charleston landfill, and to the island's people, who now will be able to pick up free loads of humus for their lawns and gardens.

Organization	Town of Sullivans Island
Address	Middle Street Sullivans Island, SC 29482
Contact	Sam Ward
Telephone	(803) 883-3198
Funded By	Town
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	SC
Project Name	Camden Solar Community

A new residential community sprouted in Camden that is committed to the use of solar energy. Two model solar homes are now nearing completion in the 37-parcel development. Lots range from one to nine acres in size.

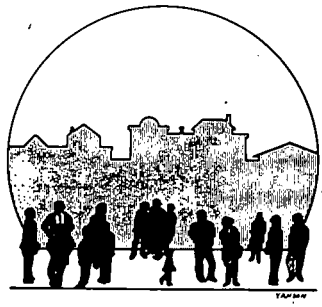
Guided by a planning committee that oversees individual building, the community has adopted a policy that endorses site orientation according to position of the sun, trees and other vegetation.

According to one report, the committee's policy supports planning that "takes advantage of winter sunshine and summer shade."

Those who purchase land in the development receive rebates from the developers if their future homes are designed to include solar energy systems.

(Information on the Camden solar community was made available to the Center through the S.C. Environmental Coalition and the League of Women Voters' publication, "Rediscovering the Sun", 1979.)

Organization	East Kirkwood Land Co., Ltd.
Address	1807 Brevard Pl. Camden, SC 29020
Contact	Edwin D. Child
Telephone	(803) 432-5407
Funded By	Private
Cost	$400,000
Congressional District	V
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	SC
Project Name	Solar Home Research

Organization	Clemson University
Address	Experimental Station Clemson, SC 29631
Contact	A. W. Snell
Telephone	(803) 656-3140

Funded By	Appalachian Regional Commission ($80,000) SC Agri. Experimental Station ($20,000)
Cost	$100,000
Congressional District	III
Compilation Date	February 1980

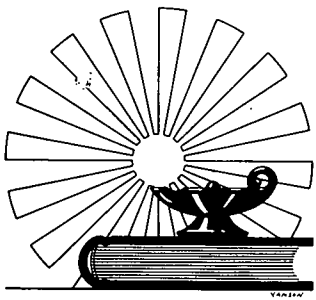
In 1978, Clemson University constructed two experimental solar houses with an Appalachian Regional Commission grant and funds from the South Carolina Agricultural Experiment Station. Designed with low-income homeowners in mind, the solar structures now serve as demonstration models, and are monitored by a sophisticated computer system provided by DOE.

The first residence, designed by Harold Zornig, features a pitched rooftop collector and an attached 248 ft^2 greenhouse that jointly generate energy for space-heating and cooling. Unused heat is stored in 50 tons of crushed rock located beneath the 1,470 ft^2 home. The storage system can supply two to three days' of heat during cloudy periods.

The second structure is sheltered by earth on three sides, and utilizes a variety of energy-saving techniques, including waste-heat retrieval. All energy generated by the 1,800 ft^2 home's clothes dryer, exhaust fans, and other sources of heat is distributed within the house. Excess energy is stored in a rock layer located between the house walls and earthen insulation.

Windows are carefully designed into the home's fourth wall to provide natural lighting. To keep construction costs down, designer Jerry Newman constructed the structure's foundation specially treated plywood panels.

Newman and Zorig, staff members of the USDA-SEA Rural Housing Research Unit at Clemson, estimate that the two model homes will save the occupants between 75 and 80 percent of the yearly heating and cooling costs. The greenhouse is expected to provide over 50 percent of the vegetables consumed yearly by a family of four. Clemson horticulturalists



will weigh the produce harvested in the greenhouse and analyze it to test that proposition.

Critique/analysis: Hundreds of visitors in the fall of 1978 participated in public tours of the homes. Many reportedly made second and third visits, asking questions about construction, costs, and the efficiency of solar technology.

(Information regarding Clemson's research was obtained from the League of Women Voters' publication, "Rediscovering the Sun", 1979.)

Renewable Resources—A National Catalog of Model Projects

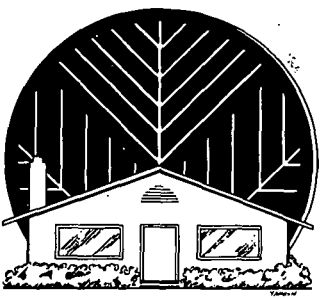
Category	Housing
State	SC
Project Name	Award Winning Passive Residence

A house under construction in North Charleston will have a passively designed sun room with a southern exposure. The design, which won an interagency award from HUD and DOE, includes standard, non-tinted double-paned, siding glass doors to admit sunlight. The heat produced will be stored in a 6" concrete slab floor, insulated with polyurethane foam. Eight 55-gallon drums will be added to the room to store water for additional heat storage. These will be encased in latticework and used as decorative plant stands.

Heat produced in the sun room can be transferred through adjoining doors to the rest of the house or blown through ducts by an electric fan.

Total cost of the house is $54,000. The cost of the sun room itself will run between $7,000 and $7,500, while a standard room of similar size costs about $6,000.

Organization	Curry Lane Realtors
Address	Pepperhill Square Charleston, S.C. 29405
Contact	Ralph McCay
Telephone	(803) 552-5404
Funded By	HUD/DOE
Cost	$7,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Bethea Residence

Hank and Elodie Bethea are adding an active solar space-heating system to their Dillon home. The system, which will be operating for its first season this winter, cost $1,750.

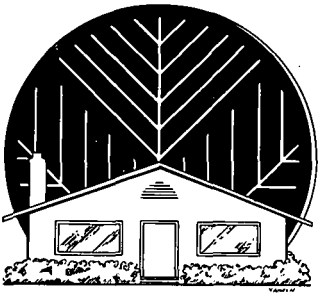
The system consists of an attic collector, with a design similar to one developed at Clemson University, which is connected to the duct system used by the home's heat pump. The collector, which covers the majority of the south-facing roof, is constructed of two sheets of fiberglass, with an air space in between for glazing. Sheets of black plywood create an absorption surface, the back of which is insulated.

A fan-powered air duct system will take cool air from inside the house to the collector room, where it is heated and returned to the living space inside. A thermostat will control this process. An automatic back-draft damper will prevent cold air in the collector from falling into the house at night. In the summer, two electric fans will be used to shade and vent the collector.

Besides heating the home, the collector will be used to dry food and heat water for domestic uses.

Heat storage has not yet been added to the system, so the Bethea family will continue to use a geothermal heat pump for nighttime and back-up heating.

Organization	Hank and Elodie Bethea
Address	Rt. 2, Box 527, Dillon, SC 29536
Contact	Solar P.I.E.
Telephone	(803) 752-2141
Funded By	Private
Cost	$1,750
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Brice Home

Organization	Yank and Tanya Brice
Address	Route 2 Chapin, SC 29036
Contact	Yank and Tanya Brice
Telephone	(803) 345-9323

Funded By	Private
Cost	$55,000 for house $ 3,000 for solar System
Congressional District	II
Compilation Date	February 1980

Yank and Tanya Brice's 2200 ft^2 house in Chapin is south-facing and designed for energy efficiency.

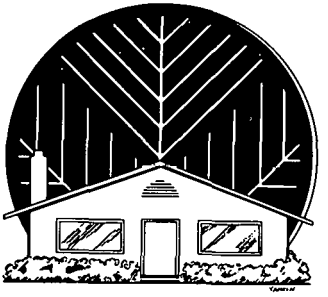
Approximately 100 square feet of south-facing windows allow heat to enter the living space. These windows are protected from the higher summer sun by an overhang and removeable sun louvers. The house is well insulated; removable insulating shutters are used on cold winter nights.

South-facing louvers and a relative lack of east-west windows keep most direct sunlight from entering the house. Natural ventilation is enhanced by an attic fan, which helps cool the house in summer.

Active systems include a solar collector along the ground in front of the south porch. This collector heats air, which can be blown to a rock storage bin. The collector was built on-site by the contractor for under $4.00 per square foot. A separate collector preheats domestic hot water.

Total solar investment in the house was about $3,000. On-site building and ground construction helped to reduce the costs.

During the two winters the house has been occupied, the solar system and fireplace have provided from 60 to 80 percent of Brice's heating needs. Yank reports that even with electric resistance back-up heating, his monthly electric bill went no higher than $35 in the winter of 1978-79.



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Catterton Residence
Organization	Lloyd Catterton
Address	Greenridge Road, Walterboro, SC 29488
Contact	Lloyd Catterton
Telephone	(803) 538-8309
Funded By	Private
Cost	$7,500
Congressional District	I
Compilation Date	February 1980

Lloyd Catterton of Walterboro gets most of his home heating energy from renewable sources. In 1977, Catterton installed a solar heating system that provides both hot water and primary space-heating for his Greenridge Road residence. The system, which cost about $7,500, was privately financed.

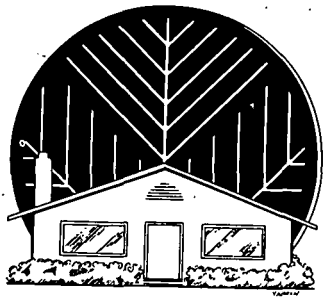
The design involves a set of eight 4' x 16' solar panels, which collect heat in a "trickle flow" process. Pumped water is slowly released over a hot, corrugated aluminum surface inside the collector.

The heat is stored in a 1,600-gallon tank below the house which is surrounded by 20 tons of rock and insulated by two inches of styrofoam and brickwork. The tank contains a 50-gallon water preheater.

Cool air enters the storage section through a plenum at the bottom, and exits at the top into hot air ducts for space heating. Catterton uses a wood-burning stove as a back-up heating source.

A few problems have cropped up since the system was installed. The most prominent trouble, Catterton says, stemmed from the original installers use of unsuitably thin glass in the panels, which required replacement with thicker panes. During extended periods (three days or more) of cloudy weather liberal use of hot water has tended to tax the space-heating capacity of the storage unit - a problem the owner plans to rectify by installing a by-pass valve.

According to Catterton, the system is generally capable of maintaining a 68 degree temperature in winter.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Christopher Towers Apartments

Organization	Christopher Towers
Address	1805 Devine St., Columbia, SC 29205
Contact	Alfred Yost
Telephone	(803) 787-1184

Funded By	HUD ($189,325) Knights of Columbus ($12,000)
Cost	$201,325
Congressional District	II
Compilation Date	February 1980

The roof of a 16-story apartment building in Columbia supports 162 flat-plate solar collectors. The Christopher Towers project, completed in January of 1979, was designed and installed in a cooperative venture involving Wormser Scientific and Walker Heating and Plumbing, a local company. Funding was provided by the U.S. Department of Housing and Urban Development and by Christopher Towers, a senior citizen's home managed by the Knights of Columbus. Total cost for the project was $201,325.

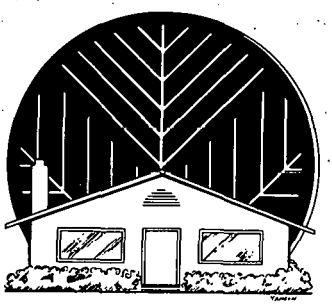
The system supplies hot water for the building's 250 residents and for their laundry facility. It has a 6,000-gallon insulated hot water tank to store hot water for use at night and on cloudy days. Natural gas, the back-up fuel, is used to run clothes dryers, an emergency electrical generator and heating for the 225-unit building.

A 25 percent reduction of gas use has been realized since the system was completed, according to the system's installer.

The installation, which has already received many visitors from colleges, industries, government agencies and community groups, is well worth a visit.

The system is now being duplicated on a building in Wilmington, Delaware by Blaine Tucker's Enertech, Inc.

Critique/analysis: The Towers project is an example of the economic benefits alternative energy can pose for people on fixed incomes. Conventional fuel will no longer represent an increasing expense to the residents. Also, as the price of fuel rises, the system's cost will be paid off that much sooner by the savings it produces.



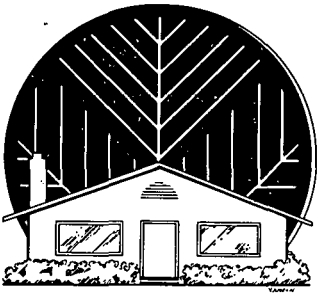
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Gibson Residence

A two-story house at Foxfire Estates in Six Mile has both active and passive solar heating systems. The house, which was completed in 1977 at a total cost of $45,000, is designed to maintain a 68 degree F temperature in winter. It has an attached solar greenhouse and 680 square feet of flat-plate collectors on the roof. Together these provide 60 percent of the space-heating of the 1800 ft^2 home. The collectors also meet 80 percent of domestic hot water needs.

With a maximum normal number of 2200 Btu striking each square foot of collector surface per day, the system can store up to 400,000 Btu in its 40-ton rock storage bin. Back-up heating is provided by a heat-circulating fireplace and an electric heat pump.

Organization	Ed Gibson
Address	Foxfire Estates, Six Mile, SC 29682
Contact	Phil Fevrey
Telephone	(803) 654-1688
Funded By	Private
Cost	$45,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Haynes Residence

Organization	Bill and Betty Haynes
Address	3119 N. Meadowbrook Road Florence, SC 29501
Contact	Bill and Betty Haynes
Telephone	(803) 662-8389

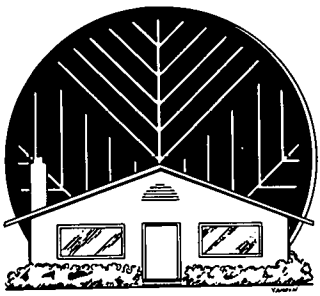
Funded By	Private
Cost	$7,500
Congressional District	VI
Compilation Date	February 1980

Bill Haynes has installed a ten-panel modular unit on his 1,800 ft^2 home north of Florence. Haynes installed the unit in the first months of 1978 at a cost of $7,500, and throughout the winter of 1978-79 it worked well. He claims the system has saved at least 10,000 kilowatt-hours during its first year of operating.

Heat is collected in the panels and then routed to two 120-gallon storage tanks and an 80-gallon tank for the household hot water. During early or late winter the system provides all of the heat the family needs; during the coldest months its electric back-up system is sometimes required.

Because the Haynes are among the few in the Florence area who heat with solar, they have enjoyed considerable publicity. They have been written up in newspapers and in magazines, and during the 1978 Senate campaign, Pug Ravenel posed before their house to make a pro-solar statement to the press. The publicity has begun to lure others to the idea of solar.

However, few others in the Florence area have been able to follow up on the Haynes' example, since lending institutions in the area have refused to appraise solar systems. Moreover, since no appraisals have been done he area, insurers have no way to set a e on a solar system. Many prospective buyers, of course, have suggested that companies simply appraise solar units at sale price, but they have been reportedly reluctant to do even this. Since buyers must therefore be able to pay cash for their systems or do without, most have had to do without.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Howard Residence

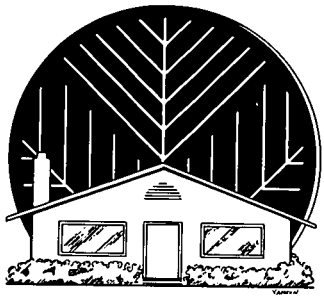
The Langhorne Howard home at 168 Tradd Street in Charleston features an active solar water-heating system. The system provides the 2½-bath house with 100 percent of its domestic hot water, including that used in the family's dishwasher and washing machine (about 30 gallons per day).

The system consists of two 4' x 8' flat-plate collectors, which heat a solution of anti-freeze and distilled water. This solution transfers heat from the collector to a hot water storage tank in the house. An electric heating coil can provide back-up heating. But this unit has been turned off because the Howards have never used it.

The solar unit was installed at a total cost of $2,128 ($1,928 for materials and $200 for installation).

A neighboring home (at 167 Tradd Street) has a nearly identical system.

Organization	Langhorne Howard
Address	168 Tradd Street, Charleston, SC 29401
Contact	Demi Howard Stacy Hull
Telephone	(803) 722-1101
Funded By	Private
Cost	$2,128
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Kroll Home

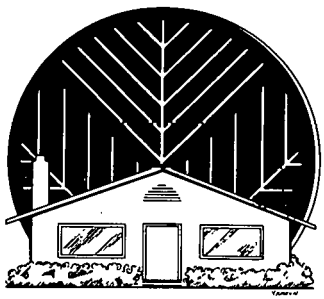
In January of 1978, George Kroll installed an active solar space-heating system on the roof of his Mt. Pleasant home. Kroll, who has a background in heating and air conditioning, designed, installed, and financed the system himself.

The system includes 200 square feet of flat-plate collector surface, which heats air for space heating to 120-125 degrees F. The heated air is blown into a duct system for distribution throughout the house. Sixty percent of the house's daytime heating needs are met by the unit; in winter, Kroll has realized a $60 per month savings on his power bills. However, the system has no storage facilities for heat, and the Kroll home only benefits when the sun is shining.

The rooftop unit is one of a series of alternative energy installations at the Kroll home. Night and back-up heating is provided by a geothermal heat pump, which uses groundwater as a heat source for circulated air.

Another solar collector, located in the backyard, supplies 100 percent of the family's domestic hot water.

Organization	George Kroll
Address	610 Coral Street, Mt. Pleasant, SC 29464
Contact	George Kroll
Telephone	(803) 884-2956
Funded By	Private
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Residential Greenhouse

Two enterprising carpenters attached a 320 ft^2 solar greenhouse to the south side of the late Katherine Gilbert's resident in 1978. It was perhaps the most innovative change the structure has experienced since it served as a Yankee stronghold during the Civil War.

The greenhouse, which contains 484 square feet of glass, is designed to heat 1,500 square feet of the home. Builders Keith Thomson and Robert Pollack erected the structure at a minimal cost, using many recycled materials, including glass and supports from a dismantled commercial greenhouse, and rusted wire fencing for concrete reinforcement.

Thanks to detailed planning, the addition is well positioned to accept winter sunlight. The glass wall is angled at 57 degrees to receive sun rays in late December.

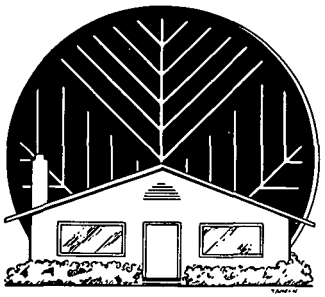
Heat generated in the greenhouse enters the house through open windows high on the addition's back wall. The heat is then captured in water-filled bottles, and the air returns to the greenhouse to begin the cycle anew. In the summer the process is reversed, cooling and dehumidifying the house.

Vegetable cultivation is an important function of the greenhouse. The 10' x 32' greenhouse area is covered by an extremely rich topsoil reportedly 3 feet in depth.

(Information regarding the Gilbert residence was obtained from the League of Women Voters' publication, "Rediscovering the Sun", 1979.)

Organization	South Carolina Environmental Coalition
Address	P.O. Box 5761 1226 Bull Street Columbia, S.C. 29250
Contact	Bill Frye Keith Thomson
Telephone	(803) 799-0321

Funded By	Private
Cost	$1,200
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Senterfeit Residence

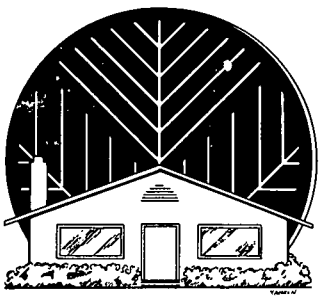
Mike and Kathy Senterfeit are building an 1800 ft^2 direct-gain passive solar house in West Columbia. The design of the house is modeled on the Karen Terry home in Sante Fe, NM. It is being modified by Columbia Architect Dick Lamar to adapt it to the local climate.

Sunlight will enter the living space during winter through approximately 400 square feet of south-facing windows and a clerestory. The sun's heat will be stored in a concrete floor and concrete masonry walls. Excess heat can be drawn by fans into a storage area under the slab floor.

Back-up heating will be provided by an efficient wood-burning stove, while the passive solar design of the house is expected to meet 70 percent of the Senterfeit's space-heating needs. The owners are building the home themselves. Reportedly, construction is thus proceeding slowly.

Domestic hot water will be pre-heated in a tank mounted under a skylight on reflector panels. This is less costly, if less efficient, than using a separate flat-plate collector and storage tank.

Organization	Mike & Kathy Senterfeit
Address	389 Watling Road, West Columbia, SC 29169
Contact	Mike & Kathy Senterfeit
Telephone	(803) 791-4947
Funded By	Private
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

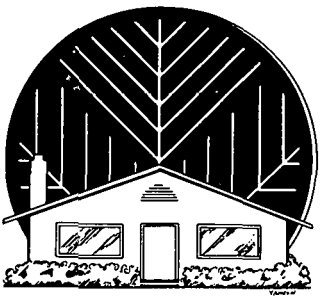
Category	Housing
State	SC
Project Name	Smith Residence

A number of overlapping solar systems in Ed and Leeann Smith's house in Winnsboro are designed to meet 80 percent of their space-heating and hot water needs. The 2,100 ft^2 living space collects solar heat passively through 120 square feet of south-facing windows and a 100 ft^2 greenhouse. A concrete slab helps store this heat.

The active solar system consists of 400 square feet of site-built air collectors and a rock storage bin. Domestic hot water is preheated by a tank mounted on reflector panels and located under a skylight.

The need for summer cooling is reduced by window placement. Natural ventilation is provided by a high-entry stairway and augmented by a fan exhaust system. Mechanical cooling and auxiliary heat are supplied by an electric heat pump.

Organization	Ed and Leeann Smith
Address	Rt. 3, Box 475, Winnsboro, SC 29180
Contact	Dick Lamar
Telephone	(803) 799-7495
Funded By	Private
Cost	$65,000
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Snee Farm House

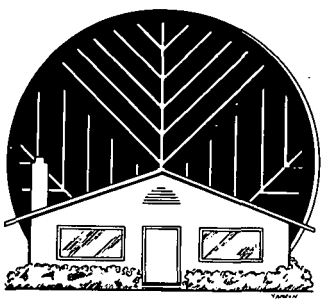
Van Robinson has built a home that meets 75 percent of its space-heating requirements with an active solar installation. The 2400 ft^2 house at Snee Farm has 800 square feet of flat-plate collector surface on the roof, which generates heat for a 100-ton rock-storage bin underground. Heat storage is adequate to heat the house for seven or eight consecutive sunless winter days.

An air-to-water geothermal heat pump is used for back-up heating in winter, as well as for air conditioning in the summer. Robinson has also installed a wood-burning stove that uses outside air for combustion, therefore cutting down on drafts associated with the use of standard stoves.

Robinson says the surface is greater than he needs for his use. The system, which was designed and built by Richard Blews, cost him about $5,000. He is satisfied with his unit and says that for reasons of cost and simplicity he would never consider building anything other than a solar home. "But," he cautions, "you have to get involved with it."

Robinson plans to build a solar-heated greenhouse for his nursery business soon.

Organization	Snee Farm
Address	Law Lane Mt. Pleasant, SC 29464
Contact	Van Robinson
Telephone	(803) 884-6331
Funded By	Private
Cost	$5,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	SC
Project Name	Timmons Residence

Organization	Jim and Beverly Timmons
Address	308 W. Church Street, Kershaw, SC 29607
Contact	Jim and Beverly Timmons
Telephone	(803) 475-6767

Funded By	Private
Cost	
Congressional District	V
Compilation Date	February 1980

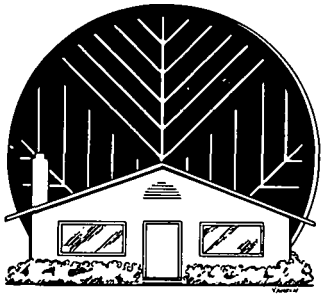
Jim and Beverly Timmons of 308 W. Church Street in Kershaw have recently completed a 2200 sq. ft. home that makes ample use of passive and active solar design.

The house includes a 300 ft^2 sun room with a southern exposure. Living spaces in the house are oriented around the sun room, with most doors and windows opening into it. The room itself acts as a solar collector and as a temperature-and infiltration-buffer between the living spaces and the outside.

The sun room has almost 400 square feet of glass in its walls and roof. The room's concrete floor and the back of the home's fireplace heat up as sunlight strikes their surfaces. These masses then radiate heat slowly, keeping temperatures in the house from dropping low at night. Extra solar heat can be pulled to a remote rock heat-storage bin by a thermostatically controlled fan.

Other passive features of the house include maximum use of summer shading and breezes (to keep cooling needs to a minimum), and a domestic hot water preheater (which consists of a black storage tank mounted on reflector panels in the upper part of the sun room).

The solar system will meet an estimated 65 percent of the home's heating requirements during the first winter of operation (1979-80). Back-up heating and cooling will be handled by a standard heat pump.



Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	SC
Project Name	Solarized Riegel Textile Corporation
Organization	La France Industries Division of Riegel Textile Corporation
Address	La France, SC 29656
Contact	Mike Drummond Plant Engineer
Telephone	(803) 271-8270
Funded By	DOE, Riegel Textile Corporation
Cost	$300,000
Congressional District	III
Compilation Date	February 1980

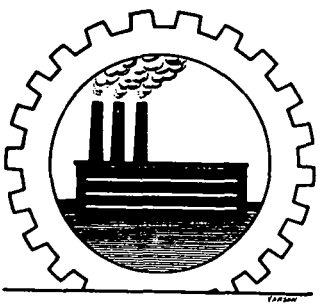
The new La France facility of the Riegel Textile Corporation is a large investment in renewable energy technology. Solar energy supplies this mill with 50 percent of its dyeing process heat in mid-winter and 80 percent of its spring and summer requirements for 190 degree F water. The system consists of 4,000 high-temperature, evacuated-tube solar collectors. These are mounted on 396 panels at a 30 degree angle on a south-facing hill.

The tubes consist of two glass cylinders with an air space between them, which is sealed and then evacuated of air. The outer layer acts as glazing; the inner layer is specially coated to act as a heat absorber. A U-shaped copper tube enters and leaves the end of each vacuum tube. The individual tubes are connected in series.

Once heat is trapped inside the collector tube, it is conducted by a metal fin connected to the U-shaped copper pipe. The heat is removed by fluid flowing through the pipe and it flows through three separate heat exchangers to an 8,000-gallon insulated storage tank.

A fifteen-month study, begun in October of 1978, is measuring the system's performance; data will be computer-analyzed to determine the economics of operating and maintaining the system, and its value in saving energy.

Critique/analysis: Although this system is installed in a textile mill, the manufacturer claims that it could be adapted to use in chemical, metal-finishing, and food-processing plants. Of the textile industry alone, project spokesman, Dr. James F. Bostic, Jr., said, "Extended industry-wide 'use of solar' energy, as demonstrated at La France, could save dyeing and finishing plants the rough equivalent of eight million barrels of oil



a year." The industry now consumes approximately twice that amount.

Renewable Resources—A National Catalog of Model Projects

Category	Industrial
State	SC
Project Name	Solar Office Building

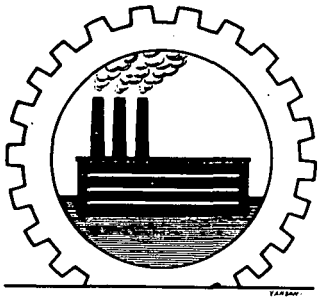
The owners of the Inland Bridge Construction Company of Chester are building a solar-tempered, energy-conserving office for themselves. Between 50-60 percent of the building's heating will be derived from solar energy. Conservation measures incorporated into the design of the building will make its energy requirements far lower than those of most conventional buildings.

The 2,600 ft^2 office space has an earth berm around much of its exterior. Winter heat loss and summer heat gain are thus greatly reduced. A large amount of insulation and insulating glass are being used to conserve energy.

There will be a major glass area in the south-facing lobby that will admit the low winter sun, and an overhang will prohibit the higher summer sun from entering. Angled sunscreens will be employed to prevent sunlight from entering east-and west-facing windows in the summer. Natural ventilation will be aided on pleasant days through use of a fan system.

Solar air collectors will be mounted on the roof. This 300 ft^2 system will be constructed on-site by the owner using commonly available materials. The heat collected will either be stored in a rock-storage bin, or delivered by air-duct directly to the living
e. A heat pump will provide the back-up
em for heating and cooling.

Organization	Inland Bridge Construction Company
Address	P. O. Box 280, Chester, SC 29706
Contact	n/a
Telephone	(803) 385-5841
Funded By	Private
Cost	n/a
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

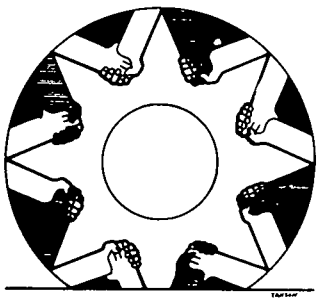
Category	Outreach
State	SC
Project Name	South Carolina Environmental Coalition
Organization	South Carolina Environmental Coalition
Address	P.O. Box 5761 Columbia, SC 29250
Contact	Keith Thompson
Telephone	(803) 799-0321
Funded By	DOE (through Georgia Solar Coalition & SC Environmental Coalition)
Cost	$300 approximately (workshops)
Congressional District	II
Compilation Date	February 1980

A series of workshops initiated cooperatively by the S.C. Environmental Coalition, the Georgia Solar Coalition, and the U. S. Department of Energy's Appropriate Technology Small Grants Program were held in the Spring of 1979 to provide interested people with technical assistance in grant-writing. The Carolina Renewable Energy and Appropriate Technology Exchange (CREATE) was formed within the South Carolina Environmental Coalition to facilitate networking and information exchange in the AT grants program during its first cycle. The exchange may be extended into the 1980 cycle beginning in January.

CREATE held workshops in Columbia, Greenville, and Charleston in early May. These proved instrumental in allowing people working with AT to meet and talk to one another and to complete their grant applications, which in some cases would not otherwise have been submitted.

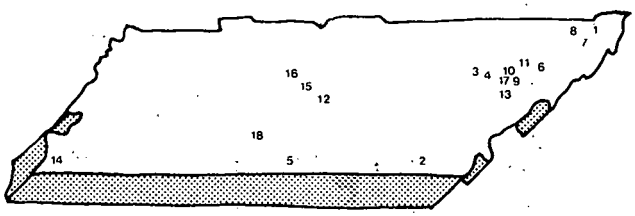
Critique/analysis: The Appropriate Technology Small Grants Program is a promising move by Congress to fund projects that use renewable energy and conserve non-renewable resources. The beneficiaries are those small-scale, low-cost projects that use local materials and provide benefits to local communities. Inventors, entrepreneurs, small businesses, non-profit organizations and communities are the groups targeted for these grants. Up to $10,000 is available for research grants, and up to $50,000 is offered for development and demonstrations of appropriate technologies.

South Carolina has a pressing need to provide a forum for discussing appropriate technology (in particular, communities need ways to meet these needs with available techniques and program ideas).



TENNESSEE

1. Blountville
2. Chattanooga
3. Cookeville
4. Crossville
5. Fayetteville
6. Jefferson City
7. Johnson City
8. Kingsport
9. Knoxville
10. Lake City
11. Luttrell
12. Manchester
13. Maryville
14. Memphis
15. Murfreesboro
16. Nashville
17. Norris
18. Summertown



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Category	Agricultural
State	TN
Project Name	Agricultural Marketing Project

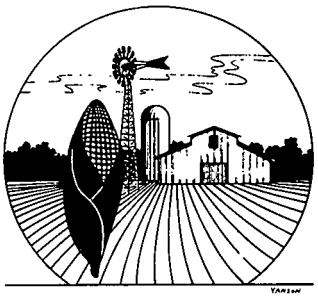
The Agricultural Marketing Project (AMP) is a non-profit organization working in several Tennessee Valley states to provide alternative food systems to both producers and consumers. In recognition of the fact that energy production and usage has a central role in agriculture as it is currently practiced, the AMP has created an Appropriate Technology Program. The objective of the AT-Project is to provide direct assistance to small farmers and rural people in increasing their energy self-sufficiency. The project seeks to demonstrate that owner-built alternative energy projects are technically feasible and economically attractive.

Dennis Gregg, the project manager, has assisted individual farmers and homeowners with the development of management systems in the design and construction of low-cost solar or other equipment. To date, he has assisted in the insulation of a hog farrowing house, construction of a solar heating system for a commercial greenhouse, a solar grain dryer, and a self-heating farrowing house.

Another important component of the project is contact with Vocational-Agricultural students, Future Farmers of America groups and other student groups. By working with them on projects such as the construction of a greenhouse on a school, Gregg is able to convince them of the appropriateness of simple solar and renewable energy projects.

At present, working relationships have been established in two counties of the Cumberland Plateau area of Tennessee.

Organization	Agricultural Marketing Project
Address	Rt. 6, P.O. Box 403 Crossville, TN 37204
Contact	Dennis Gregg
Telephone	(615) 297-4088
Funded By	Contract with TVA
Cost	$24,000 for first year
Congressional District	III & IV
Compilation Date	February 1980



Critique/analysis: The first year of the program has been extremely successful. Funding for 1980 is uncertain.

Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	TN
Project Name	Norris Community Energy Management Plan
Organization	Norris Community Energy Management Plan
Address	Mayors Office Norris, TN 37828
Contact	Monte Harold
Telephone	(615) 494-7173
Funded By	TVA and others
Cost	n/a
Congressional District	III
Compilation Date	February 1980

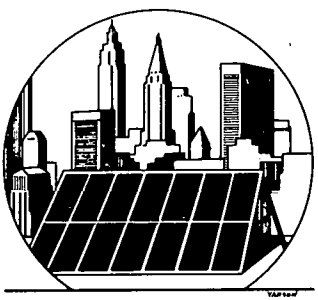
In 1978 leaders in the Norris city government and other sectors of the community began developing a plan for management of the city's energy resources. (Norris, a town of 1,300, is the site of Norris Dam, the first dam built in the TVA system.)

In October of 1978 a proposal was submitted to the TVA Board of Directors for a Norris Energy Demonstration Program. The proposal resulted in a commitment of TVA staff and technical assistance. With TVA's help, town leaders developed the Norris Community Energy Plan. They published a small booklet of the same title to describe their activities, recommendations and goal of becoming a model for energy resource management.

During the planning stage, citizen committees formed to consider specific programs. Extensive data collection began. Figures about energy consumption were gathered from 72 percent of households, 100 percent of commercial and industrial concerns, and from kilowatt hour consumption records of the Clinton Utilities Board.

Data indicated that Norris consumes most of its energy as gasoline, with the other large component being electricity. Consequently, the city plan put heavy emphasis on transportation alternatives, especially vanpooling.

The Norris Community Energy Plan calls for projects to be conducted over 3½ years (7/79-1/84), with Phase 1 projects scheduled to be completed in the first 18 months. A 15-20 percent reduction in consumption of each energy type is proposed in Phase One. Twelve discrete projects are proposed (3 projects each of the Alternative Energy Sources Committee: Conservation



Committee, Architectural Design and Land Use Planning Committee; and the Communications and Education Committee). Eight of the 12 will be performed independently, by Norris citizens; four depend on TVA for funding.

In October of 1979, TVA notified Norris that 100 solar hot water heaters and an unspecified number of woodstoves would be made available to Norris residents, assuming the cooperation of the Clinton Utilities Board. Five homes would be built through the Solar Homes for the Valley project. The addition of a solarized meeting room to a proposed Community Center is also under discussion.

Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	TN
Project Name	Garden Center

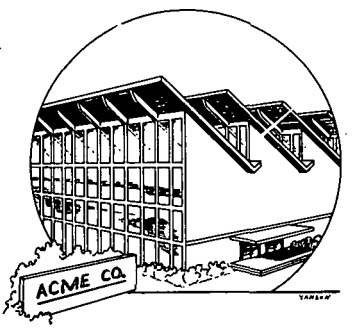
One of the first commercial solar buildings built in the Mid-south was a 1,500 ft^2 passively conditioned Garden Center.

The Garden Center is constructed of wood with a steeply sloping roof and broad expanse of glass on the south. Heat passes through the insulated glass, and is absorbed by the black concrete floor and walls of black stone. Excess heat is drawn by a fan from the ceiling. It is then blown through 12" ducts beneath the concrete slab. Heat transferred to the concrete can be tapped by opening vents along the slab perimeter. Heavy curtains cover the windows at night.

The most unusual feature of the Garden Center is its roof, which is covered by a dense sod. The soil insulates the house; evaporation and transpiration from the soil actively cools in the summer.

The temperature at the base of the roof never exceeds 75-80 degrees.

Organization	Trees by Touliatos
Address	2018 Brooks Rd., Memphis, TN 38116
Contact	Plato Touliatos
Telephone	(901) 346-8065
Funded By	Private
Cost	$17,000 $12 ft^2
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	TN
Project Name	Hidden Springs Nursery

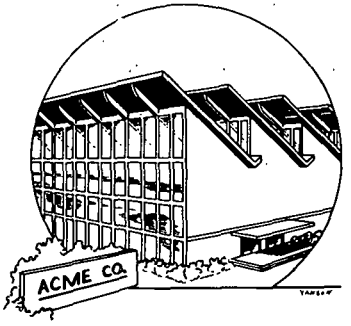
Organization	Hidden Springs Nursery
Address	Route 1 P.O. Box 186-1A Cookeville, TN 38501
Contact	Hector Black
Telephone	(615) 268-9354

Funded By	Private
Cost	$10 ft^2 $2,400 (Solar)
Congressional District	IV
Compilation Date	February 1980

Hidden Springs Nursery, a small family-owned business, raises a hybrid strain of fuchsia in passive solar greenhouses. The business started in Georgia and moved to Tennessee in 1977. At the time of the move, the family decided to build its new greenhouses using passive solar techniques to help offset the typically high costs of fuel oil and other conventional energy sources. The family also wanted a design that would require a minimum of maintenance.

The 95' x 27' x 20' greenhouse has 2,500 sq. ft. of floor space and 30,000 cubic feet of volume. Total glazed area is 2,400 sq. ft. The greenhouse has an 8/12 southern roof pitch for solar collection, which generates the heat stored in 175 55-gallon drums filled with water (corrosion inhibitor added). Auxiliary heat is provided by a wood-burning stove (automatic, circulating type) having an approximate 50,000 Btu/hour rating.

Critique/analysis: For the two years the greenhouse has been in operation, the family has maintained daily records to document performance. During the winter of 1977-78 (which was severe - 15 percent more degree days than normal) the greenhouse temperature ranged from a low of 37 degrees F to 90 degrees F. Solar provided 77 percent of the heat contribution during this period, with the remaining 31 percent supplied by wood. Between two and three cords of wood were used for the entire heating season. The $2,400 solar portion of the greenhouse has a four-year payback, assuming fuel oil savings at $600/year.



Renewable Resources—A National Catalog of Model Projects

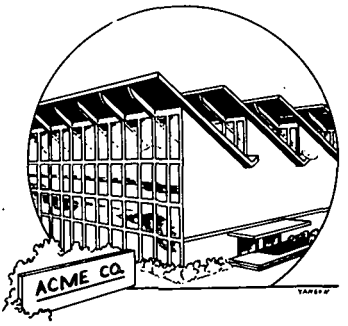
Category	Commercial
State	TN
Project Name	Solganic Greenhouse
Organization	Trees by Touliatos
Address	2018 Brooks Rd., Memphis, TN 38116
Contact	Plato Touliatos
Telephone	(901) 346-8065
Funded By	Private
Cost	$55,000
Congressional District	VIII
Compilation Date	February 1980

Most visitors to the "Solganic" Greenhouse at Trees by Touliatos in Memphis do not realize that they are in a unique commercial building, one that derives 100 percent of its heating from a combination of direct solar gain and biomass sources.

The 5,700 ft^2 building is 179 feet long, with 2,100 ft^2 of single-glazed plate glass stretching the full length of the south face. Heavy slab construction of the floor, massive stone walls on the east and west, and water-filled drums provide ample thermal storage (a building mass of about 470,000 pounds). Air movement and heat transfer occur by natural convection, with some fan assistance. The 2" x 6" studs allow for heavy insulation in the walls. The ceiling is insulated with 10 inches of treated cellulose.

Back-up heat is provided by 5,400 cu.ft.of composting sawdust. Sawdust is loaded into bins in the fall. A feeder pipe drips a mixture of water and nitrogen on each pile to moisten it and balance the high carbon content of the sawdust. Small fans then force air through the files to aerate the mixture and to pick up heat. Warmed air is blown into the greenhouse area, where foliage plants are grown. Decomposition takes place throughout the winter, releasing about 30 percent of the total ...ssible energy contained in the woodwaste. ... the spring the bins are emptied, and the ...ainder is sold as a replacement for peat moss.

In the summer the duct system beneath the concrete slab is used for cooling. Pipes running underground from the north wall are used to draw cooled air into the building and beneath the concrete, thus cooling the entire floor.



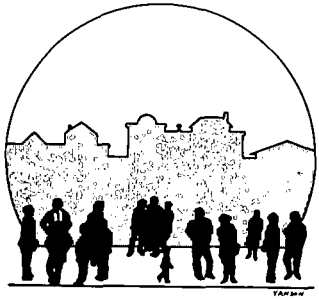
Renewable Resources— A National Catalog of Model Projects

Category	Community
State	TN
Project Name	East Tennessee Design Center
Organization	East Tennessee Design Center
Address	1522 Highland Ave., Knoxville, TN 37916
Contact	Annette Anderson Frank Sparkman
Telephone	(615) 525-9945
Funded By	United Way ; Action
Cost	$42,000 (ACTION)
Congressional District	II
Compilation Date	February 1980

The East Tennessee Design Center's decision to build a demonstration solar greenhouse came in response in part to Sun Day 1978, as well as in recognition of the community's needs for a viable hedge against rising fuel and food costs. Attached to the Center's office (a restored house in downtown Knoxville), the greenhouse serves as a working model for the community. It was built in a workshop format with materials donated by local businesses. Part of the labor was provided by VISTA volunteers.

The East Tennessee Design Center offers design assistance to organizations and community groups who cannot afford to pay private professional fees. Its design work encompasses a variety of projects within four major areas: community centers, community improvements, community planning and cultural facilities. Much of the design work is performed by students of the School of Architecture in the University of Tennessee.

The Design Center is now expanding its greenhouse program through an ACTION grant of about $42,000 which will allow them to build and demonstrate four greenhouses in four different communities within their 16-county service area. The Design Center staff believes that passive solar retrofits can provide substantial economic benefits to low and moderate income households. They hope to prove their point by building, monitoring, and demonstrating greenhouse operation in East Tennessee.



Renewable Resources—A National Catalog of Model Projects

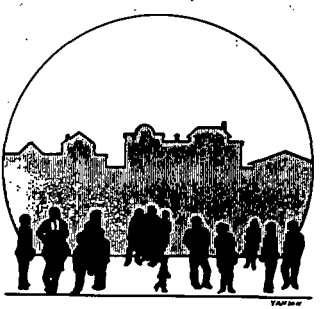
Category	Community
State	TN
Project Name	The Farm

In the fall of 1979, 250 school age children of "The Farm" in Summertown began classes in a newly built school. Awaiting them was a 6,000 ft^2 passive solar classroom building, constructed during the spring and summer by The Farm's construction crew.

The building is constructed mainly from recycled and salvaged materials. Its designers expect that approximately 80 percent of the building's heating needs will be provided passively from direct solar gain. A modified salvaged coal-fired boiler will provide backup heat through a system of pipes in the building.

The Farm is well known both in Tennessee and nationally as one of the most successful and long-lived of the many intentional communities established in the late 60's and early 70's. Formed around the teachings of Stephen Gaskin, the community now numbers 1,100, and owns 1,700 acres of rolling farm country in central Tennessee. Perhaps best known as a center for natural childbirth and midwifery, The Farm members have worked toward self-sufficiency and simple, cooperative lifestyles since its founding.

Organization	The Farm
Address	156 Drakes Ln. Summertown, TN 38483
Contact	Howard Switzer
Telephone	(615) 964-3574
Funded By	Private
Cost	$50,000
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	TN
Project Name	Lincoln County Energy Conservation Committee
Organization	Lincoln County Energy Conservation Committee
Address	P.O. Box 507 Fayetteville, TN 37334
Contact	Edward L. Sandlin
Telephone	(615) 433-6423
Funded By	n/a
Cost	Projected: $2 million (three-year program)
Congressional District	IV
Compilation Date	February 1980

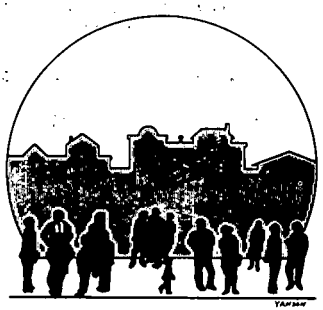
The Citizens of Lincoln County have developed and are now implementing a proposal for a demonstration in efficient and thrifty energy use to be conducted by the people of Lincoln County and the Tennessee Valley Authority. The concept for a county-wide demonstration project was initiated in December of 1978 by a group of Lincoln County citizens. After contacting support agencies for technical assistance and funding, the concept was shared with the citizens of the County. The group received active support from about sixty individuals (who then formed task forces) and a pledge of staff assistance from the Elk River Development Association.

The objective of the three-year program is to significantly reduce the per capita energy consumption in Lincoln County. The following nine task forces were formed to carry out this objective:

Education and Information: Develop library resources and school curricula, create a speakers bureau, and acquire new information resources;

Transportation: Obtain employment and residence data in order to design transport routes, test bus and van routes, obtain electric vehicles for local demonstrations;

Agriculture: Develop and operate an energy efficient farm (to demonstrate efficient equipment and management and to serve as a prototype of an energy conservative agri-business), test experimental procedures and equipment for farm energy efficiency, stimulate sound conservation principles in the farm community, and hold a "Farm Energy Fair";



Home weatherization: Expand existing audit programs and provide additional manpower to handle resulting requests for help, provide incentive for builder of "super-saver" home, fully weatherize one or more homes and monitor savings, develop solutions to landlord-tenant weatherization problems, expand solutions to energy consumption problems in public housing, expand programs for improvement of substandard housing, initiate a warm-room program, implement infrared scan program;

Weatherization of public buildings: Prepare special audits and improvements on five public buildings, implement improvements, monitor and publish results;

Wood applications: Place high-efficiency heaters in homes and monitor their performance, conduct a stove safety education program, provide inspection for installations, study the county's wood resource, sponsor a wood-heating equipment fair.

Solar applications: Secure builders for two solar homes, design solar hog-farrowing barn, place ten water-heating systems in homes and monitor;

Other energy sources: Investigate reinstallation of hydropower facilities at the Harms Dam (original source for county electricity), plan and install wind power plant;

Staffing and program management: Prepare proposal, devise baseline survey on consumption, obtain field data, and do routine management.

The first public event sponsored by the committee was the "Wood Fair on the Sguare" in Fayetteville on September 21-22 of 1978.

In October a tour of homes in the Fayetteville area was held, emphasizing good model homes in conservation technologies.

Task forces continue to meet regularly, and committee leaders hope to hold some public education events monthly.

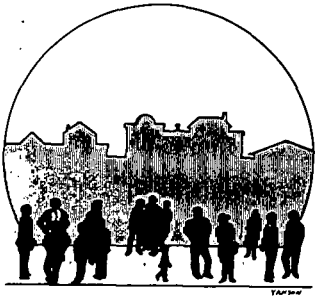
Renewable Resources—A National Catalog of Model Projects

Category	Community
State	TN
Project Name	Okra Ridge Natural Labs (ORNL)
Organization	Okra Ridge Natural Labs (ORNL)
Address	Rt. 2, Luttrell, TN 37779
Contact	Michael Moshell
Telephone	n/a
Funded By	Private
Cost	n/a
Congressional District	III
Compilation Date	February 1980

Okra Ridge Natural Labs (ORNL), is a small "intentional" family that operates a cooperative farm. ORNL is developing skills in the areas of owner-built passive homes, home-built solar food dryers and water heaters, and greenhouses. To date it has built four passive solar houses.

ORNL offers library resources to the community nearby, and will provide speakers to groups.

ORNL envisions the farm as a future learning center, and views the most important "technology" as being small-group politics.



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	TN
Project Name	Solar Greenhouse Employment Project

Organization	Solar Greenhouse Employment Project
Address	Rt. 2, P. O. Box 42 Lake City, TN 37769
Contact	Randy Hodges
Telephone	(615) 426-7252

Funded By	Various foundations
Cost	n/a
Congressional District	III
Compilation Date	February 1980

The Solar Greenhouse Employment Project was created to work with rural people in the Southeast, particularly the small farmer. Its dual objectives are to demonstrate the value and applicability of solar greenhouses, and to create employment in both the construction and operation of solar greenhouses.

The project builds demonstration greenhouses in workshop format, often with students from Vocational-Agricultural school programs. Initially formed in North Carolina, the project now also works in Alabama, Mississippi and Tennessee.

At the time of publication, the project had two greenhouse projects underway, with others planned. The projects are targeted for several counties of the Cumberland Plateau, where coal mining activities have caused severe damage.

Critique/analysis: While it is too early to document the impacts of work by the Solar Greenhouse Employment Project on the Cumberland Plateau, they are likely to be significant. Communities in the coal areas have a particular need for tools of self-sufficiency, given their very limited control of institutions that affect their lives. A very vital, supportive network exists in and among many of the coal communities; and it is within this network that Hodges has initiated his first projects.

Renewable Resources— A National Catalog of Model Projects

Category	Community
State	TN
Project Name	South Memphis Development Corporation
Organization	South Memphis Development Corporation
Address	215 Madison Avenue Memphis, TN 38103
Contact	Blair Pollock
Telephone	(901) 522-9238
Funded By	Dept. of Energy; Dept. of Labor
Cost	Approximately $250,000 for 1 yr. project
Congressional District	VIII
Compilation Date	February 1980

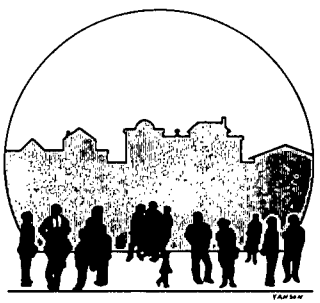
In March of 1979 the South Memphis Development Corporation (SMDC) initiated one of 15 SUEDE (Solar Utilization, Economic Development and Employment)* projects in the country.

The project has two goals: to ready its trainees for jobs in the commercial solar sector and to place solar equipment in the low-income community, thereby demonstrating its appropriateness in that situation. Four training cycles will be held during the one-year project. Forty systems will be installed.

Trainees are drawn from the low-income community of Memphis, and must be CETA-qualified. Recipients of the systems are selected through Community Action Agencies, Memphis Community Development programs, and outreach through the the CETA structure and SMDC.

The South Memphis Development Corporation (SMDC) is a minority owned, non-profit community-development corporation that first became involved in solar projects in 1978 through the TVA Memphis 1000 program. SMDC contracted with TVA to conduct the installer training program and to operate the Solar Resource Center to provide general solar information to the public.

*(SUEDE is a cooperative federal program ded in 1978 by the Department of Energy, artment of Labor, and the Community Services inistration and designed to provide employment and on-the-job training in the assembly and installation of solar equipment on dwellings of low-income families.)



Critique/analysis: The Memphis SUEDE project has had several effects: creation of solar job skills; introduction of solar to low-income communities; stimulation of a dialog about solar in Memphis; and the enhancement of SMDC as a supporting force for economic development.

In addition to operating the TVA and SUEDE solar programs, SMDC is also a majority owner of one installer company in Memphis, and anticipates offering employment to a number of trainees through that company. SMDC's goal is to enhance minority economic business development through capitalization and business management technical assistance. Its SUEDE program is being thoroughly monitored to produce data that will facilitate inauguration of similar training programs elsewhere.

The project has been slow to gear up. Initiated in March of 1979, it did not take on its first trainees until May. Project managers believe most of the problems have been successfully resolved.

Renewable Resources—A National Catalog of Model Projects

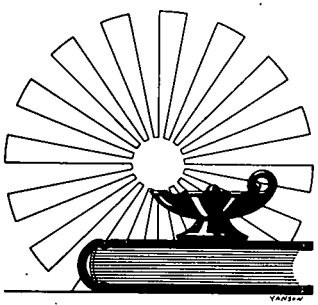
Category	Education
State	TN
Project Name	Alternative Energy Curriculum

Knoxville State Technical Institute offers six courses on alternative energy/renewable energy resources in its Mechanical Engineering Technology Department. Classes meet for three hours each week, plus three hours of laboratory. The student response to the offerings has been excellent to date. Titles of courses offered include: Introduction to Solar Energy and Conservation, Wind and Water Power Systems, Passive Solar Design, Active Solar Design, and Alternative Fuels and Systems.

The special topics class includes an introduction to geothermal, photovoltaic cells, energy storage, fuel-cells, ocean thermal gradients, waves, and other renewable energy sources.

Organization	Knoxville State Technical Institute
Address	3435 Division St., Knoxville, TN 37919
Contact	Dwight Magnuson
Telephone	(615) 637-4262 ext. 234

Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

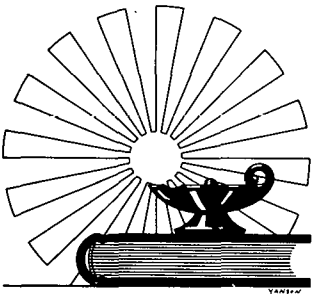
Category	Education
State	TN
Project Name	Instructors' Alternative Energy Handbook
Organization	Kingsport City Schools
Address	Kingsport, TN 37662
Contact	Jack Rhoton
Telephone	(615) 245-3155
Funded By	Kingsport City Schools
Cost	n/a
Congressional District	I
Compilation Date	February 1980

Jack Rhoton and seven fellow Kingsport City School teachers have developed an instructor's handbook on how to introduce students to renewable energy sources issues. The 68-page book focuses on the physical processes involved, including wind, sun and other alternative energy systems. It addresses how each system might potentially contribute on a national scale, while outlining appropriate "hands on" activities for students.

The book was prepared for use in the 1978-79 school year, and distributed to science teachers in elementary, middle and high schools in Kingsport. A number of other teachers brought classes to view, the thermosiphon hot water system constructed at Lincoln Elementary School in conjunction with preparation of the book.

Critique/analysis: The Kingsport curricula guide is apparently the only one of its kind in Tennessee. Rhoton reports that many teachers used it and reported good success, particularly with hands-on classroom activities.

The supply of copies in Kingsport is exhausted, but Rhoton indicated that teachers are welcome to copy all or parts of it for their own use.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TN
Project Name	MTSU Energy Curriculum

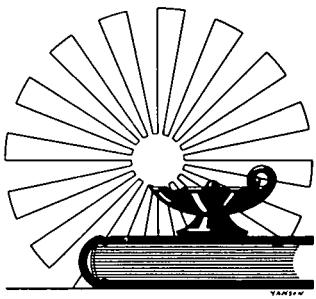
Middle Tennessee State University (MTSU) has become a leader in solar education in the state, both through formal curricula and through sponsorship of seminars, exhibits and conferences. In the spring of 1979, the school added the following courses to its Industrial Arts program to provide practical solar training.

Solar Home Design, is targeted towards architectural, engineering and interior design students. The course teaches basic concepts of solar use and specifics of passive and active home design, plus fundamentals of building construction details.

Solar Building Fundamentals, is designed for both Industrial Arts students, and individuals who hope to design their own homes. It presents basic solar concepts, teaches design methods for passive solar use, and discusses criteria for selection of active systems.

Solar Greenhouse Construction, is intended primarily for homeowners and owner-builders. Basic solar concepts are taught in early classes, followed by hands-on construction at sites in the Murfreesboro area.

Organization	Middle Tennessee State University (MTSU)
Address	Industrial Studies Dept., MTSU Murfreesboro, TN 37132
Contact	Bill Mathis
Telephone	(615) 898-2778
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TN
Project Name	Museum Exhibit

Organization	The Unbroken Circle Architecture, Solar Energy and Nature
Address	3415 West End Ave., Nashville, TN 37203
Contact	Berle Pilsk
Telephone	(615) 269-0996

Funded By	Tennessee Committee for the Humanities
Cost	$18,000
Congressional District	State-wide
Compilation Date	February 1980

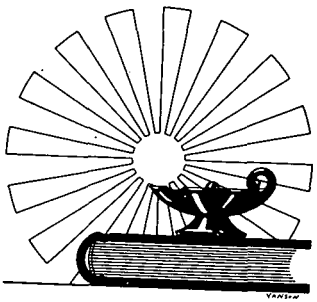
Architect Berle Pilsk, well known in Nashville as an articulate proponent of design with nature, recently obtained a grant from the Tennessee Committee for the Humanities (TCH) to create a traveling museum exhibit to illustrate how architecture expresses human values.

The objective is to contrast indigenous architecture, which makes up the bulk of architecture on a global scale, with architecture of the developed world.

Pilsk, together with a project committee drawn from museum, archaeological and architectural professions, is working with an advisory committee of humanists to develop a major museum exhibit. The traveling exhibit will feature text, photographs and architectural drawings indicating how old principles of solar energy design can be used in new ways, with emphasis upon applications in Tennessee. Pilsk hopes to demonstrate that Tennesseans' strong cultural traditions support ecologically valid technologies and energy-conserving architecture.

The exhibit will first be shown in Nashville in early or mid-1980. Later it will tour to Memphis, Oak Ridge and other localities. It will be accompanied by media presentations, musical accompaniment and, in selected areas, a panel discussion of the exhibit.

Critique/analysis: The project has been very slow to develop. Participants were first scheduled to begin planning in April of 1978, for a showing by fall of that year. The project director hopes to open the exhibit by mid-1980.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TN
Project Name	The Road Company

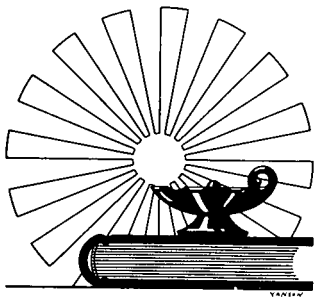
The Road Company theatrical group based in upper east Tennessee, has developed its tenth original production around the theme of the nation's energy crisis, Horsepower: An Electric Table. The company describes Horsepower as "an allegorical investigation of the responsibilities of energy consumption". The play is an ensemble production, an original work developed in improvisational rehearsals by the company.

The play was developed with support from the National Endowment for the Humanities through a grant from the Tennessee Committee for the Humanities (TCH). The play premiered in Johnson City in September of 1979, and subsequently toured to Knoxville, Memphis and Nashville.

Jo Carson, who researched and wrote the play, used an unusual method for developing dramatic material: town meetings. A portion of the TCH grant was used to organize four informal community meetings, at which 20-30 people from the Johnson City area gathered to discuss energy patterns, values, and lifestyles. From the material gathered, plus research into classical and contemporary works, Carson developed an original short story, which was then scripted into a stage show with the help of the company actors. Multi-media effects by Nashville media artist Don Evans, and live musical accompaniment by Rod Stipe complete work.

The play presents symbols and questions through a fast moving series of vignettes wrapped around the Prometheus myth. The play begins and ends on an optimistic note, with an eye to beneficial changes which the public may choose to make.

Organization	The Road Company
Address	P. O. Box 5278 EKS Johnson City, TN 37601
Contact	Jo Carson Bob Leonard
Telephone	(615) 926-7726
Funded By	Tennessee Committee for the Humanities, local sponsorship
Cost	Grant $15,000 for development & first show.
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

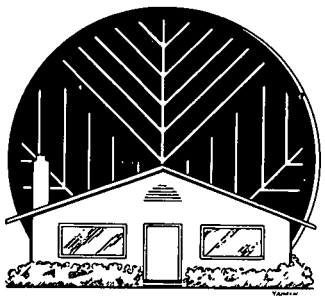
Category	Housing
State	TN
Project Name	Mid-America Solar Energy Research & Development Agency
Organization	Mid-America SE... Development Agency
Address	Rt. 4, P.O. Box 245-B Manchester, TN 37355
Contact	John Sipes
Telephone	(615) 728-1626
Funded By	Private
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

From a distance, the Sipes home near Manchester looks like a conventional large family home, except for the windmill towering above it. In fact, it is extremely unconventional. It uses many passive design components: southern windows, carefully calculated overhangs, high ceilings vented for summer circulation, and a massive stone fireplace wall inside. Plenums in the rafters suck warm air down and into the heat pump duct system for redistribution. The heat pump is located on the south side of the house and is enclosed in a vented clear plastic case.

The house also has a solar furnace built into a south-facing wall above the shop/garage. One hundred twenty sq. ft. of glazing enclose the space, which contains black pipes running through old-fashioned galvanized guttering to concentrate heat. Mirrors on the floor increase concentration. The solar furnace, when complete, will circulate heated water through a maze of four inch black plastic flexible tubing which will snake through the crawl space under the house. Vents allow the warmed air to rise into the house.

The final and most impressive component of the home is its windmill. Sipes built a horizontal-axis windmill mounted next to the house on a 67 foot tower (20 feet above treeline).

The blades are in a scoop or elongated airfoil form, and are made from heavy sheet aluminum with redwood struts. The heavy equipment (differential and generator) is mounted at the base of the unit so a simple lightweight tower is adequate for support of the blades themselves. Locating heavy components at the base also reduces danger from windstorms. The most important aspect



of this windmill is that it will produce one to three KW at windspeeds generally available in Tennessee, and will produce e energy down to about two mph.

A key to the system is a series of truck batteries wired in parallel for storage, and a DC-AC inverter (which is reportedly 93 percent efficient).

Sipes currently uses his system to drive a 2,500-watt heat pump. He believes that with the addition of more inverters and batteries, his system could deliver an output of 10 KW and could store enough energy for 20 hours of windless conditions. Such a system, Sipes estimates, could be built for $8,000 and would be capable of handling all the home's electrical needs. He also believes the system could be used to generate power for electric cars.

Critique/analysis: John Paul Sipes is one of Tennessee's best known independent solar and renewable energy experimenters. Trained as a master machinist, Sipes performs his independent projects under the auspices of the Mid-America Solar Energy Research and Development Agency. He has been working with solar systems for approximately ten years, and is doing much work presently with wind energy.

Renewable Resources— A National Catalog of Model Projects

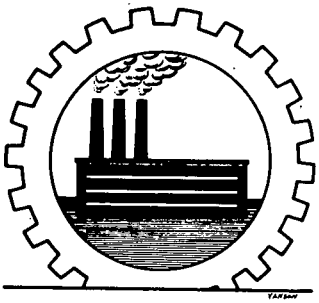
Category	Industrial
State	TN
Project Name	Coca Cola

The Coca Cola Bottling Company in Jackson, Tennessee, has one of the largest solar systems in the state. Since October of 1979, 10,000 sq. ft. of evacuated tube collectors have provided about 50 percent of the building's heated water needs.

The collector heats approximately 10,000 gallons of water each day from 65 to 140 degrees F. The heated water is used for washing returnable bottles, and for providing the building's space heating in the winter.

Critique/analysis: Because the system is replacing still cheap natural gas, the economics for the installation are not very favorable at today's prices. However, the company anticipates price escalations and curtailments. Furthermore, the engineers responsible for the project believe, in restrospect, that a more economical method might have been chosen had they not been operating under DOE grant guidelines.

Organization	Coca Cola Bottl: Company
Address	5575 Poplar, Suite 612, Memphis, TN 38117
Contact	Wendall McAlexander
Telephone	(901) 683-6727
Funded By	DOE Coca-Cola Company
Cost	$600,000
Congressional District	VI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	TN
Project Name	Cockrill Bend State Prison

The Tenneessee Department of Correction presently has four Regional Correction Facilities planned or under construction, including one at Cockrill Bend in Davidson County. Two of the facilities are solar equipped.

All four use a common design, and were put out to bid with an option for installation of solar domestic water heating systems on the "guild", or residence, units of the prisons.

The Cockrill Bend prison has been occupied since the summer of 1979 with a solar domestic hot water system.

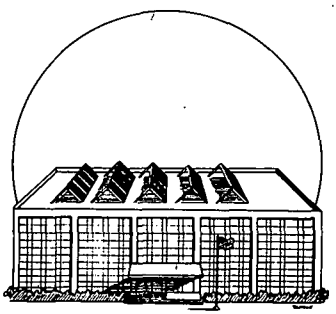
The prison at Pikeville will have the same type of system installed.

The Cockrill Bend prison uses a single-story building for each of the various vocational trade training classes, with each class housed in a "guild training" unit. Sixteen guild units are arranged around an oval Commons, with each building facing a different direction. Ninety-six sq. ft. of drain-down collectors are installed on each of the 16 housing units, tied into a joint storage tank and two-82 gallon back-up electric water heaters.

Organization	Cockrill Bend State Prison
Address	Div. of Arch. Ser., Dept. of Fin. & Admin. 1 Commerce Plaza, Ste. 1100, Nashville, TN 37219
Contact	Alonzo Westbrook
Telephone	(615) 741-6036

Funded By	State - conventional construction financing
Cost	$87,400 (Cockrill Bend) $84,000 (Pikeville)
Congressional District	V
Compilation Date	February 1980

Critique/analysis: The Department of Correcti and the Architectural Services Division sh be commended for incorporation of solar hot water into construction of new facilities. No grants or other subsidies were used. The Architectural Services Division has declared its intention to use solar in state buildings whenever it can be economically justified, and have several under construction or in planning.



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	TN
Project Name	Holston Elementary & Middle School Complex

The Holston Elementary and Middle School Complex, in upper east Tennessee, was the first school in the state to install solar energy technology.

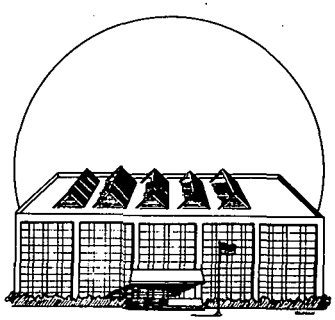
Plans for the school were initiated in August of 1977. When estimates revealed that the payback period on a solar system would be only seven years, the Sullivan County Board of Education approved the installation.

The building was designed for maximum efficiency. The mechanical system can recover heat from the core of the building. It is responsive to load changes caused by movement of people or of the sun, and to changes in outside temperature. Individual units can be operated during periods of low occupancy without having to condition the entire building.

Located on the school roof, 4,982 sq. ft. of potable water flat-plate collectors provide 40-60 percent of the space heating needs and 85-95 percent of the hot water needs. Heat from the collectors is stored in a 15,000 gallon steel tank buried two feet beneath the building.

Critique/analysis: "in my opinion the importance of the project lies not in any radical design or technological breakthrough, but in the mere fact that it happened here. A group of people traditionally seen as ultra-conservative, living in an area traditionally committed to the all-electric home, has been farsighted enough to utilize solar energy as an economically attractive alternative to power rates which, even in the TVA region, have nowhere to go but up", Ted Hensley, solar installer.

Organization	Holston Elem. ddle Sch. Complex
Address	Sullivan County Board of Education Blountville, TN 37617
Contact	Ted Hensley
Telephone	(615) 323-4181
Funded By	County school bonds
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

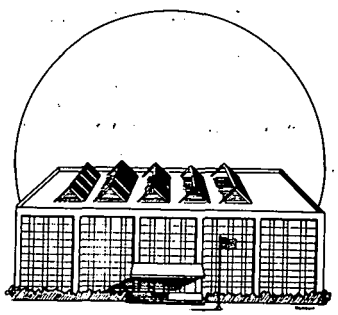
Category	Institutional
State	TN
Project Name	State Solar Facility
Organization	Tennessee Department of Safety
Address	Div. of Arch. Servs. Dept. of Finance & Admin. One Commerce Pl., Suite 1100, Nashville, TN 37219
Contact	Alonzo S. Westbrook
Telephone	(615) 741-6036
Funded By	State construction funds
Cost	n/a
Congressional District	V
Compilation Date	February 1980

The Tennessee Department of Safety has a new solar-equipped building. Built in 1977, the building is designed to serve a variety of functions: it houses offices, waiting rooms and testing facilities for the issuance of drivers licenses and for other administrative functions, and contains garage and maintenance facilities for State Highway Patrol vehicles.

The heating system for the building consists of concentrating-type solar collectors that operate in conjunction with water cycle heat pumps. Most of the collectors are roof mounted; however, additional collectors are mounted on the south wall, in front of large windows. The backing for the south wall collector tubes has been removed to create a visual effect. That is, patrons inside the building see the silver backs of the collector tubes. Sunlight passes between the tubes upon entering the building.

An electric boiler provides back-up heat to the system storage tank.

Critique/analysis: Removing the backing and insulation from the collectors reduces their efficiency.



Renewable Resources—A National Catalog of Model Projects

Category	Legislation
State	TN
Project Name	Property Tax Assessment Exemption
Organization	State of Tennes
Address	Div. of Property Tax Assessment, Office of the Comptroller Nashville, TN 37219
Contact	Ray Kennedy
Telephone	(615) 741-2837
Funded By	n/a
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

During the 1978 legislative session the Tennessee General Assembly passed HB 329, which exempts from property taxation "appliances, equipment, machinery, structures or other such property or portion thereof used primarily and necessarily for heating, cooling or electrical generation by solar or wind power." The Act and the exemption it provides for expires on January 1 of 1988.

The Act has been very lightly used since its passage for two reasons. The first is the relative scarcity of solar or wind equipment in the state; the second is that such equipment is assessed for taxation only when a county undergoes reassessment.

Because the act has been used so little it is difficult to assess its impact. While wording of the Act would seem to allow exemptions for passive structures, no test of that presumption has been made. Decisions on what will be exempted are left to individual property tax assessors in each county, indicating that an extremely inconsistent application is likely.

Renewable Resources— A National Catalog of Model Projects

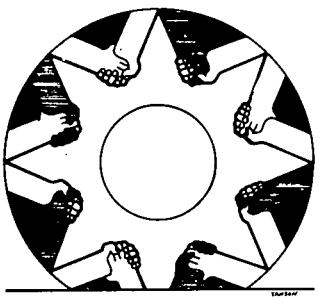
Category	Outreach
State	TN
Project Name	Energy, Environment & Resources Center (EERC)
Organization	University of Tennessee, Energy, Environment and Resources Ctr.
Address	329 South Stadium, Knoxville, TN 37916
Contact	Joyce Finney
Telephone	(615) 974-4251
Funded By	University of Tennessee, various contracts
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The University of Tennessee's Energy, Environment and Resources Center (EERC) was created by the University Board of Trustees in 1972 (under the name U.T. Environment Center). The Center is the University's focal point for multi-disciplinary environmental and energy programs, and has the dual responsibility of research and public service in the field of energy and environmental studies. Five programs operate from the Center, including an Energy Analysis and Diagnostics Program which emphasizes energy demand and management. The program has developed an energy management course, and has assisted in developing methods for the auditing of buildings in cooperation with the Tennessee Energy Authority.

The Center also has worked with the Tennessee Valley Authority and the Energy Research and Development Administration and other agencies in building and monitoring a hybrid active/passive home, an Annual Cycle Energy System home, and one control home. The Center has been responsible for follow-up monitoring and a publication on this Solar Energy Program.

The Center also has an Information and Education Program. This program is responsible for conducting selected research projects and publishing results, and for the operation of a library collection on energy supply and demand, conservation, and energy education. The library [illegible] ailable on a limited basis to the general [illegible] c.

A number of publications and slide/tape presentations on topics related to energy conservation have been developed by the Center. All are available free or for purchase. A list will be sent upon request. In the fall of 1979 the Center began working with the Knox County school system to develop comprehensive energy education information.



Critique/analysis: The Center's resources are well used by students and faculty of U.T. - Knoxville, and are fairly well known. They are also used by those outside of the University community.

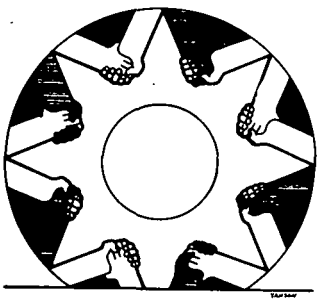
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	TN
Project Name	Solar Valley Newletter
Organization	Solar Valley Coalition
Address	Rt. 6, P.O. Box 403 Crossville, TN 38555
Contact	Louise Gorenflo
Telephone	(615) 788-2736
Funded By	TVA (proposed)
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

During the fall and winter of 1978-79, representatives from solar organizations in six of seven TVA states met to share ideas and discuss the forming of a Tennessee Valley coalition. Lengthy discussions among group representatives and with TVA Solar Applications Branch staff led to a proposal for the creation of Solar Valley, a newsletter about renewables, to be widely distributed throughout the Valley.

The newsletter will be chiefly funded by TVA as an information resource. Its content will include solar developments in the region. Planning continued for a year under the leadership of the Tennessee Solar Energy Association while a prototype issue was prepared. January of 1980 was the first issue date.

Critique/analysis: The process of formalizing a coalition, conceptualizing a publication to meet broad needs, and dealing with the TVA contract process has been arduous and frustrating, and has placed unrewarded work and responsibility on the handful of key organizers. If successful, the newsletter will be of tremendous benefit to the growing solar network in the Tennessee Valley, and will strengthen ties between that network and the principle solar bureaucracy in Valley, TVA.

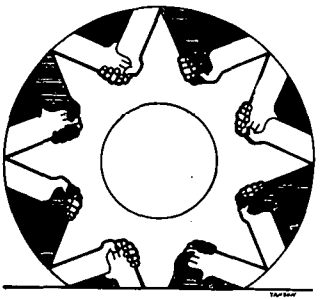


Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	TN
Project Name	Tennessee Solar Energy Association
Organization	Tennessee Solar Energy Association
Address	P.O. Box 448 Jefferson City, TN 37760
Contact	Joe Hultquist
Telephone	(615) 397-2594
Funded By	Membership dues
Cost	n/a
Congressional District	State-wide (based in II)
Compilation Date	February 1980

The Tennessee Solar Energy Association (TSEA) is a nonprofit organization, organized at Middle Tennessee State University in 1977. It has developed into a statewide membership organization with the purpose of fostering the development of solar and other renewable energy technologies. The Association is governed by a Board of Directors elected by the general membership. There are currently no paid staff positions.

Despite a critical lack of funding, the TSEA has successfully developed a wide range of programs including a monthly newsletter, educational outreach programs (solar greenhouse workshops), establishment of regional subchapters and provisions for consumer information and technical assistance. The TSEA is an affiliate of the American Section of the International Solar Energy Society.



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	TN
Project Name	Tennessee Valley Inter-League Council

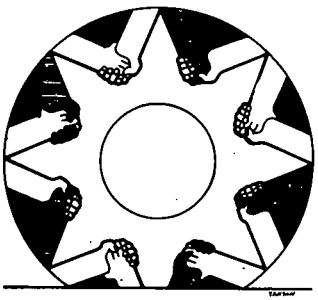
Organization	Tennessee Valley Inter-League Council
Address	League of Women Voters of TN., 1701 21st Ave. S., Nashville, TN 37212
Contact	Rosemary Conrad
Telephone	(615) 269-9777

Funded By	League of Women Voters of Tennessee Education Fund
Cost	Approximately $1,000/year
Congressional District	throughout Tennessee Valley
Compilation Date	February 1980

The Tennessee Valley Inter-League Council (TVILC), was created in 1978 as a joint project of state and local League of Women Voters (LWV) chapters in all seven TVA states: Tennessee, Kentucky, Mississippi, Alabama, Georgia, North Carolina and Virginia. Financial support comes from the LWV's Education Fund, plus dues paid by each of the participating state and local leagues.

TVILC has functioned primarily as a study committee. Task forces composed of representatives of the participating Leagues have undertaken in-depth studies of all aspects of TVA operations. Power programs have been given the closest scrutiny, but other major programs such as fertilizer production are also under study. The committee is volunteer, with limited funds available going to printing, travel costs, and other operational expenses.

The result of the initial work will be A Citizens' Guide to TVA - a pamphlet or small book published for general distribution. Upon completion of the publication, a process will begin to obtain support of the entire multi-state league membership for specific actions and positions related to TVA policies. As an example, TVILC participants unanimously support utility rates to stimulate conservation. They will seek unified League support for specific recommendations on rate structures, such as peak-load pricing.



Renewable Resources— A National Catalog of Model Projects

Category	State
State	TN
Project Name	Solar Welcome Centers

Organization	Tennessee Dept. of Transportation
Address	Div. of Arch. Svs., Dept. of Finance & Admin., 1 Commerce Pl., Suite 1100, Nashville, TN 37219
Contact	Alonzo S. Westbrook
Telephone	(615) 741-6036

Funded By	State construction funds, including federal portion
Cost	Variable
Congressional District	State-wide
Compilation Date	February 1980

The Tennessee Department of Transportation is currently building or planning to build several solar-equipped "Welcome Centers" along major highways entering the state.

Montgomery County Welcome Center will include solar hot water, using a drain-down type collector and tank system.

Cocke County Welcome Center, will use a solar/heat pump system. The heat pump system will use a medium temperature water to provide space heating and water pre-heating.

Dyer County Welcome Center will be developed as a prototype solar installation to serve as a model for future Welcome Centers. It will use a solar/heat-pump system based on the design of the Cocke County system, with changes made in response to data gathered from that system. It is anticipated that three or four more Centers will be based upon the prototype.

In addition, the renovation of 12 existing Welcome Centers, rest stops and Information Centers are now underway, or in planning. Most of the 12 will receive solar domestic hot water systems as part of the renovation.

An additional component of the 12 renovation projects will be small photovoltaic arrays to backlight a schematic of the solar system, and to provide nighttime illumination of the system. Inclusion of the small packaged photovoltaic systems was included to enhance public awareness of solar usage by the state.

The counties where renovation projects are planned are: Campbell, Giles, Cumberland, Dixon, Grundy, Benton, Hamilton, Jefferson, Madison, Robertson, Shelby and Sullivan.

Renewable Resources—A National Catalog of Model Projects

Category	State
State	TN
Project Name	Tennessee Energy Authority

Organization	Tennessee Energy Authority
Address	Capitol Blvd. Bldg. Nashville, TN 37219
Contact	Dr. John Colozzi
Telephone	(615) 741-6671

Funded By	State (with Federal Grants)
Cost	n/a
Congressional District	State-wide
Compilation Date	February 1980

The Tennessee Energy Authority (TEA) is the state agency responsible for the appropriate production, use and conservation of all energy forms in the state. Within one department, Energy Conservation, services are designed to fulfill the intentions of the State Energy Conservation Plan in four major areas: residential, industrial and commercial, state energy management, and transportation. The total program is designed to reduce the state's energy consumption five percent by 1980 from 1976 levels. The four program areas are supported by a Supplemental Energy Conservation Program, and Management and Evaluation services. Some of the more unusual services offered by TEA are outlined below.

TEA is working with the Knoxville Commuter Pool to fund a major portion of its work in facilitating carpooling and vanpooling in the Knoxville area. Similar services are under development in the metropolitan Nashville and Memphis areas, and will soon be initiated in the Chattanooga area. TEA works primarily with major employers in each area to develop information about transportation patterns and the potential for ridesharing. The agency provides help in conducting surveys, and doing computer analysis. In Nashville, 13,000 individuals have been entered on the computer for matching to carpools or vanpools.

TEA is mandated by law to work with the Tennessee Board of Standards to adopt rules establishing energy-efficiency standards for major energy consuming products purchased by the state. Guidelines have been developed for larger items to accommodate principles of life-cycle costing, and will eventually be extended to smaller items as the program progresses.

TEA estimates that 60 percent or more of the homes in Tennessee have inadequate attic insulation. As a tool for public education, the agency has contracted for airplane flights over populated areas of the state for the purpose of taking infrared photographs - or thermograms. The thermograms, which are made available to the public through libraries, show in considerable detail those buildings that are losing large amounts of heat. To date, the Nashville and Memphis areas, Jackson and Millington have been photographed. Up to 20 additional cities will be scanned in 1979-80. While the thermograms are not wholly reliable or accurate in a numerical sense, they seem to be effective as a teaching aid, and as a motivation for homeowners to invest in attic insulation.

A teacher's guide, "Ideas and Activities for Teaching Energy Conservation, Grades 7-12", was published in cooperation with the State Department of Education. Copies have been distributed to every school for use in science and social science courses. It is too early yet to tell how completely they will be utilized, but individual teachers seem to be enthusiastic. A second guide is being developed for Grades K-6.

In TEA's Project Conserve, residents of detached single family dwellings are invited to complete questionnaires that supply information for a computer analysis of home heat losses. The questionnaire provides some of the information that an audit of the home would provide. Questionnaires are returned to TEA for a computer analysis and are returned to the homeowner with an explanation of where energy losses are occurring, how they can be corrected and at what cost, and what the savings in utility bills will probably be. Questionnaires have been distributed with the cooperation of womens clubs, scout troops and banks. About 200,000 have been distributed, and 50,000 computer audits have been performed.

TEA also operates a toll-free "hotline" during business hours (1-800-342-1340) for the use of citizens seeking answers to energy-related questions.

As part of TEA's Small Grants Program, $54,000 has been made available to cities, towns, or counties for activities that will foster energy conservation. The maximum grant to be made is $6,000. The sum must be matched by an equal amount, or in-kind contributions. Recipients must meet a few conditions, such as promoting Project Conserve and the Energy Hotline, and distributing free literature, but the grants are otherwise relatively strings free.

The programs outlined above are operated under the State Energy Conservation Plan. In addition, the agency overlooks the Energy Extension Service (EES). Tennessee was one of ten pilot EES states, and uses its grants to conduct comprehensive activities in three counties - one urban, one rural and one mixed industrial. Most EES functions were successfully contracted through existing institutions, such as the Agricultural Extension Service, U.T. Institute for Public Service, and the Tennessee Environmental Council. The program met with fair success early on.

Using funds passed through them from the Southern Solar Energy Center, TEA in 1978 contracted with East Tennessee State University to produce an inventory of solar in Tennessee. The publication provides an overview of physical and cultural traits affecting solar use in Tennessee, lists agency programs, and names solar manufacturers, distributors, architects, and contractors who were active at that time. Recommendations for new programs, activities and legislation were made. The publication itself became quickly out-of-date as changes in the commercial scene occurred. But a computerized listing of the inventory has been established through Middle Tennessee State University to allow constant updating.

Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	TN
Project Name	TVA Energy Conservation Programs

Organization	Tennessee Valley Authority (TVA)
Address	Energy Conservation Branch, Power Service Center 3 Chattanooga, TN 37401
Contact	Rebekah Stulce
Telephone	(615) 755-3651

Funded By	Power revenues, limited appropriated funds
Cost	FY79 $2,100,000 FY80 $7,500,000 FY81 $9,400,000
Congressional District	Region-wide
Compilation Date	February 1980

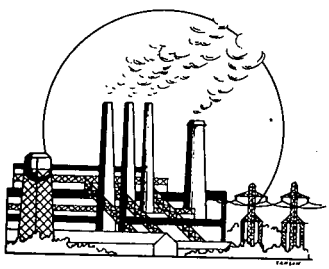
The Tennessee Valley Authority (TVA), the largest power distributor in the country, has assumed aggressive leadership among utilities in both energy conservation and renewable energy programs.

In 1977, TVA implemented its comprehensive home insulation program. Working through its municipal and cooperative distributors, TVA offered homeowners free home energy audits to determine where conservation measures were most needed, followed by an offer of interest-free financing for the purchase of attic insulation. This program was the first step toward broad conservation measures, which since have become a national model.

The rationale for sponsoring the program was that residential conservation would reduce overall energy use and, most importantly, shave peak loads. The end result would be lower costs for power production.

The method of operating the insulation program has been highly successful. TVA absorbs financing and administration costs, billing the consumer for repayment of principal on monthly power bills. Home auditors, who are distributor employees, check each home after installation of insulation. If the job is done properly, the distributor pays the local contractor who did the work. Contractors must be approved by the distributor, and compete for business.

TVA residents may now receive no-interest loans for attic or floor insulation, storm doors and windows, insulated doors, weather stripping and caulking. Low-interest loans are available for heat pumps.



Business and industrial customers are also offered technical assistance by TVA in reducing energy demands back-up by financial incentives for implementing needed changes.

In its Super Saver Home Program, TVA developed high standards for conservation measures in new homes, calling for R-30 attic insulation, heat pumps, limited window space with double glazing, and other methods. These houses typically save up to 75 percent in energy consumption over conventionally built homes.

TVA has also developed and demonstrated insulated modules which create a single enclosed living space within a home, where full winterization is prohibitively expensive. In its land arrangement program, TVA has tested various methods of reducing peak loads, and has studied the feasibility of alternative rate structures to motivate energy conservation.

In its Waste Recovery Program, TVA has helped fund one thermal plant in Gallatin, Tennessee, to produce industrial steam and electricity from the combustion of solid wastes.

TVA has also committed itself to provide a long-term market for electricity to industries willing to invest in co-generation. Six industries in the state already have co-generation equipment, and others are expected to come on line.

In the transportation sector, TVA operates the largest van pool fleet in the nation. The system daily carries approximately 5,000 employees to 20 offices, power plants and construction sites. The agency has cooperated with bus lines in establishing morning and evening express buses to downtown headquarters. In addition, car pools have been arranged with TVA help for employees living outside of population centers. TVA estimates gasoline savings at 3.5 million gallons per year, and reduction in air pollutants at 900 tons per year.

Renewable Resources— A National Catalog of Model Projects

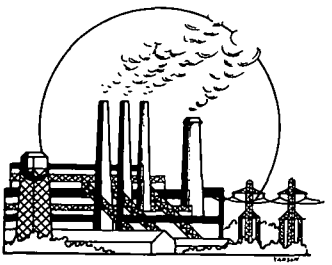
Category	Utility
State	TN
Project Name	TVA Renewable Resources Programs
Organization	Tennessee Valley Authority (TVA)
Address	Solar Applications Branch, 240 Chestnut Street, Towers II Chattanooga, TN 37401
Contact	Lilabeth Scott
Telephone	(615) 755-6506
Funded By	Power revenues, limited appropriated funds
Cost	FY79 $ 3,500,000 FY80 $13,500,000 FY81 $20,000,000
Congressional District	Region-wide
Compilation Date	February 1980

Since 1978 the Tennessee Valley Authority (TVA), the nation's largest power distributor, has become the nation's leading utility in solar and wood fuel programs. In June of 1979, President Carter "directed the TVA to become a 'solar showcase' to set an example for all utilities, whether publicly or privately owned, of how to accelerate the use of solar technology." Following is a selective list of TVA's renewable resource programs.

The TVA has implemented three solar hot water programs. The Solar Memphis project, initiated in September of 1978, was TVA's first major effort to encourage home use of solar energy in the Tennessee Valley.

The program operates through the South Memphis Development Corporation, a minority-owned, non-profit community development corporation responsible for training solar system installers. All participants in the Memphis program receive the same system components. Homeowners can receive a low-interest TVA loan for purchasing and installing the solar heating system. The customer repays the loan over twenty years at 3.37 percent interest as part of the monthly utility bill. One-thousand systems are to be installed under this program.

Solar Nashville, initiated in August of 1979, has a program goal of 10,000 installations over a three-to five-year period. Substantially different from the Memphis program, Solar Nashville will offer consumers their choice of TVA approved systems, which will be sold and installed by local businesses. TVA will also take advantage of investment funds made available by local banks and lending institutions.



Consumers will pay to selected lending institutions a specified interest rate (likely be in the 6 to 7 percent range), plus principal. TVA will guarantee the loan, and will pay the difference between the interest charged the consumer and a variable interest rate charged by the bank. TVA will absorb administrative costs. Consumers may have the option of choosing a graduated payment program similar to those for house financing, so their monthly payments increase as the cost of electricity for non-solar water heating does, thus assuring constant positive cash flow.

A third hot water program, announced in October of 1979, and sponsored in cooperation with the Middle Tennessee Electric Membership Cooperative, is the first TVA hot water program in a rural area. It will operate on approximately the same basis as Solar Nashville, and has a program goal of 1,000 installations.

In April of 1979, the TVA Board approved plans for a program to stimulate construction of solar homes throughout the Valley. Subsequently, TVA's Architectural Design Branch developed 11 distinct plans for solar homes; four of each design will be built by private contractors, financed in part by TVA, and sold on the open market. The homes buyers will be offered a small amount of money in return for permission to monitor the homes.

TVA is developing a program in conjunction with manufacturers and representatives of modular housing units, to integrate passive solar design as an option to modular-home purchasers.

The Architectural Design Branch of TVA has a full staff of solar architects who offer their assistance on both residential and institutional buildings.

In August of 1979, the Solar Applications Branch began the passive solar retrofit program. The emphasis of the program is primarily on

solar greenhouses. Managed by Bill and Susan Yanda, one of the Solar Sustenance Team in NM, the purpose of the program is to encourage the use of solar greenhouses and other passive retrofits on Valley homes.

The New TVA Chattanooga Office Complex will encompass 1.7 million ft^2 of computer facilities and offices. The building, designed to be 100 percent independent of purchased power, will utilize passive solar heating, daylighting, natural ventilation, re-use of computer waste heat, ground-water cooling, chemical dehumidification, and heat pumps.

TVA has also launched a large wood stoves program. The first initiative was operated through the North Georgia Electric Membership Cooperative to provide interest-free loans to families in six northwest Georgia counties to purchase stoves. Repayment of the loan is made on the monthly electric bill. Safe, efficient stoves must be selected from a list of TVA-approved brands, and must be installed to the satisfaction of distributor auditors who check each installation. The Georgia Forestry Commission is cooperating in helping families to locate firewood.

In July of 1979, TVA announced that a total of 18 distributors would be cooperating in similar programs.

The Solar Applications Branch has also sponsored or co-sponsored various information programs aimed at different sectors of the professional community. Most notable are those for the financial and housing industries. Plans have been made for a very comprehensive Valley-wide educational program.

The above projects represent the major efforts of TVA's Solar Applications Branch. ~~~ is also operating its own solar test fa- ity, operating a DOE-funded photovoltaic . gram, monitoring the Annual Cycle Energy System house in Knoxville, working with NASA on Rankine-type cooling systems, and beginning to work on wind and small scale hydroelectric projects.

Critique/analysis: TVA has had a pervasive influence on life in the Tennessee Valley since its implementation during the 30s. Initially, a resource development agency, TVA over the years became primarily a power-producing concern and its power policies shaped energy use in the Valley. Cheap electricity created demands for power that exceeded the capacity of the Valley's 30 hydroelectric dams.

Coal plants were built, followed by a nuclear program that will give the Tennessee Valley the greatest concentration of nuclear facilities in the nation. Given that background, TVA's comparatively sudden entry into conservation is of critical importance. It has been well publicized and generally well received. However, conservation and renewable programs combined still represent only a tiny fraction of the agency's efforts - about 2-3 percent in budgetary terms. And, those programs are managed not as much to reduce long-range total energy consumption as to make l management easier for the utility.

The danger represented by massive efforts by the Valley's only utility is that TVA's high visibility as a solar developer has created a sense in the Valley that perhaps others need not take initiatives for new energy patterns, that TVA will do it all. Furthermore, the slowness with which truly new programs can be implemented in a bureaucracy the size of TVA (47,000 employees) has demoralized both on the creative staff hired by the SAB and their supporters in the Valley.

Energy Conservation

In 1977, TVA implemented its comprehensive home insulation program. Working through its municipal and cooperative distributors, TVA offered homeowners free home energy audits to determine where conservation measures were most needed, followed by an offer of interest-free financing for the purchase of attic insulation. This program was the first step toward broad conservation measures, which since have become a national model.

The rationale for sponsoring the program was that residential conservation would reduce overall energy use and, most importantly, shave peak loads. The end result would be lower costs for power production.

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Renewable Resources—A National Catalog of Model Projects

Category	Utility
State	TN
Project Name	Wood Pyrolysis

Organization	Maryville College
Address	Maryville, TN 37801
Contact	Hugh Crawford
Telephone	(615) 982-5312

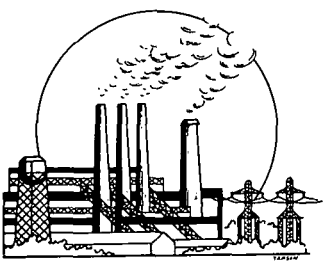
Maryville College and TVA are cooperating in a demonstration of the nation's first use of wood pyrolysis for space and water heating. Pyrolysis is a means of burning wood wastes such as hardwood shavings, sawdust and wood chips in the absence of oxygen to produce three products: charcoal, char-oil and low-Btu gas. The charcoal is a marketable by-product; the char-oil and gas will be used as replacements for oil and natural gas, which are now burned in the college's existing boiler. Maryville was chosen as the site for the pyrolysis demonstration because its existing boiler can handle high-volume, low-Btu gas. It is also conveniently situated near a facility that produces an abundant quantity of wood by-products.

TVA estimates that 800,000 tons of suitable wood wastes are produced by Tennessee Valley sawmills annually.

The pyrolysis unit has been purchased and tested. The goal was to have it fully operational and serving the school before the 1979-80 heating system ended.

Funded By	TVA and Maryville College
Cost	$350,000
Congressional District	II
Compilation Date	February 1980

Critique/analysis: Installation of the pyrolysis machine has been delayed due to modifications to assure safety and to simplify the operation. TVA plans thorough testing and analysis of the system before bringing it to the M.C. location. It has been determined that the wood waste will need to have a low moisture content, so a dryer is being designed to handle this problem.



TEXAS

1. Alief
2. Austin
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4. Canyon
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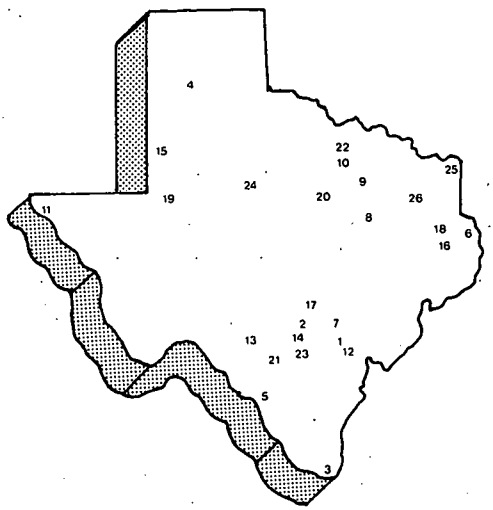
6. Center
7. College Station
8. Corsicana
9. Dallas
10. Denton
11. El Paso
12. Houston
13. Ingram
14. Kyle
15. Level Land
16. Lufkin
17. Manor
18. Nacogdoches
19. Odessa
20. Ranger
21. San Antonio
22. Sanger
23. San Marcos
24. Sweetwater
25. Texarkana
26. Tyler



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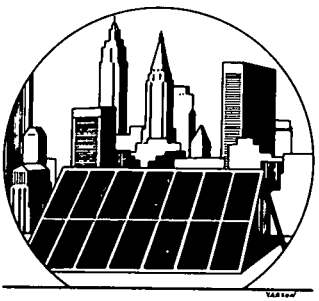
Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	TX
Project Name	City of Austin Renewable Energy Resources Commission
Organization	City of Austin Renewable Energy Resources Commission
Address	516 Terrace Drive Austin, TX 78704
Contact	Ray Reece
Telephone	(512) 447-9274
Funded By	Internal
Cost	n/a
Congressional District	X
Compilation Date	February 1980

The City of Austin has now established the Renewable Energy Resources Commission (RERC), a citizens' advisory commission that is virtually without a counterpart in U.S. cities of Austin's size. Thanks to the efforts of a coalition of solar-minded citizens and one or two City Council members, the Commission was established by city ordinance and appointed in the spring of 1979. Composed of seven members, including one woman and one Black, it represents a variety of technical and professional interests, a solar designer/installer, an employee of the state Attorney General's Office, an electrical engineer from IBM, an environmental biologist, two mechanical engineering professors, and an energy policy analyst and writer.

RERC's mandate is to advise the City Council on strategies and programs for promoting renewable energy development to the maximum extent in both the public and private sectors. In pursuit of its mandate, the RERC has met at least weekly and labored energetically to produce a pair of extensive recommendations to the City Council, both of which were formally submitted on August 9, 1979.

The first recommendation calls upon the City to designate a 44-block area of older downtown Austin currently slated for conventional "urban renewal" and redevelopment, a "Renewable Energy Development District." The RERC's proposal for a downtown "urban solar ıge" would preserve the local character and :, eventually making the District a showcase of urban applications of renewable energy resources and technologies that residents and users control. Implicit in the proposal is a carefully generated body of development guidelines for developers and builders: orientation restrictions on new buildings and other design and structural criteria. These could enable the District to meet 80 percent of its annual energy needs with renewable resources, primarily solar energy and wind. Older structures in the District would be retrofitted with solar and



conservation features aimed at achieving 50 to 60 percent energy efficiency.

The second proposal, a "Goals and Strategies" document, suggests a program of "short-term," "mid-term," and "long-term" renewable energy resource initiatives to be undertaken by the City of Austin. For example, in the "short-term" (the next two years), the Commission has proposed building code and zoning law amendments designed to encourage solar installations; city-sponsored, low-cost solar greenhouse workshops for homeowners, neighborhood coops, and small solar entrepreneurs; neighborhood economic development programs based on home-grown solar industries; solar installations on city facilities; completion of a long-term master-plan for solar, wind and biomass development in Austin; educational solar workshops and seminars for Austin's businesses and professionals; construction of "model" solar homes and other facilities for demonstration purposes; implementation of a long-term low-interest loan program, possibly administered by the city utility, for solar consumers and small producers, including "solar co-ops."

Among the "mid-term" (the next five years) objectives are locally managed solar R & D projects aimed at solving technological problems unique to the Austin area; comprehensive solar retrofit programs employing both private and public investment capital; and design and construction of "total energy systems"; quasi-experimental methane gas-production facilities, and plants for the on-site commercial and industrial co-generation of electricity from process steam.

For the "long term" (six to ten years and beyond), the RERC has suggested the construction of neighborhood scale solar-electric generating plants, the use of solid wastes as boiler fuels for heat and electricity, the further development of "total energy systems" integrated with on-site food production and small-scale manufacturing facilities, and the use of renewable energy technologies (including solar-powered vehicles) in local transportation systems.

At present, the RERC's proposals are visions of what a "Solar Age" in Austin might be. The actualization of these visions will require a continuation of public pressure and participation in City policy-making. Accordingly, RERC is taking pains to involve the community as much as possible in the formulation and promulgation of strategies and programs designed to make Austin a national pioneer in the advent of the "Solar Age."

Renewable Resources— A National Catalog of Model Projects

Category	Cities
State	TX
Project Name	El Paso Energy Office

In June of 1979, El Paso's Office of Energy Conservation undertook a year-long project to end energy waste in its municipal buildings. Its initial step has been to conduct a detailed audit of monthly energy bills. Once logged in the general account ledger, these bills allow department heads to see, for the first time, their part in the energy picture. Linked to this is an organized attempt to curtail excesses in cooling and lighting by setting thermostats and eliminating unnecessary lights.

An energy conservation team is conducting a survey on retrofitting the city's buildings, with implementation proposed as phase two if it is refunded. Implicit in all of these measures is an educational effort to increase municipal employees' awareness of energy matters. Members of the energy conservation team discuss their ideas while they conduct their survey.

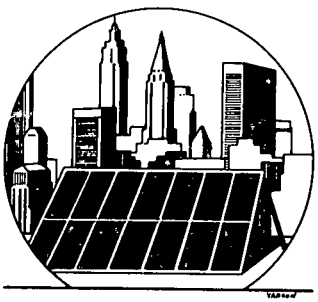
Workshops on energy topics serve a dual function, directly educating people, as well as drawing media coverage. Since publicity is not budgeted, becoming newsworthy is one of their best strategies.

Besides stimulating awareness of the need for energy conservation, the goals of this year's project are to save $150,000 in utility bills (a 750 percent return on their $20,000 grant in one year), and to develop an energy-management [illegible] Intended for statewide distribution, this [illegible]ement booklet will deal in general terms with establishing a department of energy conservation and with steps for directing an energy-efficient municipality.

Critique/analysis: If comprehensive and clearly written, this plan could be the most significant aspect of El Paso's energy program. Once common energy waste and appropriate retrofits have been documented, repeated research becomes unnecessary

Organization	City of El Paso, Office of Energy Conservation
Address	El Paso, Texas 79968
Contact	Anthony Mixer
Telephone	(915) 543-2174

Funded By	Internal
Cost	n/a
Congressional District	XVI
Compilation Date	February 1980



and programs could proceed to the implementation stages. If handled correctly, this could begin saving taxpayers' money and energy resources in other cities without the impetus of a deficit, as was the case in El Paso.

Renewable Resources— A National Catalog of Model Projects

Category	Cities
State	TX
Project Name	Energy Conservation Program

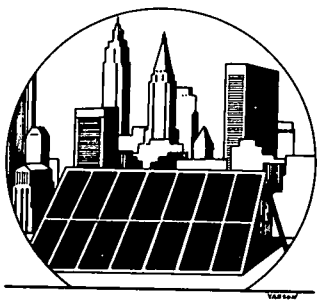
In an effort to conserve energy in Houston, the city has adopted two major strategies. One is an energy audit and conservation program for all municipal buildings. The second is the Houston Plan," which is Houston's answer to the emergency energy conservation program recently adopted by the federal government." This second move makes Houston the only city exempt from the federal regulations by virtue of having its own conservation plan accepted.

Houston's plan applies to all commercial and covered buildings in the city. Like the federal plan, it limits hot water temperatures to 105 degrees F , the Houston plan allows 76 degrees F for cooling and 74 degrees for heating. These temperature limits are supplemented, however, by a ventilation limit of 1/10 c.f.m. per square foot, and a lighting limit of two watts per square foot. One persuasive argument used to gather federal acceptance of the Houston Plan was that its implementation would result in 30 percent more energy saved than the federal plan would. Houston will monitor the results to assess compliance and actual energy savings. It will fund the program by charging a .05¢ per square foot licensing fee for commercial buildings, which should initially yield as much as one million dollars. Effective November 25, 1979, the Houston plan exempts only libraries, exhibition halls, and a few other buildings.

Houston completed an energy audit on 300 of i)0 municipal buildings. The audit become : basis of energy-conservation recommend...is to city departments and awareness campaigns for employees. Houston is now developing a computer program to analyze data on this program, and it hopes to computer-manage the heating, ventilating, and air conditioning systems in all its buildings.

Critique/analysis: At present, the conservation program is being tracked manually and results are difficult to ascertain. Funds for the

Organization	City of Houston
Address	P.O. Box 1562 Houston, TX 77001
Contact	Mary Ann Donatto
Telephone	n/a
Funded By	Internal
Cost	n/a
Congressional District	VIII
Compilation Date	February 1980



computer program have been requested from the 1980 city budget.

Houston took responsibility for its own energy consumption, neither waiting for nor relying on outside funds such as federal grants.

Renewable Resources— A National Catalog of Model Projects

Category	Cities
State	TX
Project Name	Lufkin Worm Ranch

The Lufkin Worm Ranch uses worms to process city sewage sludge, in the process producing more worms, larger worms, worm castings for fertilizer and a near-mineral soil for use in potting plants.

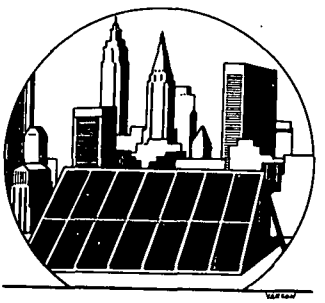
The project was inspired by the work of Ed Green, a farmer with a large earthworm farm in Shelbyville. Green discovered that his worms thrived on sewage sludge and, in August of 1977, he and his 30,000 square feet of worm beds began treating the overburdened waste-treatment system of nearby Center, a town of 5,000 people.

Now the City of Lufkin has started the first phase of its own municipal worm waste-treatment farm. They were prompted by the desire for less expensive waste treatment, more energy conservation, and the desire to transform waste into potting soil. The mayor, city council, and city management enlisted the help and advice of the Texas Department of Health, the Department of Water Resources, and the Environmental Protection Agency to ensure that the system was safe and effective. Then, armed with a $15,000 grant from the Governor's Office of Energy Resources and a $30,000 U.S. Department of Energy grant, the City bought its first 5,000-6,000 pounds of worms at $1.50/lb. to seed the worm cells, which will eventually hold 10,000 pounds of worms and process 10 percent of the city's s[illegible]. The program is already handling 5 percent of the sludge, and operating at 50 percent capacity. When fully operating it expects to save the city of 30,000 up to $65,000 per year in energy costs alone. The initial phase should require one full-time operator, with only two skilled or semi-skilled people required to eventually run the full-size farm.

The worm cells now used are covered with 12 greenhouses (totalling 22,800 square feet of earthworm culture) to protect the beds from rain

Organization	City of Lufkin
Address	Lufkin, Texas 75901
Contact	Ed Green Harvey Westerholm
Telephone	(713) 634-8881

Funded By	DOE, Governor's Ofc. of Energy Resources, City of Lufkin
Cost	$45,000
Congressional District	II
Compilation Date	February 1980



and to shade the soil. The greenhouses will be solar heated in winter and will use solar energy briefly in the summer to sterilize the residues. Shade is provided in summer by an outer layer of black plastic, inflated above the inside clear surface. The Lufkin experiment should yield reliable field data on worms' temperature- and moisture-requirements, on the level of worm-waste processing, on the amount of parasite eggs, fecal matter, etc., found.

The City is seeking more funding through the Environmental Protection Agency for both monitoring and increasing the size of the system, expecting a cost of $600,000 to process the sewage of the entire city. They are also considering selling sewage to worm farmers.

The Lufkin Worm Farm, the only one of its type on record in the United States, treats waste as a resource rather than a liability, turning it into a valuable product as fertilizer and food for worms. While the need for costly greenhouse structures is a potential disadvantage, and the economic viability of worm production as a business remains in question, by virtue of their low cost and energy savings, worms may turn out to be more valuable as waste processors than as bait.

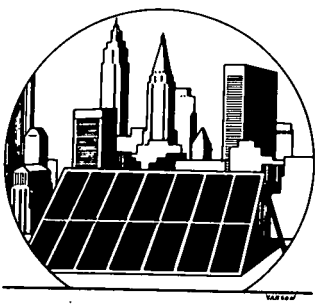
Renewable Resources—A National Catalog of Model Projects

Category	Cities
State	TX
Project Name	Texarkana Energy Coordination
Organization	City of Texarkana
Address	P.O. Box 1967 Texarkana, TX 75501
Contact	Debbie Abrahamson
Telephone	(214) 794-3434
Funded By	Internal
Cost	n/a
Congressional District	VII
Compilation Date	February 1980

The City of Texarkana, having established a position of Energy Coordinator, is taking a serious and aggressive approach to promote conservation and renewable resources. A host of programs already under way include monitoring energy consumption; giving an "Energy Savers" award for the City building with the greatest reduction in energy consumption; auditing municipal buildings; controling thermostats; and adopting a "Lights Off" policy. The city is also painting building walls lighter colors to improve their reflective qualities, applying a reflective aluminum coating on a new roof; installing solar film roll-down shades on west-side windows; using the most energy-efficient lights and fixtures available; and switching the City fleet to smaller, more fuel-efficient autos.

Energy design features used in new construction include proper building orientation, insulated glass and gable overhangs, controlled lighting levels, full wall and ceiling insulation, inner core heat design, lobby vestibules, and a minimum of glass on west walls. The recently completed library boasts two additional features: insulated precast concrete wall panels and an air conditioner condensing unit that will reduce heavy summer usage.

The city has also synchronized traffic lights which improves traffic flow and maximizes gas savings; begun a feasibility study on carpooling, vanpooling, mass transit; and ed a two-tiered, bifurcated building code. oduces a newsletter that features tips for energy savers, and on the basis of its aerial infra-red flyover/energy loss survey it provides thermograms to help interested parties determine heat loss from homes, businesses, and other structures. It is also laying an energy conservation plan, Direction '84. The plan establishes energy conservation goals, develops local energy conservation plans, identifies the programs needed to implement the plan, and creates



a system for evaluating and monitoring the progress and accomplishments of plan implementation.

These are just the beginning of Texarkana's comprehensive approach to tackling its overall energy problems. In the future, it plans to install on a soon-to-be constructed fire station, a solar system that will be color-coded to facilitate public understanding of how the system functions.

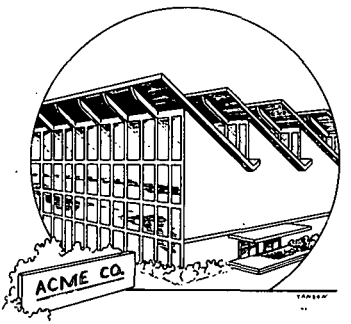
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	TX
Project Name	Building Restoration

Third Coast Productions is restoring a 12,000 square foot limestone block warehouse (vintage 1902) for use as offices and studios. The architects are dividing the interior space into public space, offices, and studios, with the wishes of the future tenants in mind. In addition to preserving an architecturally significant building, the project will provide office and studio space at low cost through bank loans and client fees.

The project will test a hybrid of HVAC (heating, ventilating and air conditioning) and passive systems, including an earth-air heat exchanger for climate control in public spaces. Mechanical units will maintain constant temperature in studios where sensitive equipment requires stricter climate control. The restored warehouse will provide an example of how commercial space can be provided energy efficiently.

Organization	Third Coast Studios
Address	501 East IH 35 Austin, TX 78702
Contact	n/a
Telephone	(512) 478-8585
Funded By	Client fees and lending institutions
Cost	n/a
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

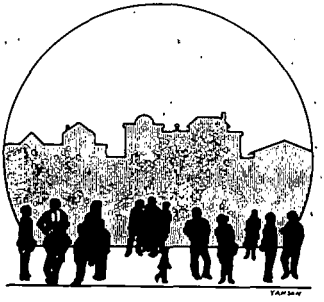
Category	Community
State	TX
Project Name	Environmental Children's Home

The Hill Country Youth Ranch is a non-profit corporation that provides homes for abused or homeless children. The residents are involved in building their own shelter and growing their own food. Currently, the ranch has a passive solar lodge, and a community center in which a locally donated site-built active collector heats the building's water.

Earth-materials research was conducted and the lodge prototype was designed by the Center for Maximum Potential Building Systems.

One hundred fifty bee hives supply honey and a small income. Plans for a large co-op greenhouse are in the works, as are plans for wind generated electricity.

Organization	Hill Country Youth Ranch
Address	Box 67 Ingram, Texas 78025
Contact	Gary Priour Bob Boerner
Telephone	(512) 367-2131 (512) 367-2545
Funded By	Private Contributions
Cost	$1,900,000 (projected 5-year)
Congressional District	XXI
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	TX
Project Name	Rainbow

Organization	Rainbow
Address	Rt. 1, Box 747 Sanger, Texas 76266
Contact	Bob and Ruth Foote
Telephone	(817) 458-3865

Funded By	Private Contributions
Cost	n/a
Congressional District	XXIV
Compilation Date	February 1980

A new community, designed to be cooperative, ecologically responsible and largely self-sufficient, RAINBOW, is forming in Denton County. Ultimately to be shaped by the owner-members, some of the possibilities and visions shared by those who are initiating RAINBOW include individual freedom and community cooperation, community-owned food production, and energy self-sufficiency.

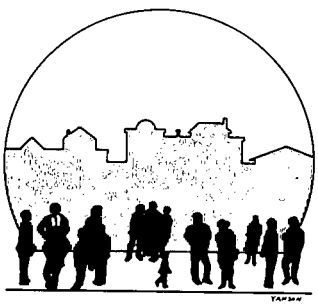
The energy goal is to be totally energy self-sufficient. Moving intentionally in this direction requires responsible citizenship, careful stewardship of Earth's resources, and greater individual economic and political independence and security.

RAINBOW will make use of readily accessible public utilities at first, but will as rapidly as possible develop and use alternate energy resources and systems (solar, wind, wood, water, and bio-gas fuels) and electrical generation, as well as a community water supply and waste disposal/recycling system.

RAINBOW aims to encourage and assist people in designing and building residential structures which are low cost, energy efficient and resource responsible. Structures should also be asethetically and ecologically harmonious with the rest of the community--human and natural. Building and zoning codes will be developed.

Private and corporately owned businesses, age industries, stores, and shops all represent possibilities for economic development. Some will earn their income from outside the community, some within.

A school, fish ponds, parks, recreation facilities, rental apartments for students, work interns and guests are all possibilities. Decisions on everything except the original layout of lots will be determined the the RAINBOW Owners Association.



Renewable Resources—A National Catalog of Model Projects

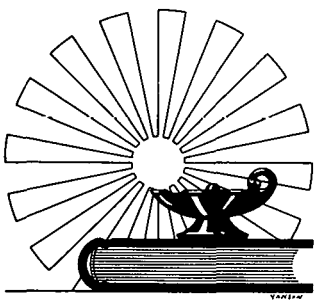
Category	Education
State	TX
Project Name	ACT Newsletter
Organization	Appropriate Technology Network Newsletter for Texas
Address	612A West 33rd St. Austin, TX 78705
Contact	Bill Garfield
Telephone	(512) 459-5984
Funded By	Private donations
Cost	n/a
Congressional District	X
Compilation Date	February 1980

The idea for the ACT Newsletter was born at a recent alternative energy gathering in Austin. Because the sharing of knowledge and experience occurs only haphazardly, the bi-monthly publication is designed to disseminate information among people interested and/or active in appropriate technology.

Since May '79, three newsletters have been sent to 600 people whose names are on a mailing list compiled from attendee lists from several energy conferences around the state. At present, the newsletter's staff of ten is developing a system for gathering articles from all parts of the state. Articles cover a wide range of practical information useful to both novice and expert.

ACT focuses on educating people rather than crusading for a particular political cause. Bill Garfield of the ACT staff noted, "The strength of the ACT newsletter lies in its ability to facilitate communication between people on a statewide level, who tend to be very independent and very local in orientation. Valuable information is being transferred which, through previous informal networks, may never have reached interested recipients."

The first three issues of ACT newsletter were paid for by registration fees from an alternative energy conference and produced by voluntary labor. However, from now on a $6.00 annual subscription fee will be charged.



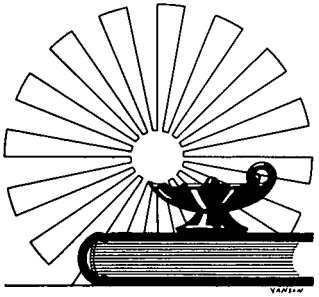
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Alternative Energy Institute
Organization	West Texas State University
Address	Box 248 Canyon, TX 79016
Contact	Dr. Vaughn Nelson
Telephone	(806) 656-3904
Funded By	TX Energy & Natural Resources Advisory Council; DOE; State of Texas
Cost	$350,000 two-year grant
Congressional District	XVIII
Compilation Date	February 1980

The Alternative Energy Institute (AEI) is an institute primarily concerned with studying and developing wind energy devices. In July of 1979, it published (with funds from the Texas Energy Advisory Council) an excellent treatise, "A Consumer's Guide for Wind Energy in Texas." Beneficiaries of abundant regular winds, residents of west Texas, north Texas, and the state's coastal area will find this book invaluable. It covers the practical applications of wind energy, features maps and charts on the economics of wind systems in Texas and the wind conditions throughout the state. It also includes calculations of the average annual output for 16 commercially available machines for the different regions of Texas.

Publication of the consumer's guide is only one phase of AEI's work with wind energy. It is field-testing prototype (and first production model) wind systems in at least four locations, in one case cooperating with the U.S. Department of Agriculture on a wind-assisted irrigation system.

The Institute, with the help of Rural Electric Coops, is also monitoring wind characteristics in north Texas and New Mexico.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	ARKWORK

Denton County Arkwork is a non-profit organization and program conducted by people of Denton County to help citizens cope with the rising energy-economic-ecologic crisis.

The purpose of Arkwork is to provide information, experimental models, and practical demonstrations of lifestyle and resource uses, summarized in the motto: "Ecological Living with Appropriate Technology." The Arkwork program offers opportunities for learning and sharing practical information on ecological living with appropriate technology in Denton County.

Public meetings are held every fourth Sunday at various locations. These meetings feature informal presentations, information sharing and fellowship, and usually, a covered-dish meal.

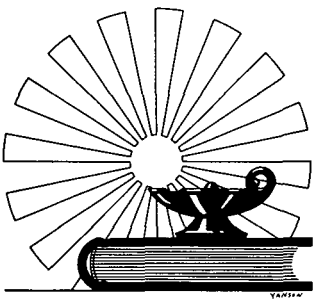
Denton County Arkwork Review is a quarterly publication of ideas and information. Free to members, it costs fifty cents on Denton County newstands.

The Free University of Denton cooperates with the Arkwork program, providing public classes and workshops on such subjects as simple, low-cost energy systems such as solar, wind, wood, bio-gas; energy-efficient construction, renovation, and landscaping; and others.

Arkwork also maintains a list of resource people willing to give informative presentations to groups within the county. Programs on specific aspects of Arkwork, as well as general concepts, are offered.

The Arkwork program is financed by memberships and donations. Some funding from government and foundation programs has been requested, but most of the people of Denton County believe they can solve their own energy problems with little outside aid or interference.

Organization	ARKWORK
Address	Box 13615 NTSU Denton, Texas 76201
Contact	Dale Branum
Telephone	(817) 464-3155
Funded By	Membership dues, Donations
Cost	n/a
Congressional District	XXIV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	A.T. Small Grants Program

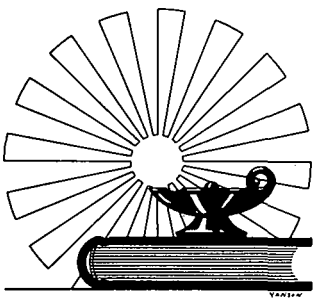
For the fiscal year 1980, Congress has appropriated over $12million for the small grants program under the direction of DOE's Assistant Secretary for Conservation and Solar Applications. The purpose of the program is to encourage the development and demonstration of (and the dissemination of information on) energy-related ideas that minimize the use of non-renewable resources or technologies or processes that are not environmentally sound, encourage the use of local materials and labor skills to satisfy community needs while increasing self-reliance and energy understanding, and use new technologies and/or novel or scaled-down applications of existing technologies to create durable and recyclable systems that are simple to install, operate, and maintain.

Individuals, local non-profit organizations, local non-profit institutions, state and local agencies, Indian tribes, and small businesses are all eligible.

The three major types of projects considered for funding are idea development, concepts, testing and demonstration. The first covers new concepts using known energy sources or proven procedures simplified by new ideas. Awards of up to $10,000 will be made for proposals that demonstrate the value of an idea but require further development to define the concept or show substantial technical improvement. "Concepts testing" projects revolve around ideas now ly for testing. Grants in this category will exceed $50,000. Demonstration projects develop technologies that have been tested but remain to be proven through actual use. Funding for any one project cannot exceed $50,000.

If a project warrants further funding after an original grant has been exhausted, it will compete for additional funding from the regular program funds. Regional offices are supposed to assist in finding venture capital.

Organization	Dept. of Energy, Regional Office, Region VI
Address	P.O. Box 35228 Dallas, Texas 75235
Contact	Chuck Royston Guntis Terauds
Telephone	(214) 767-7777
Funded By	DOE
Cost	$50,000 2-year
Congressional District	State-wide
Compilation Date	February 1980



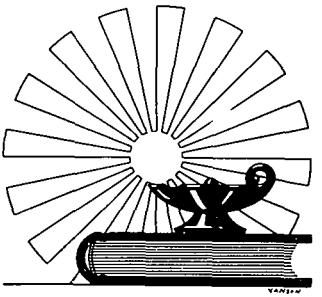
Critique/analysis: These programs in Texas have concentrated on technical approaches; more thought needs to be given to information dissemination and to preparing people to accept the new ideas as they are proven out.

Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Northeast TSEA

Combining interests in appropriate technology with active systems, Northeast Solar Energy Association holds bimonthly meetings. It is currently assembling a series of "hands-on" community workshops. Both passive and active workshops will be conducted on weekends at monthly intervals. Attempting to be self-supporting the group has not requested outside funding.

Organization	Northeast Texas Solar Energy Association
Address	Tyler, Texas 75701
Contact	Judy Basehore
Telephone	(214) 852-6755
Funded By	Membership dues
Cost	n/a
Congressional District	IV
Compilation Date	February 1980

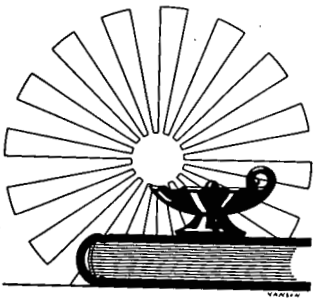


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	One-Way Heat Shield

This project to develop a one-way heat shield is funded by a $12,090 DOE Small Scale Appropriate Technology Grant. The heat shield being developed will permit radiant energy to pass through in one direction only. In the winter the shield can be positioned so that outside radiation can enter a structure and provide heat, while the shield will prevent heat from being radiated out of the structure. During the summer the shield can be reversed, permitting radiant energy to leave the structure but not enter it, thus cooling the building.

Organization	One-Way Heat Shield
Address	4828 Canyonbend Circ Austin, TX 78735
Contact	Laura S. Duncan
Telephone	(512) 892-1822
Funded By	DOE
Cost	$12,090
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Porta Lab Earth Materials

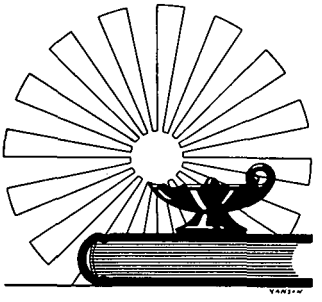
For the past several years, Howard Scoggins, director of Porta Lab, has been researching and developing methods for using indigenous southwestern earth materials, such as adobe and caliche, in low-cost construction projects. Several of Scoggins' innovations for stabilizing and strengthening such materials have now been patented.

With a recent DOE grant for $20,000, Scoggins will focus on Porta Lab, a mobile soil-engineering lab for prospecting and testing of earthern structural components. The mobile lab is designed to be the first low-cost application of state-of-the-art soil-engineering science in earthen building construction.

The program's goal is to make material predictability a known constant in the total process--from raw materials to design element--of earthen/solar construction.

Howard Scoggins, a former brickmason and political activist, sees his Porta Lab project as a means of combining his interest in social equity and community self-reliance with his skills as a builder and technical researcher. Scoggins' project is oriented toward the use of local and recycled building materials. In general, the earth-materials building technologies are best suited for passive solar applications, which are labor-intensive, relatively simple to understand and execute, and therefore amenable to participation by community residents. This type of construction provides local, neighborhood, and individual autonomy in relation to the building environment.

Organization	Porta Lab
Address	1706 Karen Avenue Austin, TX 78757
Contact	Howard Scoggins
Telephone	n/a
Funded By	DOE
Cost	$20,000
Congressional District	X
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

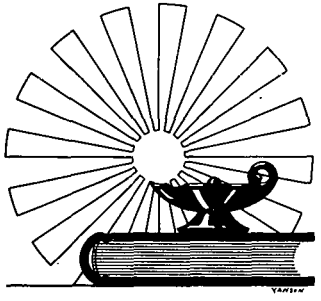
Category	Education
State	TX
Project Name	Programs in Architectural Topics

In conjunction with the University of Texas, a number of programs and workshops in architectural topics will be held from November 15 of 1979 to August 22 of 1980. While these programs are all energy-related, one program led by Dr. Francisco Arumi, "Thermal Inertia in Architectural Walls," is particularly noteworthy.

Dr. Arumi designed a computer program that will make it possible to design buildings that consume less energy. Dynamic Energy Response of Buildings(DEROB) is one of three programs chosen by the Department of Energy to establish the DOE Building Energy Performance Standards. These standards are to be used in conjunction with a federal law that requires local governments to require those seeking building permits to adopt energy-saving standards.

The DEROB program will provide information for evaluating a building's energy performance prior to its construction and will be available to the public. By providing a detailed description of the building to DEROB, one could find out if the building would meet energy-consumption standards and, if not, redesign it.

Organization	The University of Texas at Austin
Address	Austin, Texas 78712
Contact	Lynn Cooksey
Telephone	(512) 471-3123
Funded By	DOE
Cost	n/a
Congressional District	X
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Solar Education and Retrofits

Organization	Navarro College
Address	P.O. Box 1170 Corsicana, TX 75110
Contact	Charles G. Orsak Dr. Arthur C. Meyers, III
Telephone	(214) 874-6501

Funded By	Private Foundation Grants; HUD; State Funding Agencies
Cost	$1,975,000
Congressional District	XIII
Compilation Date	February 1980

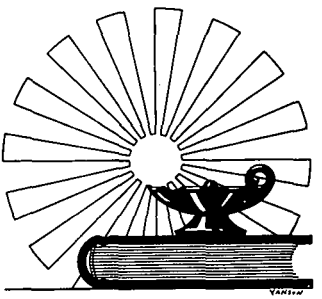
Navarro College has pursued weatherization, solar retrofit and training, education, and research through grants from the Department of Energy, the Texas Education Agency, the Department of Housing and Urban Development, and the National Science Foundation, first studying the feasibility of solar for a community college through a 12-month, $20,000 Texas Education Agency grant.

Researchers and consultants, along with Navarro's community advisory council, decided that solar-related technical education at the mechanic/installer level was feasible for their curriculum. A $234,000 grant from the Department of Energy was used to assess manpower and skills needs on a national scale. Slide shows, newsletters and magazine articles have been utilized to disseminate information on this grant project.

HUD and Navarro College funded a $35,000-plus, 12-month project that now provides solar heated water to a 48-person dormitory. It used no recycled materials and the construction was done by the local maintenance crew and students (all non-union and/or volunteer). Specified savings and results are not clear at this time, but the system can be adapted to provide space heating. The college has used newspaper articles, newsletters, magazine articles, and slide shows to spread the word about this project.

A three-year project supplying geothermal water and limited space heating to the student union building and Memorial Hospital was funded by private foundation money ($70,000) and a DOE grant ($850,000). This project used little in the way of recycled materials, local employment, or skill-sharing.

A 12-month, $89,000 grant from Texas Education Agency was obtained to train secondary, post-secondary, continuing education, and vocational students in energy conservation techniques, measures, and theories. Local instructors



are paid to teach eleven modules, which can be integrated into existing secondary and post-secondary vocational programs and used as adult/continuing education courses, or can be used collectively as a course. Recycled materials are used in the insulation and retrofit activities, and skills are shared in the educational process.

A certificate program to train solar mechanics/installers is provided through a combination of a one-year $27,000 TEA grant and college funds. This one-year curriculum is an alternative to heating, ventilating, or air conditioning programs. It features on-the-job training and skills-sharing. The laboratory is funded in part by local funds, and recycled materials are used for homemade collectors and insulation. Television and commercial radio were added to other media used to promote these solar and appropriate technology-related projects.

The college offers an A.A. degree for solar technicians. A $600,000, 36-month National Science Foundation grant was provided as part of a national effort in solar technician training. On-the-job training brings students into contact with solar contractors who are potential employers. Recycled materials are used for homemade collectors and insulation, and construction, electrical engineering, plumbing, and HVAC-related skills are shared.

Critique/analysis: Navarro College is in an ideal position to demonstrate to the community at large the applicability of solar as an alternative energy source. However, the potential of low-income families and the elderly benefiting from this expansive body of knowledge has not been realized.

Renewable Resources—A National Catalog of Model Projects

Category Education

State TX

Project Name Solar Vocational Training

Tanger Junior College has an active solar vocational training program. Eight students have completed the training, and five are enrolled for next semester.

Three short courses held for the community at large are generating interest in agricultural uses of solar.

Critique/analysis: The main problem is a lack of interest from the general public and Jr. College students. Equipment wasn't received before the middle of the second semester due to a long lead-time in disbursing funds. Another stumbling block was the lack of a good text in simple layman's terms, but the currently used EDA-sponsored text of Colorado State University is very effective.

Organization Ranger Junior College

Address College Circle
Ranger, TX 76470

Contact Alton Stiles

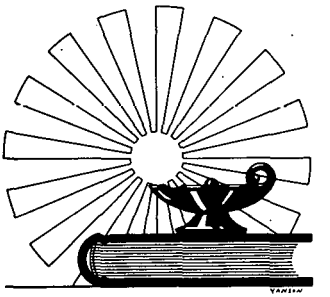
Telephone (817) 647-3234

Funded By Texas Education Agency
DOE

Cost $20,000

Congressional District XVII

Compilation Date February 1980

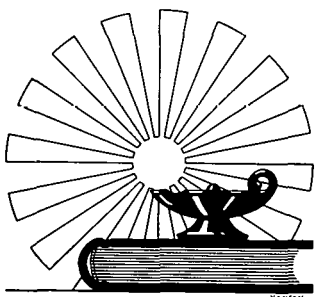


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Solar Mechanics Course
Organization	Texas State Technical Institute
Address	Rte. 3 Sweetwater, TX 79556
Contact	Ronnie Freeman
Telephone	(915) 235-8441 ext. 55
Funded By	n/a
Cost	n/a
Congressional District	XVII
Compilation Date	February 1980

"Solar Mechanics" a course at Texas State Technical Institute, is aimed at training solar technicians. Taught as an extension of the Cooling Systems Program, it familiarizes students with solar radiation fundamentals, solar collector design and installation, solar load calculation and heat storage, and solar controls. The emphasis of the course is to provide practical "hands on" experience to students, who visit sites where systems are installed and become aware of numerous retrofitting techniques. In addition, the Institute switched to solar-generated power in many areas on campus, calling upon this class of future mechanics to help repair, and modify the systems they are employing.

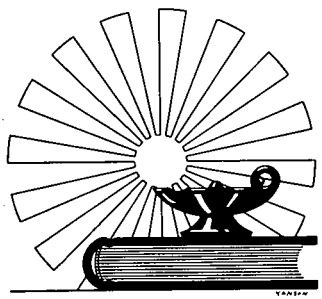
Roughly 90 percent of the first year's enrollment in the solar energy mechanics course have already found work in this field within Texas. Consequently, TSTI's other three campuses are preparing similar courses and have called upon Sweetwater for teachers and advice.



Renewable Resources—A National Catalog of Model Projects

South Plains Junior College offers vocational training in active solar through refrigeration and air conditioning curriculum. The training program was developed with Department of Energy funds administered through Texas Education Agency. Beginning in spring of 1980, thirty students per semester will take the training course.

Category	Education
State	TX
Project Name	Solar Training for Building Trades
Organization	South Plains Junior College
Address	Level Land, TX 79336
Contact	Steve Stephens Wayne Young
Telephone	(806) 894-9611
Funded By	Texas Education Agency
Cost	$19,000
Congressional District	XIX
Compilation Date	February 1980



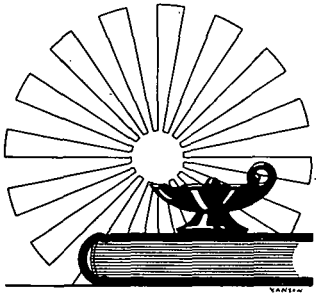
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	A Study on Institutional Barriers to Solar
Organization	LBJ School of Public Affairs, Univ. of TX
Address	Austin, Texas 78712
Contact	Prof. Marlan Blissett
Telephone	(512) 471-4962
Funded By	DOE
Cost	$62,000
Congressional District	X
Compilation Date	February 1980

This year-long study by a graduate-level public policy seminar at the LBJ School attempts to come to terms with institutional barriers to the implementation of on-site solar energy technologies in the United States.

Besides providing a "Technology Assessment", the LBJ study group examines the "Solar/Institutional Relationships" for each technology or problem under consideration, and then recommends a series of "Incentives for Solar Commercialization." Considered in the study are "Federal Intervention in the Solar Market," "Electric Utilities and the Adoption of On-Site Solar Technologies," "Workers in the Solar Industry," "Solar Access," and "Building Codes and Standards." As might be expected, the LBJ study so far has stretched into three full volumes of written material.

Critique/analysis: Because it is a class project, the LBJ study has not resulted in community participation. Unfortunately, because the study is lengthy and academic, it is also not likely to reach state and local government officials and other decision-makers. However, the study has evidently had a lasting positive impact on many of the participating students, some of whom are doing solar-related policy studies for the Austin Renewable Energy Resources Commission. The LBJ study has made solar energy policy analysis a concern of many graduate students intending to enter public affairs and management positions.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Texas Mobilization for Survival

Organization	Texas Mobilization for Survival
Address	1022 West 6th Street Austin, TX 78703
Contact	Lynn Hayden Sammie Ritter
Telephone	(512) 474-5877

Funded By	Donations
Cost	n/a
Congressional District	X
Compilation Date	February 1980

The Texas Mobilization for Survival (Mobe) was started in August, 1977 as a local chapter of the National Mobilization for Survival. It took on the same general goals of the national organzation: to end the international arms race, ban all nuclear weapons, stop nuclear power production, direct funds to meet human needs, and promote solar energy and other appropriate technologies.

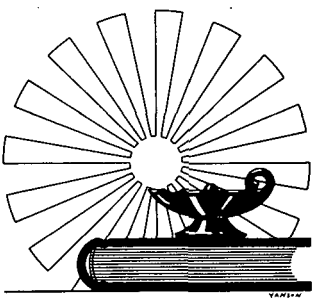
The main functions are research in the areas of local and state energy utilization; education through a speakers bureau, newsletter, ("Hot Times" with a circulation of 7500), radio talk shows, public forums, pamphlets, and outreach to legislators and other public officials; and mass actions mobilizing large numbers of people to demonstrate concerns about nuclear power and weapons. In addition, the Mobe has sent travelling organizers to present workshops in other cities.

The first project was to educate members fully in energy issues and provide a community forum at the University of Texas. The Mobe's long-term goals include directing Austin out of the South Texas Nuclear Project and onto a path of conservation and safe power generation.

The Mobe's funding comes from contributions, the sale of T-shirts, buttons and literature, benefit concerts, speakers' fees, and newsletter subscriptions.

The Mobe has been effective in making nuclear power and alternative energy issues prominent in Austin. It is able to quickly inform and gain the support of specific groups on vital energy issues.

Critique/analysis: Inexperience remains a weakness. While mobilizing support in the liberal community has proved a well-met challenge, other areas--particulary Austin's minority communities--have shown little interest in the Mobe's work.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Texas Solar Energy Society

The Texas Solar Energy Society was established in 1976 as a statewide membership organization devoted to education, research, development, and information-dissemination on all aspects of solar and allied renewable energy resources. Headquartered in Austin, the Society has grown to a present membership of more than 400. It has also developed a statewide "network" of seven affiliated local chapters.

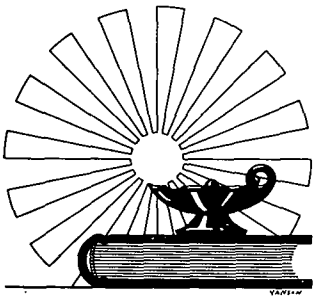
Russel Smith, Executive Director of TX-SES, administers the business of the Society under the jurisdiction of a 12-member board-of-directors. Among the services of the Society are a quarterly membership newsletter and technical bulletin, two semi-annual statewide conferences, local chapter formation and advisory services, and a steady series of smaller conferences, seminars, and workshops aimed at both the professional solar community and the general public.

The most recent and ambitious of the Society's programs is a 10-month, nine-city series of two-day workshops on "How To Build With Solar Power." Covering both active and passive solar technologies and concepts, these workshops have drawn capacity attendance from do-it-yourselfers, building contractors, architects, engineers, utility officials, bankers, and others. By November of '79, they had attracted nearly 1500 participants. The workshops are being funded by the Governor's Office of Energy Resources under an 11-month, $115,000 contract.

Following completion of the workshop, the Governor's Office of Energy Resources and TX-SES sponsored a statewide conference in Austin December 6,7,8 called "Texas Solar Realities 79." The principal objective was to highlight 38 Texas solar energy projects that had generated sufficient performance data to be rated.

Organization	Texas Solar Energy Society
Address	Suite 359 1007 S. Congress Austin, TX 78704
Contact	Russel Smith
Telephone	(512) 443-2528

Funded By	Governor's Office of Energy Resources
Cost	$115,000
Congressional District	X
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Trinity University Solar Project

Trinity University has been involved in several renewable energy projects. First, it attempted to heat, cool, and produce hot water for seven campus buildings; then 16,000 square feet of concentrating, tracking collectors were installed on the large rooftop of a campus building and connected to an existing HVAC system that included a 350-ton gas absorption chiller. The system meets about 75 percent of the space- and water-heating needs of the seven buildings, and somewhat less of the air conditioning requirements.

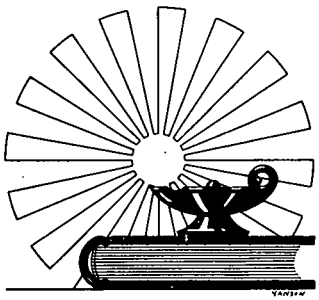
Initially, the project had a Site Data Acquisition System, but that has been abandoned. The system experienced the problems typical of those with the tracking collectors, but the devices did receive regular maintenance. Recent modifications to the tracking mechanisms have improved reliability, and the system provides students with a working model for classroom sutdies.

The Solar Energy Meteorological Research Program is designed to provide, for the first time, accurate and detailed information about solar radiation in Texas, Louisiana, Arkansas, Missouri, Kansas, and Oklahoma. Trinity monitors instruments around the clock using a computer data center, and receives other data from an airplane, a mobile van, from several other universities, and from the U.S. Weather Service. Data is sent to the National Climate Center in A lle, North Carolina, for analysis. Event- u a series of handbooks, cassette tapes, and films containing climatological study results will be produced for engineers, architects, homebuilders, and policymakers. The program also provides experience to graduate students in solar engineering.

Another of Trinity's projects, just getting under way, is a Passive Solar Test Facility, consisting of two 800 square foot test houses and monitoring equipment. The facility will test several passive structures and materials for

Organization	Trinity University
Address	715 Stadium Dr. San Antonio, TX 78212
Contact	Dr. John E. Rudzer, Jr.
Telephone	(512) 736-7505

Funded By	Ener, Res. & Dev. Admin., Trinity Univ., DOE
Cost	$2.9 million
Congressional District	XX
Compilation Date	February 1980



their suitability to a hot, humid climate, and evaluate them for initial cost, running cost, maintenance, and consumer acceptability. The project features a very flexible test facility, high-quality monitoring devices, and an excellent data processing/modelling facility. The value of the project lies in reducing peak demand from air-conditioning through the use of passive technologies. Of course, widespread adoption depends on informations dissemination, so the project intends to produce design manuals for developers, builders, owner-builders, and architects.

Renewable Resources— A National Catalog of Model Projects

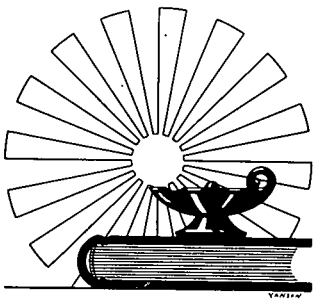
Category	Education
State	TX
Project Name	Underground

Underground is a program designed to make the concepts of appropriate technology familiar to a wide variety of individuals, firms, and lending institutions. With an annual budget of $9,000 from private contractors and lending institutions, Underground works with local builders, developers, and do-it-yourselfers.

The techniques demonstrated are specifically designed for an unskilled labor force and to provide models for economic, environmentally sound construction. These techniques include rock beds for drainage, energy storage, dehumidification, passive solar design, and greenhouses. Also, Underground has worked with architectural obstructions in the wind stream and landscaping to aid in natural ventilation and to lower convection heat loss.

Local materials are used where feasible, in addition to scrap from construction sites or building demolitions. Planning is done in a trans-active style with volunteer workers.

Organization	Underground
Address	1031 Walton College Station, TX 77840
Contact	John Whiting
Telephone	(713) 696-6466
Funded By	Private contracts & lending institutions
Cost	$9000 annually
Congressional District	VI
Compilation Date	February 1980

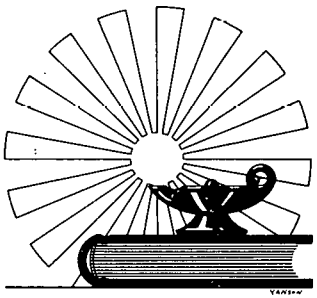


Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Wind Power

Bill Loftin is developing his own self-financed wind system in San Antonio. He expects it to generate from 12,000 to 14,000 KWH per year. Plans call for a synchronous generator that can run in parallel to the municipal electric grid and pump energy back into the municipal system when generation exceeds on-site usage. This project, now 60 percent complete, has relied entirely on used components.

Organization	Loftin Marginal velocity Suburban Aerogenerator
Address	206 Patricia San Antonio, TX 78216
Contact	Bill Loftin
Telephone	(512) 344-7568 (512) 227-3211 ext. 472
Funded By	Individual
Cost	n/a
Congressional District	XX
Compilation Date	February 1980



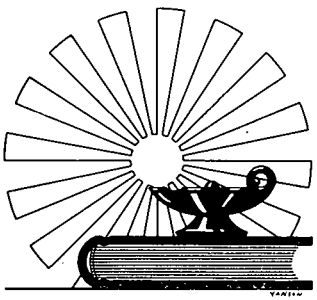
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Winter Garden Appropriate Technology
Organization	Community Services of Frio, La Salle, & Dimmit Counties
Address	P.O. Box 488 Carrizo Springs, TX 78834
Contact	David Ojeda, Jr.
Telephone	(512) 876-5219
Funded By	HUD, Comm. Dev. Block Grant Program/CSA
Cost	n/a
Congressional District	XXIII
Compilation Date	February 1980

Appropriate technology has flowered in the Winter Garden area between San Antonio and the Rio Grande River primarily because of the efforts of Community Service Agency (CSA) of Frio, La Salle, and Dimmit Counties. CSA's program has centered around solar demonstration projects and weatherization work. Operating with $8500 per year from HUD and CSA grants, it has utilized CETA workers and coordinated activities of the region's city and county governments. The main target audiences--the rural poor, the elderly, and neighborhood organizations--have been reached through conferences, media, and public meetings. Local radio, TV, and newsletters have also been used to spread the word about the agency's work.

The long-range goal of the agency is to enable area residents to be independent of the energy companies currently supplying the region. The agency's most striking project is the repair of a home in Carrizo Springs (with funds from the HUD Community Block Grant Program) and the installation of a $2000 solar greenhouse to the home. The greenhouse, built by CETA crews, can be converted via the removal of panels into a porch during summer. Mass for heat storage is provided by river bottom rocks placed inside the greenhouse. A water drip-cooling system also helps the rock mass to cool in the summer. Additional features are solar hot water heaters and a drip-cooling system on the false roof.

Future plans for the agency include two more solar greenhouses, using adobe for mass, and a continuation of the program that weatherized 90 homes last year.



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	TX
Project Name	Women of Faith

The Women of Faith is an interdenominational group of women drawn from Houston synagogues, from Catholic and Protestant churches, and from women not affiliated with any particular church. During the summer the group sponsored an Energy Conservation Awareness Day to introduce people to conservation and energy alternatives--options from nuclear to solar. Keynote speakers included Dr. McKetta from the University of Texas on nuclear and Lola Redford on solar. These lectures were backed up by seven workshops.

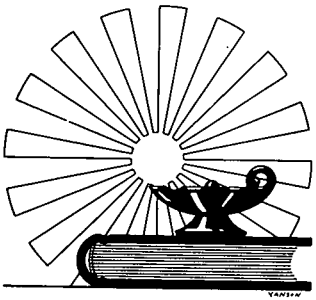
The conference drew about 200 people from the ranks of homemakers, church-goers, public and social service groups, corporate representatives, professionals, etc. The intent was to encourage people to implement conservation, alternative energy programs and workshops back in their own communities.

The group has compiled a list of potential speakers and helps other groups find people who might help local programs. For example, it encouraged Church Women United to plan a seminar on energy. The group got good media coverage and eventually extensive support from Houston Lighting and Power, the Texas Energy Extension Service, Panhandle Eastern Pipe Line Company, Houston Metropolitan Ministries, Exxon, Shell, a number of churches, individuals and many others. This provided $6,000 to pay for the space, speakers and refreshments.

Critique/analysis: Although it is encouraging to see efforts of this kind which rely entirely on local monies, the effort involved was clearly not something to take on lightly, and it is still not clear if the organizers feel it was worth the effort. It remains to be seen if others in Houston will help ease the work load and give a boost of enthusiasm, moral support and human energy to this first effort.

Organization	Women of Faith
Address	c/o Anti-Defamation League, 4211 Southwest Freeway #209 Houston, TX 77027
Contact	Helen Wills
Telephone	(713) 627-3490

Funded By	Contributions
Cost	$6,000
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

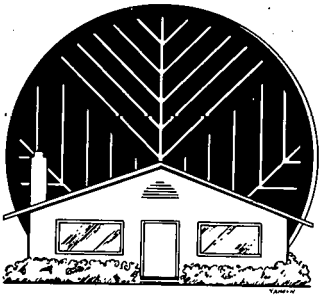
Category	Housing
State	TX
Project Name	Architectural Design Competition

The design for ENARCHITEX's passive solar home in College Station was among the winners of HUD's Cycle 5 "Passive Solar Design Competition". A local builder and designer are responsible for executing the project. Completion of the house will benefit everyone, according to the designer, because the house will demonstrate to local contractors, banks, architects, and homeowners that passive solar homes are feasible and desirable.

Critique/analysis: Built with non-union labor, the house does not feature recycled materials. The $75,000 cost has put this home out of many people's reach.

In promoting the solar house, the designer has found "newsletters" to be his most effective medium.

Organization	ENARCHITEX
Address	College Station, TX 77840
Contact	Paul Woods, Texas, A&M University
Telephone	(713) 845-3211
Funded By	Housing & Urban Development
Cost	$75,000
Congressional District	VII
Compilation Date	February 1980



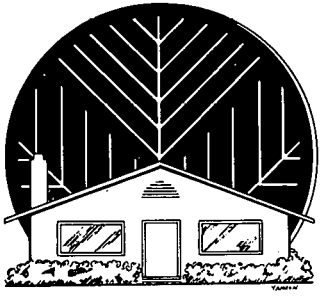
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	TX
Project Name	David Venhuizen House
Organization	David Venhuizen House
Address	Kyle, Texas 78640
Contact	David Venhuizen
Telephone	n/a
Funded By	Owner-financed
Cost	n/a
Congressional District	X
Compilation Date	February 1980

Much of the value of this innovative passive solar heating and cooling system derives from its retrofit onto a house constructed before the turn-of-the century. Since the house is located in central Texas, its relative antiquity entails both advantages and disadvantages in terms of solar/conservation retrofit.

A disadvantage is high ceilings and voluminous attic space, which function as "heat-traps" on hot summer days and nights. An advantage is that the house faces southeast, with a wrap-around front porch that has been partially converted into a permanent attached solar greenhouse. A second advantage is an ample crawlspace beneath the house, which the owner has converted into a surface kinetic earth-air heat exchanger. By sinking a skirt around the house to a depth of several feet underground, the owner-designer hopes to isolate the earth beneath the crawlspace from the temperature fluctuations of the earth beyond the house. Keeping the earth directly under the house at a relatively constant 68 degrees F permits the use of the crawlspace as the major heating/cooling component in a fan-assisted convective loop. In winter, the unshaded greenhouse will feed additional warmth into this loop while also storing heat in its water-barrel storage tanks and thick slab floor.

Critique/analysis: According to the designer, any demonstration of passive solar technology that carries the potential for displacing the use of non-renewable energy is a valuable tool for showing the public that it needn't be clipped to stay comfortable.



Renewable Resources—A National Catalog of Model Projects

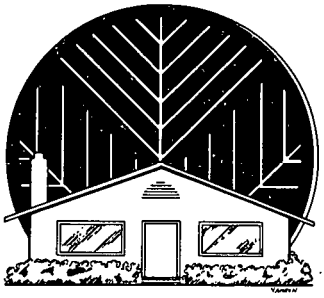
Category	Housing
State	TX
Project Name	Reck Residence

The Reck residence attempts to maximize the use of solar technologies in an urban residential setting. It will easily be one of Austin's most interesting and energy-efficient homes.

Funded through a bank loan, the Reck residence utilizes combinations of active and passive systems. With the construction of a greenhouse, the residence will be better able to meet seasonal heating and cooling needs, as well as produce food year round. Coupled with the greenhouse is a water-distillation unit and a solar crop dryer. A thermo-siphoning flat-plate collector will provide hot water for the home.

One of the most exciting highlights of this design is the utilization of an earth-air heat exchanger coupled with thermal mass for seasonal storage. Earth-air exchangers have been little-used in Texas but offer hope for very economical heating and cooling.

Organization	Reck Residence
Address	6012 Mountain Villa Austin, TX 78731
Contact	Greg Watkins
Telephone	(512) 458-2025
Funded By	Bank loan
Cost	$80,000
Congressional District	X
Compilation Date	February 1980

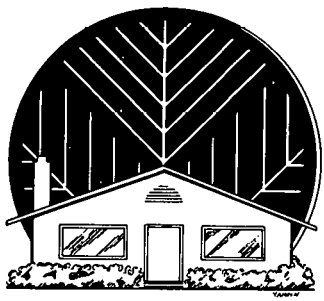


Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	TX
Project Name	Solar Heated Home

Tim Whitington added a room or two to his primarily wood-heated house and plans to heat the additional rooms with solar, either with an attached greenhouse or a collector system to be attached to an active, air-medium, rock-bed storage heating system. His own designer and builder, he uses recycled and locally purchased materials. So far, he has spent $300. Tim hopes to be an example to others in his community of what can be done with a little money, ingenuity, and exploration into the many possibilities provided by such renewable resources as the sun and wood.

Organization	Tim Whitington
Address	13133 Old Gregg La. Manor, TX 78653
Contact	Tim Whitington
Telephone	(512) 251-4863
Funded By	Self
Cost	n/a
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

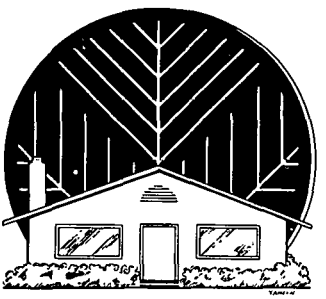
Category	Housing
State	TX
Project Name	Solar-Heated Quadraplex

This solar-heated quadraplex in the Texas panhandle will combine active and passive solar techniques with maximum conservation measures. The project is providing construction work and some training in solar technologies for local laborers and craftsmen, though it is a non-union job. For framing, it incorporates recycled steel salvaged from a neighboring Air Force base.

Critique/analysis: According to the builder, the project exemplifies "low-tech, do-it-yourself construction at a low cost, using local financing. It demonstrates free enterprise."

The media most helpful in promoting the project are commercial and public radio, public TV, and newspapers.

Organization	Delta Construction
Address	Odessa, Texas 79760
Contact	Lloyd Willis
Telephone	n/a
Funded By	Private (contractor plus local savings and loan)
Cost	$138,000
Congressional District	XIX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	TX
Project Name	Model Energy Conscious School District

Organization	Alief Independent School District
Address	Box 68 Alief, TX 77411
Contact	R.C. Estes-Bldg. Prog. Jerry Till-con. rebates
Telephone	(713) 498-8110

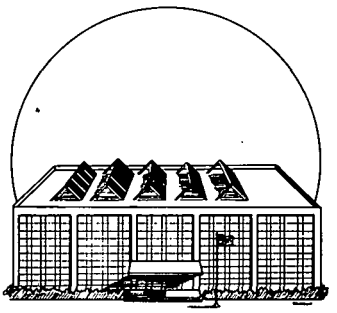
Funded By	*Internal*
Cost	n/a
Congressional District	VIII
Compilation Date	February 1980

The first Alief Independent School District solar project, an elementary school, is equipped with solar and wind energy devices. Well insulated, the building rarely needs additional heat. So the solar roof-top collectors, accompanying storage tanks, and heat pumps are used only 2-3 percent of the time for space heat. Even the solar hot water is little used, as a satellite kitchen serves the school. Nevertheless, at a cost of $2.8 million, this 84,000 square foot building launched the School District on a solar and conservation campaign.

New Alief School District buildings are routinely designed now with conservation measures such as earth berms to reduce exposed surfaces, 3" to 4" of styrofoam insulation on both the walls and roof, and 12" to 16" thick walls.

At the new school-bus station, hot water is in high demand for bus washing. Not only is the water solar heated, but the sloped roof collects rain water that is used to rinse the buses. Additional solar hot water is fed to the showers and sinks, while another loop feeds the hot water to coils buried in the floor slab to help heat the space. Each work station has individual valve control of its own solar-heated slab. Still another loop connects the solar water to air-heat pumps for air conditioning, putting heat into the water storage tank during the cooling cycle and taking heat out of the water-storage tank when space heat is needed. Outside lighting is provided through two 3-KW wind generators connected to batteries and an invertor that powers 12-watt fluorescent fixtures with parabolic reflectors (equivalent to 100 watt mercury vapor lights).

The schools' approach to interior lighting stresses quality, rather than just quantity. The use of "equivalent sphere illumination," which calculates what the eye actually sees, has helped improve quality while drastically decreasing



energy consumption. Wall colors, surfaces, windows, and skylights are carefully designed to contribute to the overall light quality. In addition, classrooms are equipped with individual light-level meters so that windows and lights can be adjusted throughout the day.

The entire school district has an energy rebate program whereby a percentage of all funds saved through energy conservation is automatically returned to the school activity fund--to be spent as the school wishes. Such rebates often total $3000 to $5000 for a single school each quarter.

One of the simplest strategies adopted by staff and students is to dress for the weather. Another tactic is to heat and cool spaces in relation to their use, rather than uniformly.

The district also has an active energy graphics program in the school,--slide shows on walls in hallways and foyers, for example. One school now planned will have an entire wall showing minute-by-minute energy consumption in the school, both in KWHs consumed and peak demand, including instruction on meter readings and prominent places to record monthly consumption and costs.

The School District is cutting costs even further by switching its schedule of energy use, since peak charges can be 40 to 50 percent higher than off-peak charges. For example, they produce ice at night and during the day circulate water past the ice to chill air for air conditioning.

In the construction/drawing phase are two energy-conscious buildings: a high school new middle school, which will have a microssor to control the KWH electrical demand charges.

Critique/analysis: Energy-efficent buildings don't have to cost more than conventional ones, particularly as the running costs are so much lower. However, Mr. Estes cautioned, the increased design costs from the architect can be substantial. He advised contracting with architects on a fixed-fee basis. He also cautioned that any engineering work must go hand-in-hand with architectural work from the outset.

Renewable Resources— A National Catalog of Model Projects

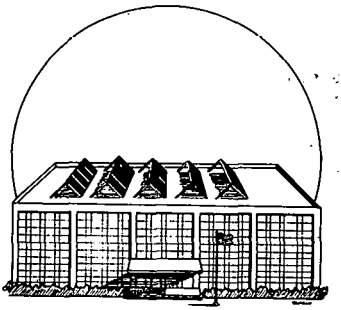
Category	Institutional
State	TX
Project Name	Reagan High School

Greg Erickson, a local solar designer and builder, chose an ideal site for a 1400 square foot attached solar greenhouse. Three of his students at Austin Community College and members of the Austin Women's Appropriate Technology Collective seized the project as an opportunity to acquire skills, experience, and knowledge in passive solar construction. Of equal importance was a commitment to collective work. They saw the greenhouse as an example of appropriate technology to the student population and as an invaluable educational tool.

The Reagan greenhouse features a carefully designed ventilation system, thermal chimneys to provide adjacent classrooms with solar-heated air during winters, and convertible shading/ insulation panels for maintaining a year-round growing environment. Recycled materials, including used bicycle inner tubes and scrap wood from construction sites, were utilized whenever possible. Total construction costs to date stand at about $1500, making the Reagan Greenhouse a fine example of cost-efficient construction. All labor has been donated, including that of high school students, who helped pour the foundation.

Plans are currently underway with both the high school and community college to make use of the greenhouse in exising courses and to develop an interdisciplinary program in appropriate technology.

Organization	Reagan High Scl
Address	Reagan High School Austin, Texas 78705
Contact	Gail Vittori
Telephone	(512) 478-8910
Funded By	Austin Community College, Reagan High Sch. & private sourc.
Cost	n/a
Congressional District	X
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

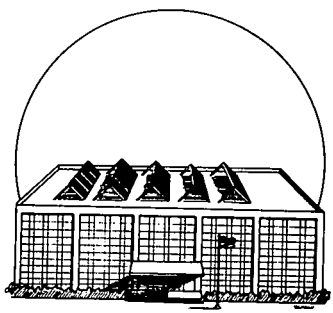
Category	Institutional
State	TX
Project Name	Twenty-First Street College House's Solar System
Organization	College Houses, Inc.
Address	1906 Pearl Street Austin, TX 78705
Contact	Bob Russell
Telephone	(512) 476-5678
Funded By	HUD
Cost	$150,000
Congressional District	X
Compilation Date	February 1980

College House's solar system, funded through HUD's Residential Solar Energy Demonstration Program, meets 40 percent of the annual heating, cooling, and domestic water heating needs for a student housing cooperative of a hundred members, housed in five buildings. The buildings were built in 1974 to house the cooperative, and plans were laid then to retrofit a solar system when suitable design and financing were found. In anticipation, an 88-ton gas-absorption chiller was installed in the complex because it is compatible with solar technology. Since roof space was limited and the chiller needs 200 degree water, the system designers chose locally-made concentrating, tracking collectors. An Austin-based solar research group ran a computer simulation program to aid the design process.

The system, completed in October of 1977, includes 228 collectors in fifteen banks, a 6000-gallon vertical storage tank insulated with three inches of urethane foam and an immersed copper pipe heat-exchanger for domestic hot water, a 100-gallon per minute pump for the solar water loop, valves, piping, and controls. This system was retrofitted to the chiller, a cooling tower, a 2.5 million-Btu boiler, three 199,000-Btu gas water heaters, and a four-pipe heating/cooling system. College Houses was its own builder, and contracted out the mechanical, plumbing, electrical, and insulation work.

College House's system is one of twenty- ıationwide that are instrumented so that HUD (ɔllect performance data. Forty-six sensors, ____ling two pyrano-meters, various flow-meters, thermometers, watt-meters, and gas meters monitor every part of the system, and sent data out to a computer for analysis. The resulting monthly performance reports provide HUD hard facts and a way of evaluating various solar system designs.

The system cost $135,000 to build, instrumentation an additional $15,000, and modifications approximately $7000.



Critique/analysis: College Houses' project, one of the first of its kind in the country, experienced problems which have taken several years to work out. The tracking mechanism has been redesigned and replaced twice; freeze protection was changed from a drain-down system to circulating stored-heat system; various control problems have been solved, and now a fully-computerized control system is being designed by a co-op member. The rigid swivel fittings have been replaced with flexible fittings to prevent binding of the collectors. (Most of these modifications have been designed and implemented by members of the co-operative, demonstrating that even complex solar systems can be modified and maintained by non-professionals.)

One final problem has developed. College Houses has a high volume contract with the local gas company (a lower rate but minimum consumption level of 300 MDF) because it uses gas for cooling as well as for heating and hot water, and usually consumes 300 MDF or more per month. But because the solar system has been working well, consumption has dropped well below 300 MCF during the six seasonal transition months, so College Houses must pay the minimum use rate, and the gas company refuses to modify their policy. This issue will be raised with the Texas Railroad Commission, which regulates gas rates in Texas. It is a point that must be won for large solar systems to become commonplace in Texas.

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	TX
Project Name	Energy Conservation Program

Funds from the Community Services Administration and the Department of Energy have been combined to support an emerging solar retrofit program for making 120 houses more energy efficient.

Through a single grant from the Texas Housing Development Corporation, one house has a site-built solar furnace attached consisting of 96 square feet of double-glazed air collector using water-filled discarded milk containers for storage. The system will be operational this winter. Unfortunately, however, THDC no longer supports these kinds of efforts.

In cooperation with the South Side Community Center, a few "breadbox" style solar water heaters have been built. The first, based on plans from Zomeworks in Albuquerque, works well. The latest design is based on using a discarded refrigerator for the shell.

Critique/analysis: The initial effort was very skimpy because of the need to learn and because of administrative uncertainty. Later efforts proved more thorough.

Organization	Community Action, Inc.
Address	P.O. Box 644 San Marcos, TX 78666
Contact	Art Millecam
Telephone	(512) 392-1161
Funded By	DOE Grant
Cost	$30,400
Congressional District	X
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	TX
Project Name	Solar Demonstration Project

Initiated in the fall of 1978, the Solar Demonstration Project in Brownsville is designed to prove the viability of low-cost solar energy applications in low-income Mexican-American communities.

The principal objective of the Brownsville Solar Demonstration Project is the installation of 73 passive, thermosiphon, solar hot water systems on the homes of primarily rural, low-income families residing around Brownsville.

Each home is also being weatherized, and 30 of the homes are being further retrofitted with attic-ventilation systems for space-cooling.

The solar systems are being supplied by an Austin manufacturer who is training four Brownsville contractors to install them. These contractors, in turn, have trained installation crews drawn from local CETA program participants.

According to Nicolas Ramon, project director, the advantages of this program funded through a $100,000 contract from the Texas Energy and Natural Resources Advisory Council, are many. It provides new skills and business opportunities for local small businesses; provides new training and jobs for underemployed local residents; provides low-cost water and space heating for low-income families while also introducing them and their neighbors to the wonders of solar energy. In addition, still wider community participation has been achieved through a series of informational meetings with area residents before and during the project.

Critique/analysis: Ramon says the project is "95 percent complete" and showing signs of genuine success. Utility bills on the solar-equipped homes have been reduced by 30 to 60 percent and hundreds of people in the target communities have become solar enthusiasts.

Organization	Community Development Corp. of Brownsville
Address	833 W. Price Road Brownsville, TX 78520
Contact	Nicolas Ramon, Jr.
Telephone	(512) 541-4955

Funded By	TX Energy & Natural Resources Advisory Council
Cost	$100,000
Congressional District	XV
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	TX
Project Name	Solar Heating Project

With the intention of assessing and promoting appropriate technologies for low-income families, the Texas Housing Development Corporation has become involved in three solar heating projects.

One project, funded by the Community Services Administration, is a six-month project for building low-cost solar water-heating systems for low-income homes. The Center for Maximum Potential Building Systems was the design and construction grantee, and the local community action agency was involved in screening, selecting homes, and providing the necessary labor for collector installation. This project provided job-training opportunities for CETA-funded employees of the City of Austin Weatherization Project, and promises to help lower utility bills. Four variations of the basic design will provide working examples of low-cost, environmentally sound, small-scale appropriate technology for this Austin community.

The THDC's Solar Hot Water Demonstration Project drastically reduced one family's energy bills, but the project's initial costs of $1500 proved to be beyond the means of low-income families without access to low-interest financing. CETA youth were employed for the installation.

The third project was the installation of a solar furnace (costing $1603 for materials) on the home of a low-income family residing in San Marcos, Texas. While this project utilized CETA-and Green Thumb-funded employees, and relied on local expertise and materials suppliers, no recycled materials were used. The Community Action Agency of Hayes, Caldwell, and Blanco Counties jointly designed and implemented the project.

The strength of these projects is that of a visible and operative alternative to conventional heating systems.

Organization	Texas Housing Development Corporation
Address	221 E. 9th St. Suite 203 Austin, TX 78701
Contact	John Moody
Telephone	(512) 476-7517
Funded By	Community Services Administration
Cost	n/a
Congressional District	X
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	TX
Project Name	Weatherization Project

The Weatherization Project of the Tri-County Community Action Agency, currently operating with $44,000 of federal grant money, prioritizes work according to need. With highest priority given to the elderly and handicapped, the main objective in its first phase is to stop air infiltration by making home-repairs and installing insulation.

Local labor is utilized through arrangement with CETA, which also provides training in the required skills. Participation of the homes' residents in the home-improvement effort is encouraged.

Radio and TV announcements, newspaper articles, and newsletters help advertise the availability of these services to the target populations.

Critique/analysis: Thus far, the Weatherization Project is estimated to be about 75 percent successful. It has demonstrably helped conserve energy and increase the comfort of those living in the weatherized homes.

Organization	Tri-County Community Action Agency Weatherization Project
Address	322 Shelbyville St. Center, Texas 75935
Contact	Jan Morris
Telephone	(713) 598-3298
Funded By	DOE
Cost	$44,000
Congressional District	I & II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	TX
Project Name	Weatherization and Recycling

Community Action Nacogdoches, Inc. is weatherizing the homes of the low-income elderly and handicapped homeowners in the area and helping to meet Nacoghoches' energy needs now. Concentrating on both rural and urban sectors, this CAA seeks citizen input on a regular basis in Policy Advisory Council meetings. Its recycling efforts are addressing the community's weatherization problems as well. Not only does it utilize lumber from condemned housing, but it also collects newspaper for use as cellulose insulation. Future plans include the sale of locally cut firewood.

With an overall budget of $51,000, funded by the Department of Energy, the organization earmarks $21,000 for use as labor wages, and over $27,000 for materials. Nacogdoches' weatherization project has provided valuable job-training and skills-sharing both through the CETA program and with individual residents.

Critique/analysis: This weatherization program has fostered an interest in appropriate technologies among the workers, and the project staff now plans to build passive solar systems for many of the weatherized homes.

Organization	Community Action Nacogdoches, Inc.
Address	Nacogdoches, Texas 75961
Contact	Shireen Vincent
Telephone	(713) 564-2491
Funded By	DOE
Cost	$51,000
Congressional District	II
Compilation Date	February 1980

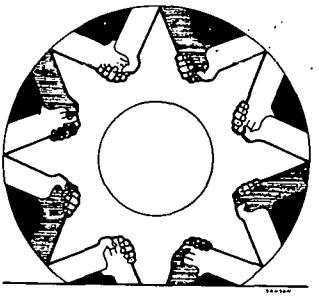
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	TX
Project Name	Austin Women's Appropriate Technology Collective
Organization	Austin Women's Appropriate Technology Collective
Address	613B Baylor Austin, Texas 78703
Contact	Gail Vittori
Telephone	(512) 478-8910
Funded By	n/a
Cost	n/a
Congressional District	X
Compilation Date	February 1980

The Austin Women's Appropriate Technology Collective grew out of a workshop held in May of 1978, to focus on the politics of alternative technologies. A primary aim of the collective is to participate with local communities and neighborhoods, sharing skills and information acquired through projects and readings. Skills-sharing is an ongoing process with the collective, which at times learns from and teaches men. The feminist approach to problem-solving and collective decision-making was an integral part of skills shared on a recent greenhouse project.

The Collective has focused on "hands on" passive projects such as a 1,400 square foot attached solar greenhouse at a local high school, a solar food dryer, group discussion of solar-related literature, and the production of local radio programs. Recycled materials were used as much as possible demonstrating low-cost technologies.

The Austin Women's Appropriate Technology Collective seems successful at infusing work with the values of appropriate technology. Its focus on women tackles head-on the special problems encountered by women historically excluded from the knowledge, design, development and control of technology.



Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	TX
Project Name	Center for Maximum Potential Building Systems

The Center for Maximum Potential Building Systems is an independent, non-profit, educational and research organization working on energy and resource conservation in Texas and the Southwest. Its thrust is toward promoting appropriate technologies that are small-scale, decentralized, low-cost, technically straight-forward, environmentally sound, labor-intensive, understandable, and manageable.

The Center works with solar and wind energy, waste recycling, biogas generation, water conservation, and indigenous earth-building materials. It serves clients through a staff that includes architects, planners, geologists, builders, artists, and others.

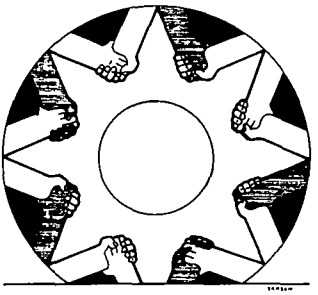
In Crystal City, a low-income minority community that has endured a 100 percent natural gas shut off since 1977, the Center helped supply 1000 mesquite-burning stoves. It also initiated demonstration, low-costs solar hot water heater and solar greenhouse programs coordinated with city-wide materials reclamation. All programs train CETA crews.

In Carrizo Springs, appropriate technology is introduced via the weatherization program, which provides greenhouses and solar collectors retrofitted into the gas hot water heater flue for heat recovery. In a roof-repair project, the new roof was placed over the old, creating louble-roof ventilation system, reducing mer temperatures by 20 percent.

The Center also provides training and "hands on" workshops on low-cost solar greenhouses, solar collectors, wood stoves, and earth materials. These programs had more than 100 participants during 1978-79. The Center also provides design assistance and information services.

Organization	Center for Maximum Potential Building Systems
Address	8604 F.M. 969 Austin, TX 78724
Contact	Daria Bolton Fisk Pliny Fish
Telephone	(512) 928-4786

Funded By	n/a
Cost	n/a
Congressional District	X
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Utility
State	TX
Project Name	A Study of the Solar/ Utility Interface in Texas
Organization	Texas Public Utility Commission
Address	7800 Shoal Creek Blvd. Austin, Texas 78757
Contact	Ms. Jeanne Schillaci
Telephone	(512) 458-0100
Funded By	Texas Energy & Natural Resources Advisory Council
Cost	$25,000
Congressional District	X
Compilation Date	February 1980

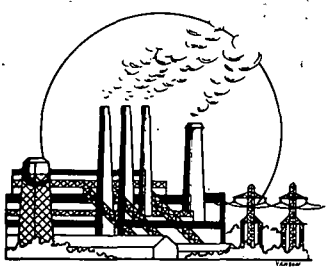
The Texas Public Utility Commission, like other utility regulatory agencies across the nation, is attempting to answer several questions through its two-year study of the "Solar/ Utility Interface."

What is the appropriate response of a Texas gas or electric utility to the growing use of solar and wind energy systems in its service area? How is a utility to deal with the fact that solar and wind installations reduce the volume of gas or electricity it sells annually, thereby reducing the utility's income? Should a utility be expected to encourage solar/wind installations by offering lower rates to customers who install such systems? Or should a utility be allowed to charge higher rates to solar-and wind-equipped customers on grounds that it must provide "back-up" energy when the sun isn't shining and the wind isn't blowing?

The PUC is also grappling with other issues: whether, and to what extent, the state's utilities ought to be involved in the marketing of solar and wind energy systems, and whether the utilities themselves should build and operate centralized solar and wind electric generating plants.

The main research tool besides documentary research is direct consultation with the utilities likely to be affected by the Commission's policies.

According to staffer, Jeanne Schillaci, the Commission hopes that its study might eventually lead to lower rates or a solar credit for solar customers.



Renewable Resources— A National Catalog of Model Projects

Category	Community
State	TX
Project Name	Colonias del Valle

The tip of Southern Texas is an unusually rich, fertile agricultural area that annually produces millions of dollars worth of citrus fruit, vegetables, and other cash crops.

This area, which is mostly controlled by large corporate farming interests, is thus also the winter homeland of Chicano migrant farm laborers. Dotting the countryside between booming urban centers and 1,000-acre farms, the villages of these Chicano farmworkers represent some of North America's impoverished communities.

Known in Spanish as "colonias," these rural barrios average around 50 families, and number about 70 throughout the valley. Of the small wood-framed houses that line the dirt roads of the typical colonia, about one-third have no hot water, many have no running water at all, and many do not have electricity. Reportedly, local government officials offer few services or programs because the farmworkers are considered to be living outside the jurisdiction of city or county authorities. Very few of the colonias have the right to vote.

One group that is seeking solutions to many of these problems is Colonias del Valle, an agency designed to channel state and federal money aimed at building some local self-sufficiency among the migrant colonias. For over ten years, Colonias del Valle has spearheaded projects for health care, housing, food, legal advocacy, voter registration, naturalization, job training and placement and economic development. It has recently added energy-related programs that are operating in three counties, reaching about 15 of the colonias. These programs include weatherization, passive space and water heating, housing rehabilitation, wind-generated electricity and food production.

Organization	Colonias del Valle
Address	P.O. Box 907 San Juan, TX 78589
Contact	Amancio Chapa Director
Telephone	(512) 787-9901
Funded By	Nat. Assn. of Farmworkers Organizations, CSA, Southwest Border Commission
Cost	$110,000
Congressional District	XV
Compilation Date	February 1980

The solar water-heater and greenhouse project have received by far the most attention. Ten crew positions and three crew leaders, all CETA employees, have so far installed 35 Fisk-type collectors, a design developed for Crystal City. The collector can be built and installed using recycled materials for around $85. Erected on south-sloping roofs, the collectors are jokingly referred to by residents as rockets or missles aimed at unknown targets to the north. The collectors are inexpensive and highly efficient, and the demand for them is too high for the team to meet. The waiting list is long, and priority is given to those houses without any hot water.

Simple, wood-framed greenhouses built by CETA crews are also popular. Residents of homes where greenhouses are to be attached are encouraged to participate in the construction and installation, and are instructed on how to properly maintain the greenhouse system. The same goes for the hot water collector recipients--once the system is installed, proper maintenance becomes the responsibility of the owner-resident.

Funding for the first 14 collectors came through a grant of $5,000 from the National Association of Farmworkers Organizations. The Community Services Administration has provided an additional $85,000 for other energy-related projects.

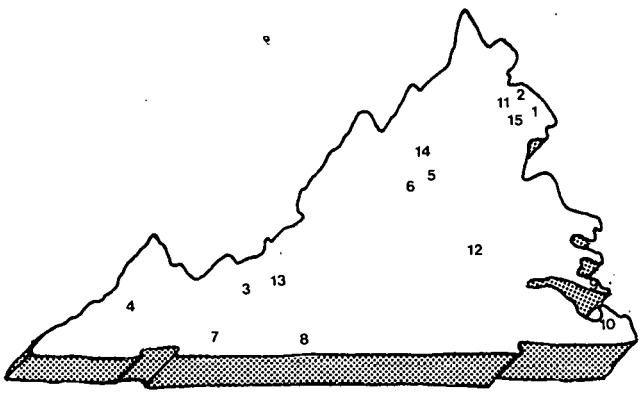
Colonias del Valle has also contracted with wind engineering maverick Bob Foote of Whitehawk Valley, Texas, to analyze the costs of wind-generated electricity. Foote has developed a no-nonsense electrical generating wind system that Colonias del Valle hopes will utilize another locally occurring renewable energy resource--the near constant gulf breeze.

Other Colonias del Valle projects include a cooperatively managed pig farm, and construction and material/financial support for high-yield home gardens. The group also has plans for construction of large tomato greenhouses.

Critique/analysis: The road to local self-sufficiency in energy, food and shelter will be long and hard for the migrant workers in South Texas. Organizers have little choice but to rely on important sources of funding, which they know are subject to the shifting political wind. Many political observers criticize this dependency on cash imports and the destabilizing influence it has on long-range program development. For the most part, Colonias del Valle promotes self-help programs and local economic development, using outside funding as seed money.

VIRGINIA

1. Alexandria
2. Arlington
3. Blacksburg
4. Castlewood
5. Charlottesville
6. Crozet
7. Galax
8. Halifax
9. Hampton
10. Norfolk
11. Reston
12. Richmond
13. Roanoke
14. Standardsville
15. Sunset Hills



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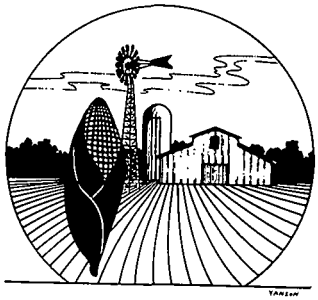
Category	Agricultural
State	VA
Project Name	Redden Windmills

Mr. Redden has two windmills under construction on his Virginia farm. One is used for the generation of electricity to supply 110 Volt current to his 3,000 ft^2 house. The cost was $10,000, including wiring, mill tower and storage.

The second wind-machine is used for pumping water for his farm and residence. Once construction is completed there will be a minimum of maintenance. The cost is estimated at $1,600-$7,000, depending on the depth of the well and the amount of storage capacity.

Organization	Louis Redden
Address	Star Route B Box 29 Standardsville, VA 22973
Contact	Louis Redden
Telephone	n/a
Funded By	n/a
Cost	$10,000 (Electric) $1,600-$7,000 (Water)
Congressional District	VII
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	VA
Project Name	Solar-heated Firewood Dryer

Organization	Virginia Cooperative Extension Service
Address	Virginia Polytechnic Institute & State Univ. (VPI & SU) Blacksburg, VA 24061
Contact	Eugene M. Wengert Extension Specialist
Telephone	(703) 961-5560

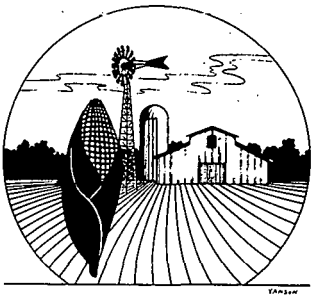
Funded By	DOE grant
Cost	$60 (owner-constructed)
Congressional District	State-wide
Compilation Date	February 1980

Eugene M. Wengert, extension specialist, has developed a passive solar firewood dryer that reportedly dries wood faster and more efficiently than the traditional air-drying method. While fully dried wood requires three summer months of drying (and contains 20 percent moisture), solar-dried wood is ready after six to eight weeks, and has only seven percent water content.

The lower moisture content reportedly boosts the wood's efficiency 5 by 13 percent.

Wengert designed the shed to receive sunlight through its south wall, constructed at a 45 degree slope and covered with plastic. Sunlight hits black plastic on the floor of the structure, which re-radiates heat into the surrounding air, and initiates a convection current that rises to the top of the dryer. As the hot air rises, it pulls air from the back of the dryer through the wood; the cooler air then heats, rises, and starts the cycle again.

Critique/analysis: The dryer was designed to minimize cost. Its efficiency can be improved by increasing the collector size and reducing dryer heat losses. The dryer can also be used as a cold frame for starting plants in the spring.



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
State	VA
Project Name	Solar Grain and Peanut Dryer

Organization	Agricultural Engineering Department
Address	Virginia Polytechnical Institute and State Univ. (VPI & SU) Blacksburg, VA 24061
Contact	Dr. A.J. Lambert, Dr. D.H. Vaughan
Telephone	(703) 961-6615

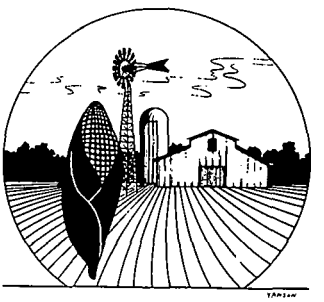
Funded By	Private (Owner)
Cost	$1.50 ft^2 (1977 dollars) Total system cost: $2,500
Congressional District	IV & IX
Compilation Date	February 1980

W.B. Robinson, Jr., a Greenville County farmer, needed an additional drying facility for peanuts and grain that could operate 75-90 days per year. The result was an integrated solar collector shed, built in September of 1977 using farm labor.

Use of standard materials and local customary building practices were considered necessary in the design of the collector. The pole-type peanut shed is similar to other peanut sheds, with the exception that translucent fiberglass laminate was substituted for metal on the south facing roof. (The original design specified standard stock translucent fiberglass corrugated panels but they were not delivered by construction time.) Below the rafters, exterior construction grade plywood sheets painted black completed the integrated collector.

A plenum chamber was installed on the south side of the building to serve as both solar collector and air collection space. The interior wall of the plenum was covered with plywood and painted black. A high volume, gas-burning crop dryer was installed in the facility as a back-up system. No heat storage was designed into the system.

From October to December, 187 tons of peanuts were dried at the facility, at an overall system efficiency of 45 percent. This represents a significant increase in drying efficiency over traditional peanut drying (which is less than 35 percent efficient). Annual savings are estimated at 1,176 gallons of LP gas, or $529 (1977 prices and dollars). The drying shed can be locally built for about $1.50 per sq. ft., or about $2,500 for the whole solar collector addition. At that rate, the payback period is 4.7 years. However, in light of recent fuel price increases, the payback period may be dramatically shortened in 1980.



Renewable Resources— A National Catalog of Model Projects

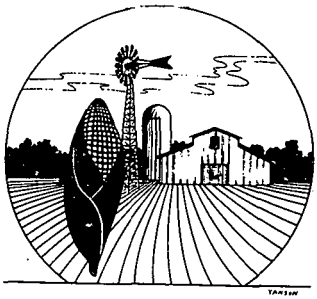
Category	Agricultural
State	VA
Project Name	Solar Livestock Housing Demonstration
Organization	Agricultural Engineering Department
Address	Virginia Polytechnical Institute and State Univ. (VPI & SU) Blacksburg, VA 24061
Contact	Dr. D. H. Vaughan, Dr. Hughes
Telephone	(703) 961-5897
Funded By	3 year DOE/USDA grant Farmers will pay 50% of costs of building and installing solar equipment.
Cost	$243,800 Total
Congressional District	IV, V, VII, IX
Compilation Date	February 1980

Virginia Polytechnical Institute is testing a variety of solar applications to heat livestock shelters throughout Virginia. Five dairy shelters (averaging 125 cows each), four swine houses, and one turkey shelter will be constructed or retrofitted.

The project highlight is a proposed passive milking parlor for 200 cows in Rockingham County. Flat plate collectors, solar-assisted heat pumps, and underground thermal storage ponds will be demonstrated on swine farrowing houses and poultry brooders. Two demonstrations will be built in each of the following locations: Appomattox Co., Rockingham Co., Shenandoah Co., Virginia Beach, and an undetermined southwest Virginia location.

Critique/analysis: The project must solve certain problems unique to the animals to be housed. For example, poultry brooding is energy intensive; chicks require high ambient temperature to survive the first weeks of life. However, direct hot air dehydrates their bodies, making them vulnerable to disease and death.

The results of these demonstrations will be of great value to farmers since a variety of solar applications are being tested in several geographic locations. While the initial investment for these solar systems will be greater than for conventional systems, operating costs are expected to be comparable.



Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	VA
Project Name	A. Smith Bowman Ethanol Plant

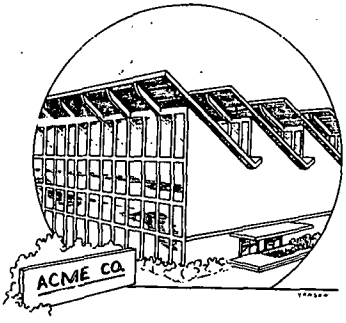
A. Smith Bowman Distillery, makers of Virginia Gentleman Bourbon and the state's only distillery, has begun work to retrofit part of the facility for the production of ethanol for gasohol.

Bowman expects the facility to be on line in April of 1980, and plans to market the ethanol for $1.70 per gallon.

According to Robert E. Lee IV, company vice president and descendant of the Confederate general, the decision was made to begin ethanol production because "you can't make good whiskey in the summertime," as the mash cannot be cooled properly.

Critique/analysis: Although it may be several years before ethanol production is profitable for the distillery, it will reduce seasonal slowdowns and provide diversification for the one-product firm.

Organization	A. Smith Bowman Distillery
Address	11710 Sunset Hills Road Sunset Hills, VA. 22090
Contact	Robert E. Lee IV
Telephone	(703) 471-4555
Funded By	Internal
Cost	$400,000
Congressional District	VIII
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Commercial
State	VA
Project Name	Solar Car Dealership

Organization	Lindsay Cadilla
Address	1200 Duke Street Alexandria, VA 22314
Contact	Mr. Reed, Manager
Telephone	(703) 998-6600

Lindsay Cadillac Co. has substituted solar energy for increasingly expensive fuel oil to supply heat and hot water to their new showroom/ garage.

Mounted on the roof of the 38,400 ft^2 building are 62-5'x12' collectors having a combined surface area of 3,310 sq. ft. They are positioned at a 30 degree angle and face southeast.

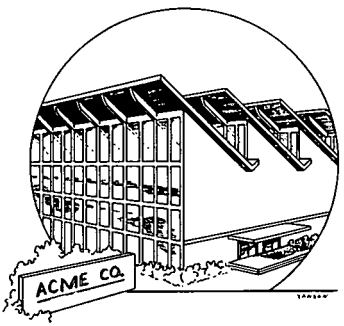
Water is pumped to the roof and conducted into the collectors through a series of small tubes. The concentration of solar radiation within the tubes heats the water, which is then pumped through two heat-exchange systems.

Funded By	Privately financed
Cost	$125,000-130,000 (Estimated)
Congressional District	VIII
Compilation Date	February 1980

Critique/analysis: The system is completely operational and is expected to supply 50 percent of the building's heating requirements, and 100 percent of its hot water needs. An oil-fired furnace supplies back-up heat.

The estimated payback period for the system is 20 years. This figure would decrease as the price of fuel oil rises.

The owner and installer are exploring the possibility of a third heat-exchange system to provide air conditioning in the summer.



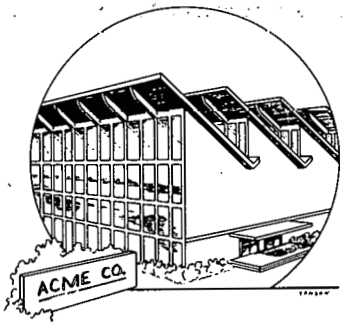
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	VA
Project Name	Solar Car Wash

The Yellow Cab Co. uses a 1,250 ft^2 active solar water heating system to provide hot water for its car washing facility. The solar heated water is stored in a 275 gallon tank which is insulated with polyurethane foam.

The business saves about $50 of fuel oil a week by using the solar water heater.

Organization	Yellow Cab Co. of Charlottesville
Address	Route 2, Box 540 Crozet, VA 22932
Contact	Jay Graves
Telephone	(703) 823-5339
Funded By	Private
Cost	$750
Congressional District	VII
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Commercial
State	VA
Project Name	Solar Recreation Facility
Organization	Arlington Racquetball/Handball Club
Address	1122 Kirkwood Arlington, VA 22201
Contact	Mr. T. L. Rust Rust Construction Co.
Telephone	(703) 836-6010
Funded By	75% DOE grant, 25% Private
Cost	$100,000
Congressional District	X
Compilation Date	February 1980

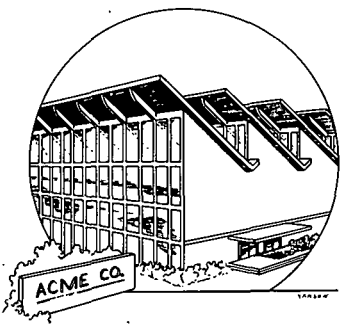
Previously dependent on a conventional all-electric system, the Arlington Racquetball/Handball Club has converted to solar energy for its heating and hot water needs.

The new system utilizes 120 roof-mounted collector plates and a 4,000 gallon water storage tank. The 2,520 ft^2 collecting surface is exposed to the sun's radiation. This energy is transferred to the water in the underground storage tank. The hot water is then pumped through coils, and transferred to the air by fans. The heated air is used to warm the lounge and locker rooms, (approximately 4,500 sq. ft.).

A similar heat exchange is used to satisfy the Club's considerable demands for hot water, which is primarily used in the shower and laundry facilities.

Critique/analysis: The Department of Energy's financial support will provide two benefits. First, it will reduce the payback period from twelve to four years. Secondly, DOE will be able to study the system over the next five years of operation, and compare the results with those of the conventional system used in the two previous years.

The solar system is expected to be completely operational by the 1980 heating season.

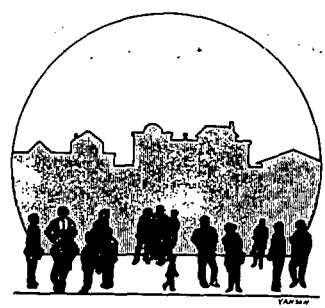


Renewable Resources—A National Catalog of Model Projects

Category	Community
State	VA
Project Name	Gasoline Conservation

The Diocese of Richmond rewards its employees with three minutes of vacation time for each employee trip using a carpool. Employees who carpool regularly can receive up to 3½ extra vacation days per year.

Organization	Catholic Diocese of Richmond
Address	807 Cathedral Place Richmond, VA 23220
Contact	n/a
Telephone	(703) 359-5661
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980

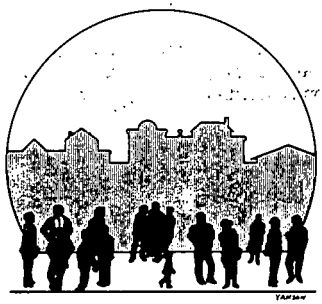


Renewable Resources—A National Catalog of Model Projects

Category	Community
State	VA
Project Name	Mt. Zion Baptist Church

When the Mt. Zion Baptist Church was erected in July of 1978, builders installed an active solar system that provides 45 percent of the 12,000 ft^2 structure's space heating and domestic hot water. The drain down system has 725 ft^2 of double-glazed collectors and a 9,600 gallon underground storage tank. The back-up system is an oil-heated water boiler.

Organization	Mt. Zion Bapt Church
Address	900 Middlesex Street Norfolk, VA 23523
Contact	Rev. Charles Hart, Joseph J. Wallace (Designer)
Telephone	(804) 454-3132
Funded By	Congregation
Cost	Total cost: $55/$ft^2$
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	VA
Project Name	Rural Recycling Demonstration

Organization	Rooftop of Virginia CAP, Inc.
Address	P.O. Box 853 Galax, VA 24333
Contact	Mrs. Bolton
Telephone	(703) 236-2751

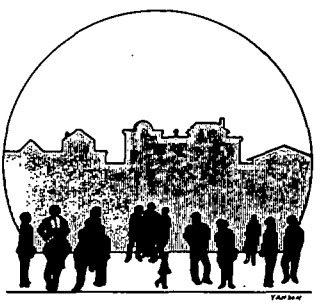
Funded By	National Center for Appropriate Technology
Cost	$4,721
Congressional District	IX
Compilation Date	February 1980

In July of 1979, the Rooftop of Virginia Community Action Program, Inc. initiated its rural recycling program. If residents will recycle 25 percent of the aluminum that enters the county each year, a yearly gross of $17,000 is expected.

Collection points are located at four major shopping centers throughout Carroll County. Approximately 1,600 pounds of aluminum is collected per week.

Profits from the recycling effort are put back into the project to pay the driver's salary and other transportation expenses.

ɔrmation concerning this project was made available to the Center by the National Center for Appropriate Technology.)



Renewable Resources—A National Catalog of Model Projects

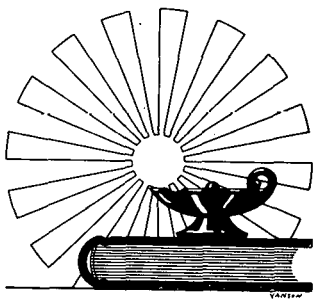
Category	Education
State	VA
Project Name	Geothermal Exploration

Exploratory shallow drilling (1000 ft.) is being conducted along the entire eastern seaboard to locate high temperature water reserves that may be used for a number of functions. Some suggested uses are residential space and water heating, industrial steam generation, and pre-heating of water and air for industrial food processing.

Geothermal water has been found in many places by drilling granite bodies which lie under layers of coastal sediment. While the VPI Geothermal Program searches for geothermal activity, a Johns Hopkins University team is developing several options for practical application of the resource.

The VPI team has drilled in VA in the following locations: Piedmont-Sussex Co., Cumberland Co., Goochland Co., Oceana, Norfolk, Suffolk, Isle of Wight, Hampton, Cheriton, and Wallop Island. VPI has also drilled in Wattsville, Withams, Tasley, Eastville, and Smith Island.

Organization	Virginia Polytechnical Institute and State University (VPI & SU)
Address	Geothermal Program VPI & SU Blacksburg, VA 24061
Contact	Dr. John K. Costain, Dr. Lynn Glover, III, Dr. A. Krishna Sinha
Telephone	(703) 961-5096
Funded By	DOE grant
Cost	n/a
Congressional District	IX
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	VA
Project Name	Trans Science II

Trans Science II is a mobile solar energy educational unit created and maintained by the Science Museum of Virginia.

Five active, hands-on exhibit/learning stations, supplemented by several models and cut-away displays, are featured in the 50'x10' unit. Most of the new equipment is designed for visitor interaction in demonstrating the principles, potential, and limitations of solar energy.

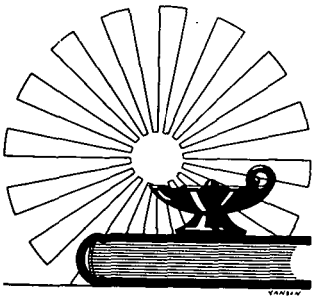
The learning stations include a photovoltaic cell demonstration, a solar air and water collector, and a solar Pachinko machine which demonstrates the interaction between the Earth's atmosphere and sunlight.

Trans Science II is available for display at conferences, county fairs, and other community events. There is no fee charged for using the mobile unit, but the Science Museum asks for a guaranteed minimum attendance of fifty persons.

During the winter months, Trans Science II remains parked on the Museum lot in Richmond where the public may view it. From spring to autumn, it travels to every part of the state. In the two years of its existence, about 250,000 people have visited Trans Science II.

Organization	Science Museum of VA
Address	2500 West Broad St. Richmond, VA 23220
Contact	Charles D. Smith
Telephone	(804) 257-1013

Funded By	United Virginia Bank Science Museum of Va., foundations, et al.
Cost	$50,000 (for renovation)
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Financing
State	VA
Project Name	Energy Conservation & Rehabilitation Loans

The Energy Conservation and Rehabilitation Loan Program provides reduced-interest loans to low- and moderate-income homeowners for energy-related home improvements.

Loans range between $1,000 and $15,000, and are made at eight percent interest with a pay-back of up to 15 years. (In addition, there is an annual FHA insurance charge of .5 percent of the loan amount.)

Loans are secured through a mortgage of the property to be improved.

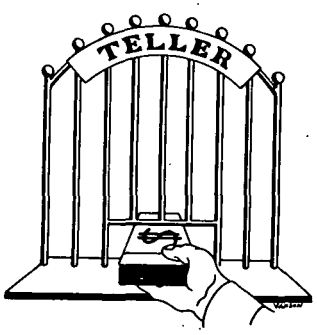
Rehabilitation loans include home repairs or alterations that reduce energy consumption. To be considered of low or moderate income, a family's total adjusted income cannot exceed $16,000 in certain high-cost areas, or $14,000 in other areas.

Mobile homes are not eligible under the program.

Energy Conservation and Rehabilitation Loans are made through 6 local lending institutions now participating in the program.

Organization	Virginia Housing Development Authority
Address	13 South 13th Street, Richmond, VA 23219
Contact	Anne Clayton
Telephone	(804) 782-1986

Funded By	Sale of Bonds
Cost	$5 million loan pool
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	VA
Project Name	"Monticello", Home of Thomas Jefferson

Organization	Thomas Jefferson Foundation
Address	P.O. Box 316 Charlottesville, VA 22902
Contact	James A. Bear, Jr.
Telephone	(804) 293-2158

Funded By	Personal Income
Cost	Sold for $7,000 after death of owner.
Congressional District	VII
Compilation Date	February 1980

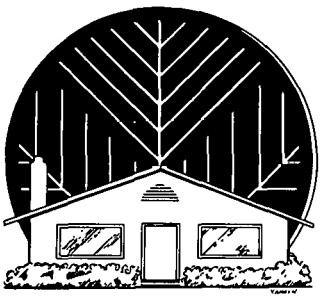
This owner-built, self-sufficient house was designed by a man who was a farmer and naturalist, architect, lawyer, philosopher, writer, scientist, mathematician, inventor, and President of the United States -- Thomas Jefferson.

Jefferson believed that "dependence begets subservience," and that the American character draws its strength from the obligation "to invent and execute, to find means within ourselves and not to lean on others." Jefferson's innovativeness is clearly visible in his approach to heating and cooling.

He installed rudimentary but effective storm windows -- a very unusual practice at that time. On the colder north side of the house the windows were triple-glazed. He devised storm shutters that could be opened and closed from the inside of the house. He put "nogging," a mixture of clay and brick fragments, in a cavity he built under the main floor to provide fire protection and keep heat from escaping through the floorboards into the cold basement.

The house was originally heated with fireplaces, one in each room. Later, Jefferson switched to wood stoves after his close friend Ben Franklin (inventor of the "Franklin stove") showed they produce twice the heat with half the amount of wood. Jefferson treated the wood on his property as a renewable resource: he took care t)lant as many trees as were cut down for f)od.

On the southern end of the house, Jefferson built a glassed-in Piazza that he and his family called the "Greenhouse." He grew seedlings for a time in the Greenhouse, but its main use was as a solar-heated room adjoining Jefferson's "Book-Room" or library, for use in the cool days of early spring and late fall. The Greenhouse was



fitted with Venetian blinds to prevent overheating in the summer. Jefferson also included unusual architectural features--a skylight--in his personal bedroom.

Jefferson designed Monticello for what we now call "passive cooling." The massive brick construction reduced heat gain over long Virginia summer days, delaying transmission of that heat to the building's interior until early evening or night. He was the first Virginia plantation owner to build on a breezy hilltop instead of near a river's edge, and his windows and floor plan were designed for maximum ventilation. Some architects suspect that his narrow, skylit interior stairways served as sophisticated "thermal chimneys," inducing air circulation in the house and cooling the upper floors.

Jefferson was not deliberately designing "passive solar" architecture. He simply liked the sunlight and warmth.

Critique/analysis: Kevin Green, one of today's pioneers in passive cooling, visited Monticello and came away impressed. What is remarkable," Green says, "is not that Jefferson's cooling strategies worked, but the fact that they stand up so well today... an architect commissioned for a villa on the same site today would do well to equal Monticello's passive cooling performance."

Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	VA
Project Name	NASA Tech House

Organization	NASA Langley Reserach Center
Address	Hampton, VA 23665
Contact	Technology Utilization Office
Telephone	(804) 827-3281

Funded By	NASA
Cost	n/a
Congressional District	I
Compilation Date	February 1980

The NASA Technology Utilization House (Tech House) was designed and constructed at NASA's Langley Research Center to demonstrate the application of new aerospace technologies to the homebuilding industry.

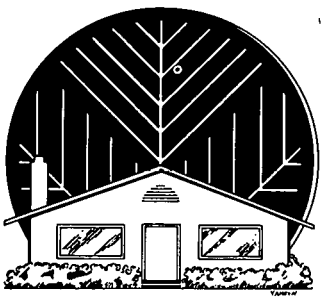
Mounted on the south-facing roof of this single level structure are 18 3'x 8' solar collectors which supply about 75 percent of Tech House's annual heating requirements. Water heated in the collectors passes through a heat exchanger which transfers the heat to ducts that distribute the warm air throughout the house. Storage is provided by a 1900 gallon underground thermal storage tank.

The Tech House fireplace is an integral part of the heating system. The fireplace grate is a coil through which water is circulated. The water is heated and delivered to the air duct heat exchanger to help heat the house.

Two of the 18 solar collectors provide hot water which is circulated into a preheat tank coil to heat incoming water to about 140 degrees F. A conventional electric water heater is used as a back-up. Estimates place the decrease in electricity usage for water heating at 75 percent.

Night radiators, which are mounted on the garage roof, work in conjunction with the heating system to provide cooling. The radiators raise t ıter temperature during the day and] it at night when cooling is necessary.

The heating and cooling loads of the NASA Tech House are reduced by the use of Urea tir-polymer foam, a nonpetroleum insulation; exterior retractable shutters; entry vestibules which act as airlocks, reducing the loss of cool or warm air; double paned windows with a low-conductivity plastic material separating the framing that holds the panes; and a large window area on the house's south side, which has an overhang to provide shading during the summer.

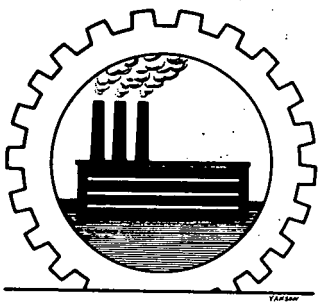


Renewable Resources— A National Catalog of Model Projects

Category	Industrial
State	VA
Project Name	Solar Asphalt Heater

Nine 4'x7' flat-plate collectors provide about 60 percent of the energy required to operate a 10,000 gallon asphalt plant. It was retrofitted in January of 1977.

Organization	VA Department of Highways and Transportation
Address	Volens Area Headqtrs. Route 645 Halifax, VA 24558
Contact	State Employees
Telephone	(804) 528-6590
Funded By	Department of Transportation
Cost	$16,000
Congressional District	V
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	VA
Project Name	Roanoke Valley Science Museum

Organization	Roanoke Valley Science Museum
Address	2323 Overlook Rd., N.E. Roanoke, VA 24012
Contact	Dr. Thomas Krakauer, Executive Director
Telephone	(703) 563-1891

The Roanoke Valley Science Museum has installed a solar hot water system on it's exhibit building to provide hot water for Museum use, and to demonstrate the practicality of solar water heating.

The solar heating system was installed on the roof of an existing wooden structure. Water is heated in four 18" x 7' copper collectors. It is then transferred to an 80-gallon storage tank. The system now provides enough heat to manage all of the museum's modest hot water needs without back-up from electricity or other sources.

Since it began operation, the highest water temperature recorded in the system was 144 degrees F.

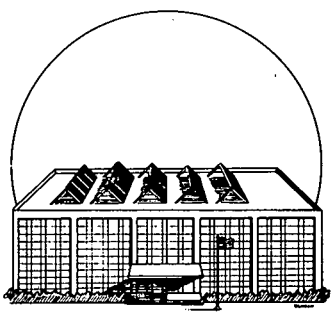
The system's control box and tank were provided by the manufacturer. Other materials, labor and cash were donated by local businesses and citizens.

The controls, tank and temperature sensor displays are on public exhibition in the Museum's Energy Room.

Plans are underway to install a pyroheliometer (a device that measures the sun's heat in BTUs) on the roof of the museum. Over time, the temperatures recorded from the pyroheliometer will be used as a data base to provide valuable information on solar heating potentials in that geographical area.

Prior to the installation of their solar water heating system, the Museum had no hot water, so comparisons of performance and costs cannot be calculated at present.

Funded By	Contributions
Cost	$1,900 retail
Congressional District	VI
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	VA
Project Name	Terraset School
Organization	Terraset Foundation
Address	11411 Ridge Heights Road, Reston, VA 22091
Contact	James A. McCulley
Telephone	(703) 860-5208
Funded By	Fairfax County School Board; Dir'iyyah Inst., and a Saudi Arabian University
Cost	$2 million (Bldg.) $625,000 (Collector System)
Congressional District	VIII
Compilation Date	February 1980

Terraset is an earth-sheltered, solar-heated and cooled elementary school located in Reston, Virginia. It was built in 1975, in the aftermath of the first Arab oil embargo, as an integrated approach to energy conservation and educational design.

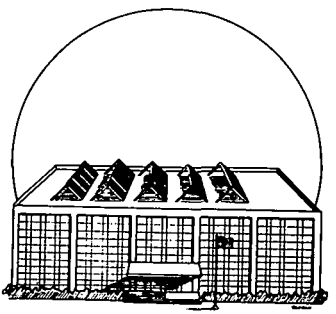
Terraset is aptly described as a hill with a school inside it. The building comprises a concrete shell covered by a water-tight membrane, four inches of gravel, and 12 inches of soil. This thermal buffer reduces the energy needed to heat or cool the buildings. The earth is so insulative that heat generated from people, lights, and machinery is reportedly enough to keep the school warm during winter months.

More than 4,800 ft^2 of evacuated tubing comprise Terraset's spherical solar collector system, which is capable of generating enough energy to heat ten homes. The hot water provides energy for the school's baseboards, an absorption chiller unit, and the domestic water heater. Excess hot water is stored in one of three 10,000-gallon dual temperature tanks. These tanks are also used to store cool water generated by the system in the summer months.

The entire plumbing, heat reclamation, and collector complex is controlled by a compact microprocessor computer.

Despite the fact that Terraset is an underground structure, the school is not dark or clammy. The classroom area consists of four large circular learning centers that can be subdivided with moveable partitions. As a function of energy conservation, the school's Open Classroom concept eliminates hallways and reduces the area needed to serve the student population.

The learning centers each have a large outside window that allows winter insolation but which blocks out summer sun. A large skylight



provides sunlight to the media center. From any one point in the building it is possible to see as many as three outside windows.

Terraset's direct monetary saving from October of 1978 through July of 1979 was $31,626, representing an energy savings of over one million kilowatt hours.

Fairfax County built Terraset at a cost of $2 million; however, the original plan included only the earth-shelter design. Ironically, funds for the solar system were provided by a grant of $625,000 from the Dir'iyyah Institute and a Saudi Arabian university.

In only a few years Terraset became such an overwhelming success and received such state- and nation-wide acclaim, that Fairfax County decided to completely underwrite the construction of a second Terraset at a cost of $5 million. The new school will be called Terracenter, and is located in Burke, VA. It will be completed in May of 1980.

The Terraset Foundation, a non-profit educational organization, was established to monitor the school's performance and to educate the public to the significance of the school.

tique/analysis: Terraset stands as one of the ghtest hopes in the nation's renewable ...rgy future for a few simple reasons. First, it works. Second, Terraset is a fine example of how the energy crisis can be solved by a local government using primarily its own money to build schools that reduce the use of non-renewable resources. It is hoped that Terraset and Terracenter will serve as an example to other county and city governments of what they can do to reduce the strain on their energy budgets through the use of renewable energy resources and innovative building design.

Renewable Resources— A National Catalog of Model Projects

Category	Legislation
State	VA
Project Name	Solar Tax Exemption

Organization	State of Virginia
Address	VA Office of Housing 6 N. Sixth Street Suite 202 Richmond, VA 23219
Contact	VA Office of Housing
Telephone	(804) 771-2981

Funded By	State Government
Cost	n/a
Congressional District	III
Compilation Date	February 1980

The Virginia General Assembly approved legislation defining solar equipment facilities or devices to be a class of property separate from real or personal property. This section further permits any county, city or town to exempt or partially exempt such property from local taxation.

Applications for exemption must be filed to the local building department on forms provided by the Office of Housing. Specifications must be included, and the system must conform with the Virginia Uniform Statewide Building Code.

If the unit qualifies, the application is forwarded to the Office of Housing which certifies the facility to the local assessment officer.

Upon certification, the local assessment officer shall estimate the value of the equipment. The tax exemption is determined by applying the local tax rate to the value of the equipment and subtracting such amount from the total property tax due on the housing.

Article 2 defines solar energy equipment for purposes of providing guidelines to determine eligibility for tax exemption. Active solar space and water heating systems are described. Photovoltaic cells are not described, but do qualify.

Article 3 defines qualifying passive systems. South facing windows, Trombe walls, greenhouses, thermal storage, moveable insulation and shading devices are included.

Critique/analysis: The scope of qualifying equipment and devices is quite expansive. However, thus far only Albemarle and Fairfax counties, and the cities of Alexandria, Falls Church and Lexington have passed tax exemption legislation.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	VA
Project Name	Coalition of Appalachian Energy Consumers

Organization	Coalition of Appalachian Energy Consumers
Address	Box 275 Castlewood, VA 24224
Contact	n/a
Telephone	(703) 765-5408

Funded By	Donations and Fundraisers
Cost	n/a
Congressional District	IX
Compilation Date	February 1980

The Coalition of Appalachian Energy Consumers consists of 28 member groups in six states that share a goal of organizing consumers of the American Electric Power System. Reportedly the largest investor-owned utility in the world, AEPS supplies power to the western portion of Virginia.

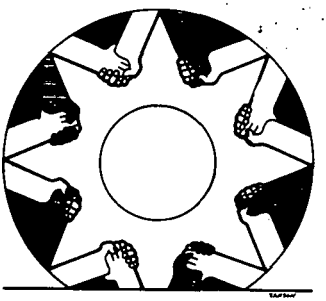
The coalition was created in 1979. Its membership includes Sierra Club chapters, senior citizen groups, and anti-nuclear groups.

Among the Coalition's activities has been the opposition of proposed pump facilities at Brumley Gap and Stoney Creek, the latter in Wise and Scott counties. The group is also investigating plans of the Appalachian Power Company (APCO) to connect its network of high voltage transmission lines with those of Tennessee Valley Authority nuclear facilities.

The Coalition is also working for utility rate reform. The Appalachian Rate Reform Research Project (ARRRP) is being conducted by a corporation of Coalition members and citizen groups in West Virginia. The corporation will investigate APCO's cost and growth estimates as compared to those that could be achieved by use of alternative technologies and energy conservation.

Critique/analysis: This is reportedly one of the best-organized and most successful national groups.

Funding, however, continues to be a problem. The Coalition is supported primarily through church grants, while local groups rely on personal donations, auctions and bake sales to finance their activities.



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	VA
Project Name	Home Energy Analysis

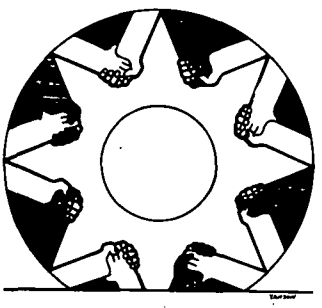
A home energy computer analysis is now offered to help Virginia residents determine home heating and cooling costs. The service also offers energy-saving advice to residents.

Homeowners complete a four-page questionnaire in which they detail the dimensions, insulation content and other important energy-related characteristics of their home.

In return, participants receive a list of recommended energy conservation measures for their particular home, along with an 80-page brochure on weatherization ideas.

Critique/analysis: About 10,000 families have made use of the computer analysis.

Organization	The Cooperative Ext. Service
Address	Energy-HACC University City Bldg. Room 267 VPI & State University Blacksburg, VA 23235
Contact	n/a
Telephone	(800) 552-3831 (energy hotline)
Funded By	n/a
Cost	n/a
Congressional District	III,
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

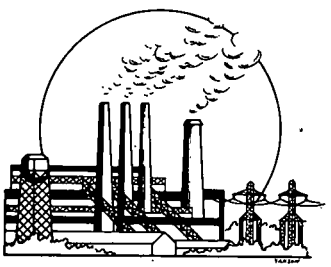
Category	Utility
State	VA
Project Name	VEPCO Solar Office Building

Virginia Electric and Power Co. (VEPCO) has installed 740 sq. ft. of solar collectors to heat and cool one of its new all-electric office buildings in east Richmond. Designed to conserve energy, the building is also equipped with a heat-pump and a waste heat reclamation unit. About 30 percent of the building's total energy requirements are met by solar. The back-up system, conventionally generated electricity, is usually used during off-peak hours.

VEPCO will monitor the building for energy performance comparing it with conventionally heated and cooled buildings in Springfield and Chesapeake.

Organization	Virginia Electric and Power Company (VEPCO)
Address	T & D Engineering Dept. Box 26666 Richmond, VA 23261
Contact	Mr. G. R. Robertson
Telephone	(804) 771-3606

Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



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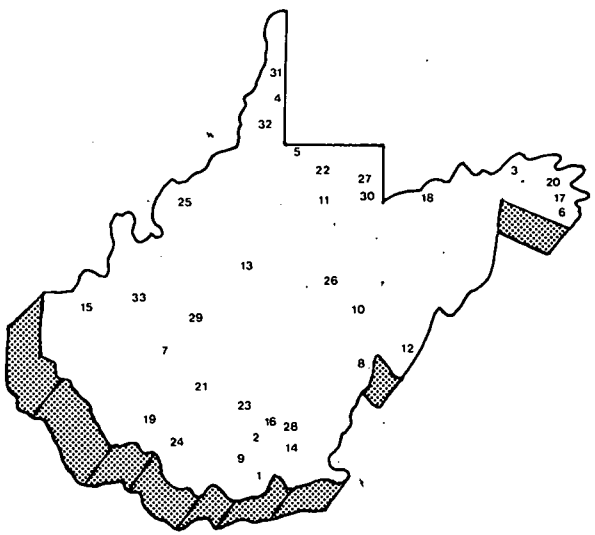
1. Athens
2. Beckley
3. Berkeley Springs
4. Bethany
5. Blacksville
6. Charles Town
7. Charleston
8. Cherry Grove
9. Crab Orchard
10. Elkins
11. Fairmont
12. Franklin
13. Glenville
14. Hinton
15. Huntington
16. Indian Mills
17. Kearneysville
18. Keyser
19. Logan
20. Martinsburg
21. Montgomery
22. Morgantown
23. Oak Hill
24. Omar
25. Parkersburg
26. Phillippi
27. Reedsville
28. Sandstone
29. Spencer
30. Terra Alta
31. Weirton
32. Wheeling
33. Winfield



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Category Agricultural

State WV

Project Name Food Dryer

The sun shines on Robin Sun. One of the appropriate technology activities this native of Spencer, West Virginia, is involved in is using a solar food dryer. The dryer is unique because it reuses the dehumidified air.

Sun is also working with the Appalachian Regional Office of the International Tree Crop Institute to develop food-drying techniques that are less energy-consuming than those dependent on chemicals.

Organization n/a

Address Route 3, Box 171A
Spencer, WV 25276

Contact Robin Sun

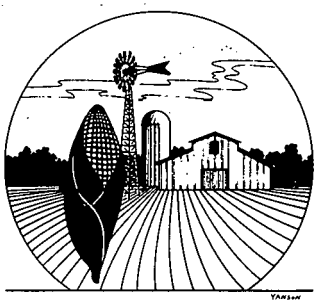
Telephone n/a

Funded By n/a

Cost n/a

Congressional District III

Compilation Date February 1980



Renewable Resources—A National Catalog of Model Projects

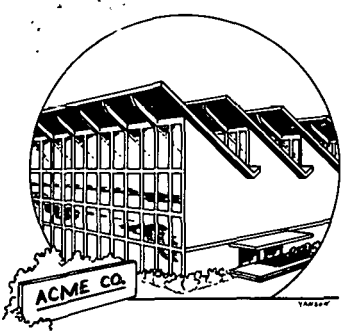
Category	Commercial
State	WV
Project Name	Alternate Energy Home and Store

The Sunwood Alternate Energy Store was started in 1977 to promote fuel savings through the sale of alternate energy equipment such as wood stoves and solar equipment. The store itself is heated with wood.

The Lowmans also built their own log home in 1978 to provide an economical place to live. Using wood heat and a solar domestic hot water heater, their home utilities cost $30 per month. The wood stove paid for itself the first year, and a three- to five-year payback period is expected for the solar hot water heater.

Many hours of time, effort, and personal perseverance made the Lowmans' store and home a reality. They feel that anyone with the time and will can do what they have done, since these are the primary limiting factors.

Organization	Sunwood Alternate Energy Store
Address	807 E. Moler Ave. Martinsburg, WV 25401
Contact	Rick & Kathy Lowman
Telephone	(304) 263-2129
Funded By	Private
Cost	n/a
Congressional District	II
Compilation Date	February 1980



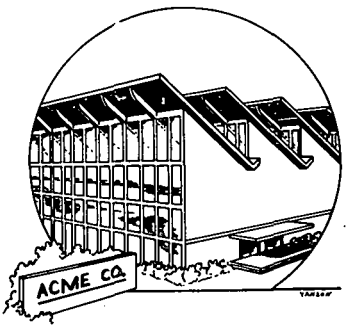
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	WV
Project Name	St. Patrick's Circle

A 32-unit townhouse community near Charleston was built with energy conservation in mind. The community, known as St. Patrick's Circle, has solar-assisted hot water heaters and features walls, ceilings, and windows that are well-insulated. The solar-assist and insulation combine to produce energy savings of up to $20 per month per townhouse units.

Critique/analysis: Although the payback period is relatively short (eight years), the builder has noted that people appear reluctant to spend the extra money for the energy-efficient townhouses.

Organization	Winfield Builders, Inc.
Address	5001 Route 34 Winfield, WV 25213
Contact	Elmer E. Shaw
Telephone	(304) 757-6520
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



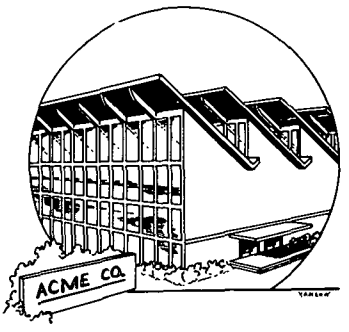
Renewable Resources—A National Catalog of Model Projects

Category	Commercial
State	WV
Project Name	Solar Age Press

Solar Age Press was founded in 1973 in New Orleans, and moved to West Virginia in the spring of 1974. The Press publishes low-budget, non-commercial literature on energy uses.

The Solar Age Press advocates energy conservation and renewable energy in its literature. In particular, it promotes the use of alcohol fuels, methane, fuel-efficient and lighter-weight automobiles, and natural fibers in place of petroleum-derived synthetics.

Organization	Solar Age Press
Address	Indian Mills WV 24949
Contact	Jack Frazier
Telephone	none
Funded By	n/a
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Community
State	WV
Project Name	Handmade Window Quilt
Organization	Sandstone Senior Ctr.
Address	Sandstone, WV 25985
Contact	Peggy Rossi
Telephone	(304) 466-4019
Funded By	Personal Capital
Cost	$25 (wood frame and quilt)
Congressional District	II
Compilation Date	February 1980

The window quilt project of the Sandstone Senior Center was intended to combine the energy-efficiency of the commercially produced window quilt with the traditional artistic beauty of hand-pieced quilts. Five members of the Center worked on the quilt, which has attracted much attention on display at fairs.

The five-layered window quilt features a top layer and backing made of cotton and polyester blends, a filling of beachwood, polyfill interlining, and an inner core of all-weather sportsman's blanket, which is waterproof and 80 percent heat reflective. Other materials are being tested for possible use in the quilt's inner core.

The window quilt can be used as a window shutter at night to prevent heat loss, replacing draperies or curtains. It is also machine washable. When sealed to a window on all sides by the wooden quilt frame, the device more than doubles the R-value of a double glazed window.

Although the quilts have not been marketed, they compare favorably to the commercially produced window quilt.

Renewable Resources— A National Catalog of Model Projects

Category	Community
State	WV
Project Name	Low-cost, Energy Efficient Housing

Family Homes Cooperatives, a non-profit corporation based in Raleigh County, West Virginia, is developing innovative solutions to the housing needs of low- and moderate-income people. It is attempting to overcome obstacles to using innovations that reduce housing costs and home energy consumption.

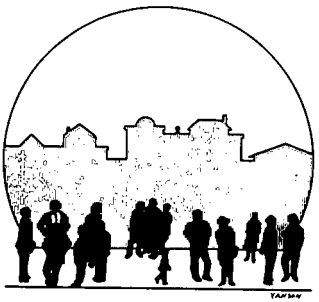
A primary effort was to complete a prototype house which is low-cost and energy efficient. The well-insulated house features passive solar and wood heating. It also utilizes structural innovations developed by Homer Hurst of Virginia Polytechnic Institute and State University. The design stressed maximum service and durability at minimum cost. Materials cost for the four-bedroom house was $8,500.

The inhabitants of the home reported that even on the coldest nights last winter (1978/79) they turned the wood stove down and didn't have to use blankets.

Since 1978, the Coop has pursued Farmers Home Administration approval of the prototype house. Written approvals have just recently been issued by both FmHA and HUD. This means that the Coop can now build significant numbers of these homes for low- and moderate-income families, who will be able to purchase the homes with low-interest loans.

Family Homes has explored numerous avenues for funding. The Southern Cooperative Development Fund indicated strong interest in providing loan funds at a 10 percent interest rate. Other interest has been expressed by the Appalachian Regional Commission and the National Rural Finance and Development Corporation.

Organization	Family Homes Cooperative
Address	Box 1017 Crab Orchard, WV 25827
Contact	Joseph Caldarola, Proj. Director; Jeff Monroe, Chairperson, Bd. of Dir.
Telephone	(304) 253-2133
Funded By	Numerous
Cost	$8,500 (prototype house materials); $150/mo (office costs)
Congressional District	IV
Compilation Date	February 1980



The Coop has designed eight additional houses of various sizes, all using the cost-saving structural and passive solar systems used in the prototype. It is nearing start-up of a factory that will supply complete cut materials kits for these houses to builders, individuals, nonprofit HDCs, and self-help groups throughout the six-state region. Cost for the complete kits, including plumbing, electrical, and foundation materials, will range from $6,000 to $16,000.

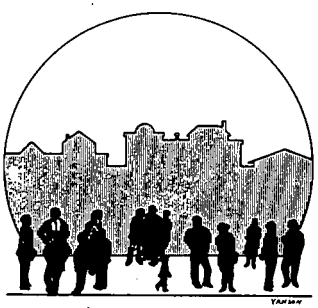
The production system will be operated as a coop with both worker and community ownership and control.

Renewable Resources—A National Catalog of Model Projects

Category	Community
State	WV
Project Name	Recycling Project

The Wheeling Area Training Center for the Handicapped recycles aluminum and cardboard. The desire to conserve energy and generate revenue, along with the utter necessity of recycling in the community, were the moving forces behind the project, which began in April of 1979.

Organization	Wheeling Area Training Center for the Handicapped
Address	109 N. Main St. Wheeling, WV 26003
Contact	Thois Blatnik
Telephone	(304) 233-6300
Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

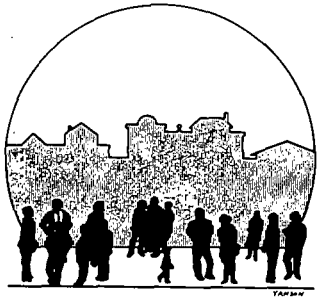
Category	Community
State	WV
Project Name	Senior Citizens Aluminum Recycling Task Committee

A committee member of the Hinton Senior Citizens' Center began the aluminum recycling project because it supplies income for Center activities, conserves energy, helps clean the environment, and provides a way for young people to earn money. The Senior Center has purchased more than $200 worth of needed equipment with funds from the recycling program.

Charles Rushford, the aforementioned committee member, is also responsible for Hinton's uniquely constructed recycling bins, which are placed along the street and cannot be mistaken for trash cans.

Rushford notes that recycling aluminum saves 95 percent of the energy that would be required to produce aluminum from bauxite. He feels that any community can undertake a similar recycling project because very little capital is needed.

Organization	Summers County Council on Aging
Address	25 Union Street Hinton, WV 25951
Contact	Charles Rushford
Telephone	(304) 466-4019
Funded By	n/a
Cost	n/a
Congressional District	II
Compilation Date	February 1980



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Category	Community
State	WV
Project Name	Solar Energy Planning Study

Organization	North Central West Virginia Community Action Assoc. (CAA)
Address	208 Adams St. Fairmont, WV 26554
Contact	Kenneth Dean, Dir.
Telephone	(304) 363-2170

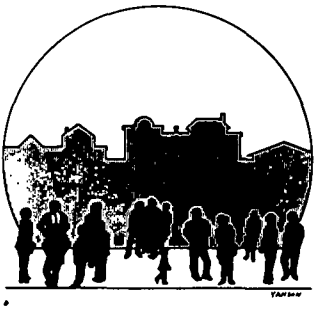
Funded By	Community Services Administration
Cost	$19,000
Congressional District	I
Compilation Date	February 1980

The Solar Energy Planning Study began in 1977 as a means of developing a low-cost solar heating system for use in homes in north central West Virginia. The study also examined the feasibility of a local non-profit industry that could manufacture solar collectors at a cost below the competitive market price.

Impressive conclusions were reached by the contractor, the Social Research Applications Corporation of Washington, DC; it found that solar heating and the establishment of a solar industry would be viable in West Virginia. Unfortunately, no action has been taken based on the feasibility study because of a lack of time and money to devote to such an effort, according to Kenneth Dean, Director of the CAA.

Drawings of the solar design were made by the project team's solar architect and were approved by the North Central West Virginia Community Action Association. The system featured a two-pass collector design, promised a useful life of 30 years, posed fewer maintenance requirements than liquid systems, and required a lower capital investment.

A full-scale working model was constructed to identify production problems and to determine heating efficiency. In addition to laboratory testing, SOLCOST, a solar computer program, was run on the economic, scientific, and geographic data for two sites in West Virginia--Elkins and Parkersburg. The analysis showed that the solar system was capable of fulfilling approximately 70 percent of the annual residential heating load, which compares very favorably with heating alternatives on the commercial market. Of further significance, immediate savings in monthly fuel costs (compared to those of operating an all-electric heating system) would accrue to the homeowner. During the first year of operation, it was estimated that, with an 11 percent FmHA loan, net cash flow for the



solar system would be positive; and within
years the solar system would pay for it-
self. Thus, the feasibility of the solar
design was demonstrated.

It was also determined through cost estimates supplied that the solar collectors, as designed, could be manufactured for as little as $ 7/square foot. This compares to $15-20/square foot for a comparable commercially manufactured solar collector. The advantages of local, non-profit production of solar collectors were apparent.

It was also concluded that government support of this program would be vital to ensure its success. The researchers concluded that the FmHA loan program should be tailored so that families with lower incomes could benefit from the construction of solar-heated homes.

Critique/analysis: Overall, the study indicates potential benefits for West Virginia and the nation. Construction of low-cost solar housing would show a commitment to renewable resources and reduce the demand for electric power. It would also reduce the monthly heating expenses of the homeowner through the use of a clean, safe energy source. Employment would be generated as a direct and indirect impact of the program. Finally, the implementation of this program would provide an excellent model for a non-profit solar industry serving other impoverished regions of Appalachia.

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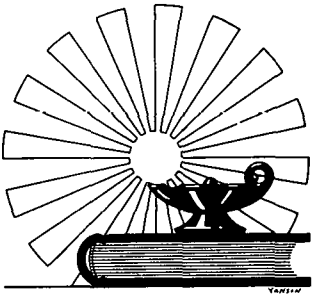
Category	Education
State	WV
Project Name	Alternate Energy Studies for Special Education Classes
Organization	Clay Battelle H_ School
Address	Drawer A, Blacksville, WV 26521
Contact	Jim Heady
Telephone	(304) 432-8208
Funded By	Clay Battelle High School
Cost	n/a
Congressional District	II
Compilation Date	February 1980

As a classroom activity, Jim Heady is having his special education students learn about alternative energy sources. His kids, grades 7 through 12, each wrote letters of inquiry to commercial producers of wind-energy equipment and are in the process of writing to solar equipment manufacturers for information on their products. From the information gathered, a brochure will be put together for use by others in the Blacksville community.

Heady conceived of the idea on his own and includes the activity as part of social studies, the traditional curriculum. One of the reasons for having his students study alternate energy sources is that "the future is for them." He belives that the future will include solar and wind energy systems, and he wants his students to be prepared to live in the future.

The school administration supports Heady totally and has provided the money for stamps and envelopes. The principal has also encouraged Heady to write a proposal, requesting support for alternate energy education, as well as life-skill activities, for the handicapped.

Critique/analysis: Unfortunately, the rate of response to the students' inquiries has not been very high.



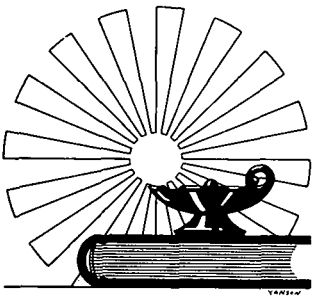
Renewable Resources—A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Community Program for Energy Conservation

Southern West Virginia Community College has developed a comprehensive community program to encourage the growth of the energy-conservation ethic and to present energy-conservation strategies that the individual can implement cost-effectively.

The program material is prepared in the form of videotapes, slide-tape programs, and printed materials to support the audio-visuals. The completed programs are disseminated via state public television, WVU Extension Service, and group meetings.

Organization	Southern West Virginia Community College
Address	Logan, WV 25601
Contact	Randy Carpenter
Telephone	(304) 752-5900
Funded By	Higher Education Act Title I, FY 1978; Southern West Virginia Community College
Cost	$54, 195
Congressional District	IV
Compilation Date	February 1980



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Category	Education
State	WV
Project Name	"Con erg"- Conservation of Energy

Through federal Title IV - C grant funds, the Regional Education Service Agency (RESA) V was funded to conduct this three-year project to save energy in the 124 schools of this eight-county educational region. Mohammad Yazdi, an energy engineer who as hired to coordinate the program, is exposing area residents to a variety of conservation methods. One way has been to experiment with the design, construction, and operation of a few solar collectors himself as an example. With no prior experience, Yazdi built collector, at moderate cost ($95, including a few tools), that is maintenance-free, clean, and quiet. Yazdi feels it would work very well to help warm schools because the most effective solar hours are between 8:30 a.m. and 4 p.m. - school hours.

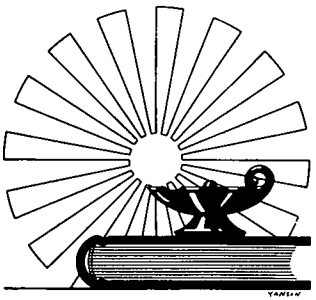
Yazdi's solar experimentation led him to another collector, one recently built (with his help) by Worthington Elementary School personnel. It will be used to heat one classroom and will provide information needed for purchasing others. The collector, built for about $200, was fashioned exclusively from new materials.

Another project of Yazdi's is a heat exchanger for the gas forced-air furnace at the Sisterville Middle School. This device has worked very well to save the school energy and money. The heat exchanger, attached to the flue of the school's present heat equipment, raises the temperature of the return air before reaching the furnace fan room. Consequetly, this additional heating requires no extra energy use.

Yazdi is also working on a project that would put water to work in area schools as a source of energy. He has proposed placing a small hydro-electric generator on the Little Kanawha River. Public support of the project, which could supply

Organization	Regional Education Service Agency V (RESA)
Address	121013th Street Parkersburg, WV 26101
Contact	Mohammad Yazdi
Telephone	(304) 485-6514

Funded By	County School Boards; ESEA Title IV - C federal funding
Cost	$35,000/year
Congressional District	I
Compilation Date	Feburary 1980



at least three nearby schools with additional energy, is being sought to help in getting federal funding.

A conference on solar energy was sponsored he RESA V early this year for professionals he area. Approximately 70 architects, ome builders, developers, engineers, appraisers, code officials, and plumbers attended the conference, which presented detailed technical information on every phase of solar systems. A public conference to stimulate consumer interest in solar programs followed the technical conference.

Unfortunately, this three-year program will be ending shortly. It is not known if an effort will be made to obtain more funding.

Renewable Resources— A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Energy Awareness

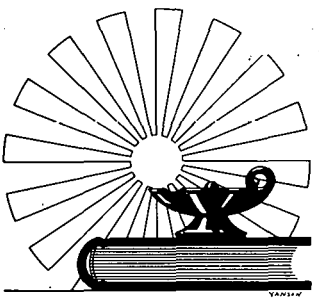
The Division of Extension and Continuing Education at WVIT, in cooperation with the School of Engineering and Physical Sciences and the Community and Technical College, has prepared an educational "package" on energy conservation. It includes a slide and transparency show, free pamphlets, and lists of tips; a qualified person makes a presentation and directs discussion. The entire package called "Energy Awareness," is taken around to civic and community groups--Lions, Civitans, Ruritans, Senior Citizen Centers, Community education projects, etc.

Audiences are told about global energy resources, new developments in supply, and the nature of the energy crisis. A basic lexicon of energy terms is given, and conservation measures, problems and costs are discussed. Presenters are instructed to follow the audience's lead, and, depending upon the length of the session and the preoccupations of the audience, to cover a variety of other conservation/awareness related topics.

In conjunction with its formal energy-conservation project, the Division has conducted several community projects: an Energy Awareness Week, classes in energy conservation for area high schools, workshops, distribution of household audit materials, and the display of conservation window stickers in businesses, institutions, and households.

Organization	WV Institute of ....., Div. of Extension & Continuing Education
Address	Montgomery, WV 25136
Contact	Ken C. Burrows
Telephone	(304) 442-3200

Funded By	WV Institute of Tech.; Title I Higer Education Act-FY 1978
Cost	$36,706
Congressional District	II
Compilation Date	February 1980



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Category	Education
State	WV
Project Name	Energy Conservation Workshop
Organization	Glenville State College
Address	Glenville, WV 26351
Contact	Dr. Mary Jo Pribble
Telephone	(304) 462-7361
Funded By	Glenville St. College; Title I - Higher Educ. Act - FY 1978
Cost	$3,497
Congressional District	III
Compilation Date	February 1980

The Energy Conservation Workshop of Glenville State College is directed to homeowners, construction personnel, and teachers.

Energy conservation in presently existing structures was the topic of the first session. A film, "The Defensive Line," identified the portions of the home that need to be insulated and showed how the various types of insulation are installed. Sources of heat loss, weatherstripping and other types of weatherization and storm windows were also discussed.

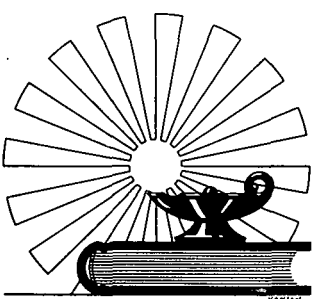
The second session, energy conservation in home heating, considered various fuels used in heating and how they can be used efficiently. Careful control of thermostats was stressed, as well as proper servicing of heating systems.

Energy conservation in the operation of the home, the third session, was presented by representatives of the Monongahela Power Company. Results of a study that involved metering individual appliances in a typical home were discussed.

The final session, energy conservation considerations in design of homes, stressed the importance of site and design in energy conservation. Comparative figures on energy consumption for homes having varying amounts of insulation and other design features were discussed.

Although the anticipated number of people didn't attend the energy-conservation workshop, t[illegible]action of those who did attend, according t[illegible] Mary Jo Pribble who conducted the work[illegible], indicated success.

The energy conservation workshop at Glenville was a one-time affair, but Dr. Pribble has continued to hold workshops for local organizations. (Any organization interested in having a workshop should contact Dr. Pribble.)



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Energy Education: Concepts and Dilemmas (EECAD)

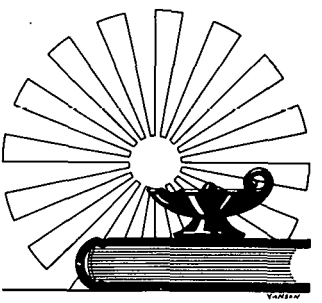
Twenty-five junior and senior high school teachers from a variety of disciplines were brought together to develop interdisciplinary instructional units for energy education. Teachers came from the tri-state area of northern West Virginia, southeastern Ohio, and southwestern Pennsylvania. They were selected from at least ten different schools.

The teachers were presented with a broad perspective of energy, energy education, and the relationships between energy and social change. Ten interdisciplinary energy projects were implemented, one in each of the ten high schools represented.

Documentation of the workshop and energy activities were disseminated through the ERIC Clearinghouse for Math, Science, and Environment and through other channels appropriate for reaching teacher educators, administrators, and high school teachers.

Organization	Technology Education Program, College of Human Resources and Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	David McCrory
Telephone	(304) 293-5439 (304) 293-3191

Funded By	U.S. Energy Research and Development Admin. (ERDA); Faculty Development Programs in Energy
Cost	$19,782
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Energy Education and Energy Extension

Organization	West Virginia Univ. Center for Extension & Continuing Education
Address	716 Knapp Hall West Virginia Univ. Morgantown, WV 26506
Contact	Dr. Kathleen Bissonnette
Telephone	(304) 293-5467

Funded By	U.S. Dept. of Energy; WV Fuel and Energy Office
Cost	$290,000, FY 1980
Congressional District	II
Compilation Date	February 1980

Since 1978, the WVU Extension Service has offered general energy and energy-conservation education to homeowners, farmers, small businesses, and youth.

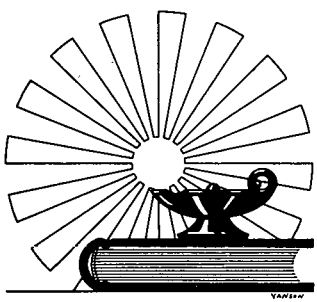
A full-scale program is being formulated for a state-wide, multi-component Energy Extension Service for start-up in FY 1980. The State Fuel and Energy Office received $360,000 from DOE, and $290,000 of this grant will be allocated for the development of the Energy Extension Program in Morgantown, WV. Starting sometime after January 1, 1980, funding will continue for three years, or for as long as annual funding is renewed. Conceptually, Energy Extension will be integrated into the operations of the Center for Extension, so that, if funds are cut off, the program could continue.

Energy Extension, as it is now proposed, will consist of four components. Energy management programs for small businesses, commercial small farmers, and residential consumers will train energy extension personnel to offer various audits, workshops, and technical assistance.

"Energy education for educators" will be a three-credit, teacher re-certification course offered through Curriculum and Instruction at West Virginia University and will feature an interdisciplinary systems approach. In its second year, the course (it is hoped) will be e[illegible]d to the five WVU Graduate Centers, then o[illegible]i state-wide.

The Energy Council Project, directed at community development work, will involve encouraging county and local people to take energy decisions into their own hands.

Innovative Energy Education will be a program for soliciting and implementing proposals from teachers, clubs, and citizens. Innovative ideas on how to educate about energy will be encouraged. The goal is to fund two projects a year for $1,000 each.



Critique/analysis: The regional office fears that the proposed program is too large, especially since the Center does not plan to add more professional personnel to its staff.

The proposed plan for Energy Extension represents the first major energy education effort by the State Fuel and Energy Office. Although the emphasis is not on renewable resources, but on energy conservation, the effort is needed and should benefit the state and its citizens.

Renewable Resources—A National Catalog of Model Projects

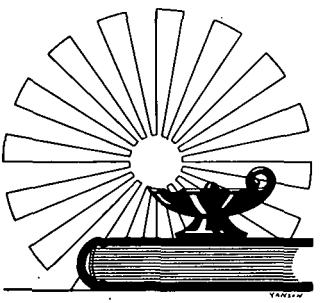
Category	Education
State	WV
Project Name	Energy Management

The purpose of the Energy Management project was to provide secondary teachers, adult educators, and extension personnel with information to increase their awareness and understanding of energy management. Summer workshops were conducted and teaching modules developed.

Three West Virginia counties have held adult classes on energy management. Through them, approximately fifty adults have received information on the energy situation and on ways to save energy in the home.

Organization	West Virginia Univ., Family Resources
Address	702 Allen Hall Morgantown, WV 26506
Contact	June Veach
Telephone	(304) 293-3402

Funded By	Title I Higher Education Act FY 78
Cost	n/a
Congressional District	II
Compilation Date	February 1980



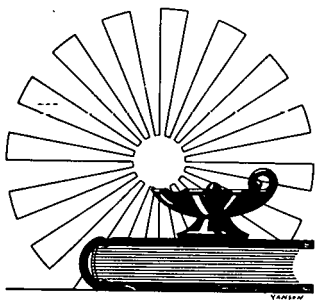
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Experimental Electric Vehicle and Electric Vehicle Demonstration Project
Organization	Technology Education Program, College of Human Resources & Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	Dave DePue
Telephone	(304) 293-3803
Funded By	DOE (demonstration project)
Cost	$492 (experimental electric vehicle); $10,900 (demonstration)
Congressional District	II
Compilation Date	February 1980

The experimental electric vehicle was originally conceived in 1976 by former graduate students Mark Skinner and Randy Hamme, in response to a challenge from an instructor to build a vehicle that is clean, quiet, efficient, and has a minimum impact on the environment. They assembled the vehicle from a worn-out Volkswagen bus and used nearly all recycled materials for most parts.

The vehicle was exhibited at the Appropriate Community Technology Fair and Conference in Washington, DC, in April 1979. While in Washington, the vehicle was used to transport members of the House Committee on Science and Technology to the hearings on appropriate technology held at the fair site. The electric van is not meant to be a dependable vehicle, but primarily to serve as a demonstration of the principles and possibilities in constructing an electric vehicle.

A West Virginia University proposal was recently funded by the U.S. Department of Energy to manufacture an electric vehicle and use it in normal fleet operations, and to demonstrate and study the vehicle. Its acquisition is expected in February 1980. The vehicle is going to be assigned to the University's Physical Plant Department, where it will be used for fleet operations three days a week. At other times, Technology Education will demonstrate the vehicle to the public and to groups of citizens in the region. Instrumentation for data collection will be an integral part of the project and will help provide the base for evaluation of the feasibility of expanding the use of electric vehicles.



Renewable Resources—A National Catalog of Model Projects

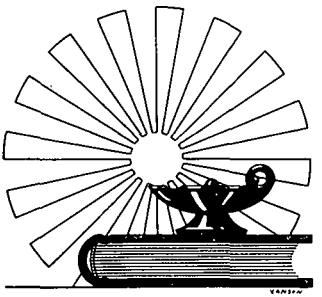
Category	Education
State	WV
Project Name	Home Energy Conservation Training Program (HECTP)

The Home Energy Conservation Training Program was designed to train 100 community specialists to conduct local workshops and training sessions for individuals and community groups on energy conservation and weatherization. The community specialists represented public service agencies and civic groups.

First, contemporary and practical techniques of home weatherization and energy conservation were demonstrated to the community specialists. The specialists were then trained in methods of presenting home energy-conservation workshops and training sessions. Resources and assistance were provided the specialists in conducting their workshops, which approximately 2,000 community residents attended.

Organization	Technology Education Program, College of Human Resources and Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	Mike Vogel, Karl Hans, Dave McCrory
Telephone	(304) 293-3191 (304) 293-5439

Funded By	Higher Education Act Title I, FY 1978
Cost	$24,421
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

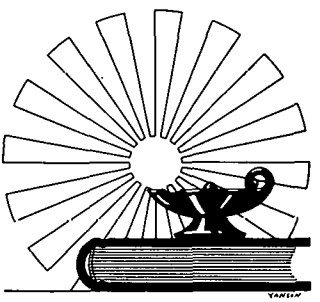
Category	Education
State	WV
Project Name	Home Energy Conservation Workshop Program (HECWP)

This program presented 20 workshops to groups of concerned West Virginia citizens to provide skills, methods, and resources in home weatherization and energy conservation. Each workshop was tailored to the needs of the specific group attending--mobile home owners, senior citizens, low-income persons, or the general public.

Specific groups were identified by various local organizations who also gained experience in conducting workshops. As a result of the workshops, the organizations and workshop participants became more aware of energy conservation and resources. Exhibits and resources were created for use by the local organizations for continuing and enlarging their energy-conservation efforts.

Organization	Technology Education Program, College of Human Resources and Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	Mike Vogel, Dave McCrory
Telephone	(304) 293-3191 (304) 293-5439

Funded By	Higher Education Act Title I, FY 1977
Cost	$24,996
Congressional District	II
Compilation Date	February 1980



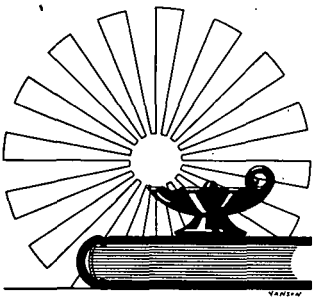
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Integrated System

Woodlands Institute, a school dedicated to using the out-of-doors as a classroom, has been in operation for six years. It consists of a group of people dedicated to education and living in an environmentally non-exploitative and cooperative manner. Many students and visitors come through the Institute each year.

On-site at Woodlands Institute is a 4,000-kilowatt windmill used to provide energy for a personal dwelling. Once construction is completed, this house will also utilize passive and active solar energy.

Organization	Woodlands Institute
Address	Spruce Knob Mountain Cherry Grove, WV 26803
Contact	Anyone there
Telephone	(304) 567-2632
Funded By	Private
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

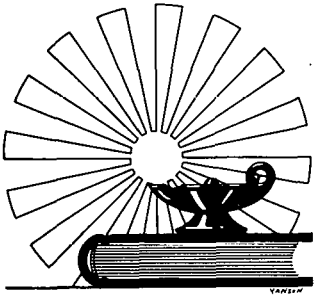
Category	Education
State	WV
Project Name	"Learning to Live With Winter"

Although the primary focus of the Oglebay Institute is nature and environmental education, included in some of their educational efforts is information on renewable energy. One all-day workshop offered to the general public each fall, "Learning to Live With Winter," displays exhibits on wood-burning stoves and solar equipment.

Many of the programs offered to local schools by the Institute promote solar energy as an alternative to fossil fuels. Solar cookers, heat grabbers, and passive solar systems are demonstrated to the students during these sessions.

Organization	Oglebay Institute
Address	Oglebay Park Wheeling, WV 26003
Contact	William Beatty
Telephone	(304) 242-6855

Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980



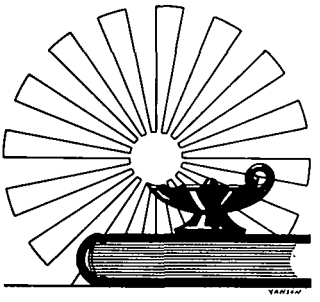
Renewable Resources— A National Catalog of Model Projects

Category	Education
State	WV
Project Name	New River Energy Center (NREC)

The New River Energy Center is basically an educational effort in energy alternatives. The group publishes a newsletter, The Energy Enquirer, which features basic information on solar collectors, appropriate technology, and legislative reports. The NREC has been working on developing a library and monitoring energy events.

A project of singular importance to the group is working with Women's Resource Center to build a shelter for battered women. NREC is to provide technical and design assistance in the construction of the shelter's solar greenhouse and solar water-heating system. When complete, the shelter will serve as a demonstration project and provide NREC staff with office space for three years.

Organization	New River Energy Center, Inc.
Address	Box 1341 Beckley, WV 25801
Contact	Larry Ballard Terri West
Telephone	(304) 253-7852
Funded By	CETA
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

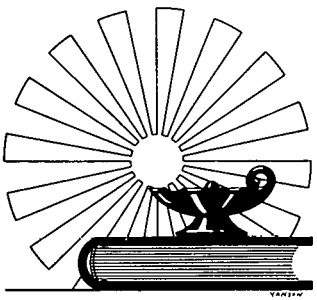
Category	Education
State	WV
Project Name	Solar Heated Model House

Charlie Jenkins entered a model-scale solar-heated house in his high school science fair, and he has been testing it ever since.

The model, made almost entirely out of masonite, is scaled to the Thomason "Solaris." Built by Jenkins in 1976, it uses the sun's heat to warm water, which is then used to heat the model. A pump and fan are included in the model.

Jenkins, who has learned much about solar energy from the model, believes it is an excellent teaching device. He encourages others to build models and believes that nearly anyone could construct a full-size solar house from the model's plans.

Organization	Charlie Jenkins
Address	42 Orchard Street Keyser, WV 26726
Contact	Charlie Jenkins
Telephone	(304) 788-1587
Funded By	Owner
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

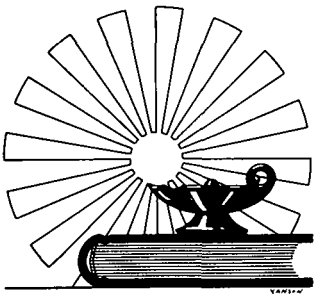
Category	Education
State	WV
Project Name	Solar and Wind Utilization Research
Organization	West Virginia Univ., Aerospace Engineering Department
Address	Morgantown, WV 26506
Contact	Dr. Richard Walters Dr. John Loth
Telephone	(304) 293-4111
Funded By	ERDA, DOE
Cost	n/a
Congressional District	II
Compilation Date	February 1980

The Department of Aerospace Engineering of West Virginia University has been researching high technology approaches to renewable energy systems. A research project was begun in 1975 to investigate the technical and economic feasibility of vertical axis wind turbines and innovations in blade aerodynamics. Research continues into the potential of a circulation-controlled vertical axis wind turbine (CC VAWT), which is a vertical axis turbine that uses straight blades composed of airfoil shapes having a high efficiency.

Early in the project it was recognized that extensive theoretical and experimental research efforts were required. Initial theoretical work, based on aerodynamic strip theory, indicated that circulation control increased the turbine's operating efficiency while lowering the rotational speed at which peak efficiency occurred. Because of some uncertainty as to the accuracy of the results, the research effort has continued in two areas: the development of a more aerodynamic solution and the construction of an outdoor test model VAWT. An indoor facility for testing rotating blades is also being used.

The Department's research on solar energy began in 1976 when Dr. J. L. Loth invented a new type of solar air heater. This led to a 1977 DOE contract to investigate the thermal performance of the collector. A 36' x 16' [illegible]ne solar test facility was therefore con[illegible]ted on the roof of the Engineering Sciences Building. The solar project is fully equipped and instrumented.

Besides conducting research, the Department of Aerospace Engineering also offers a course called Solar and Wind Energy Utilization.



Renewable Resources— A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Technology Education Program

Since 1970, the Technology Education Program has been examining technology and its social implications. The primary mission of the Program is to study humankind's endeavors to create and utilize adaptive systems-- production systems, communication systems, and transportation systems-- and how these system relate to human beings, societies, and social purposes.

The Program has been involved in broad-based educational efforts throughout the state that have focused on energy and on the environmental and educational ramifications of technology. This outreach has generated many innovative strategies for change in the formal education setting as well as in local communities. Some of the results of this work have been community-wide home energy conservation projects, innovative school curricula at the elementary and secondary levels, and school personnel development programs that cover energy, metrics, instructional strategies, environmental education, and other topics.

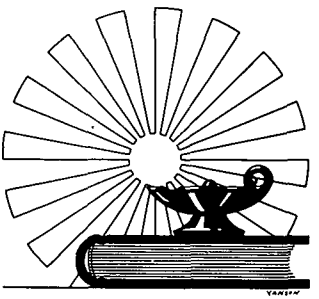
The Technology Education Program is also involved in the research, design, demonstration, and evaluation of technology within both technical and social/cultural frameworks. Renewable resource tehnologies and energy-conservation techniques are two examples of appropriate technologies whose ability to meet human needs is studied by program participants.

Critique/analysis: The Technology Education Program is not without problems. Funding in these lean years is one. In addition, because the Program goals and perspectives are relatively unique and broad, it is often with difficulty that others understand what Technology Education is.

The Program's former and current students are considered the area experts on renewable energy.

Organization	Technology Education Program, College of Human Resources & Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	Paul DeVore
Telephone	(304) 293-3803

Funded By	WVU, County Board of Education, private & public R&D programs
Cost	Varies with projected program
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
State	WV
Project Name	Technology Education Research & Demonstration (TERAD) House

The TERAD House is an in-process project now, and always will be. It was a partially dilapidated house on the edge of the university campus. It was slated for destruction in the summer of 1978, but the Technology Education people requested that the house be turned over to their program, to be used as a community education project in low-cost housing rehabilitation, passive solar retrofit, appropriate technology, and energy conservation.

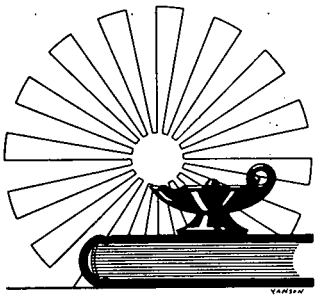
As part of their academic program, three to six students gain "hands on" experience related to their course of study by working on the TERAD House. Since its acquisition, the house has been structurally repaired and partially insulated. Its windows have been reglazed, its back yard gardened organically in raised beds, and its sun porch converted to a solar greenhouse. Two to three students and friends have done most of the work on the greenhouse retrofit. The insulation and window glazing were done by CETA workers, free of charge to TERAD. The woodstove that heated TERAD last winter was from a local business interested in testing the product.

TERAD will continue onward in this do-it-yourself vein, recycling materials and utilizing existing resources. TERAD plans include a passive solar vertical wall collector constructed ı recycled glass and steel, insulated shutters ıg recycled materials, window box collectors, ıandscaping for energy conservation, an attachable winter entry lock, and an insulated door.

The back yard is also the site of several student projects, including a solar cold frame, a solar food dryer, and a mini-demonstration of solar water-heating. Most of these projects are constructed from recycled materials.

Organization	Technology Education Program, College of Human Resources & Education, WV Univ.
Address	609 Allen Hall Morgantown, WV 26506
Contact	Paul DeVore
Telephone	(304) 293-3803

Funded By	NCAT; WV Fuel & Energy Office; WVU; North Central Community Action Assoc.
Cost	Initial Cost: $11,880
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category Education

State WV

Project Name Weatherization Program

Organization West Virginia Student Public Interest Research Group (WV-SPIRG)

Address Student Office Wing Mountainlair, West Virginia Univ., Morgantown, WV 26506

Contact Cindy Bombino
Mike Bannon

Telephone (304) 293-3071

Funded By Student Government; North Central Community Action Assoc.

Cost n/a

Congressional District II

Compilation Date February 1980

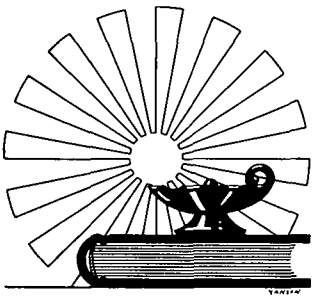
Originally catalyzed by Ralph Nader's efforts nationwide in the late 1960s, the WV-SPIRG at West Virginia University has continued to hang on. Its existence is viable in cycles, depending on shifts in leadership. Currently, the organization is made up of 25 undergraduate and graduate students and other University-related personnel. Six committees are guiding the direction of SPIRG this year—Energy, Environment, Consumerism, Special Projects, Office Administration, and Public Relations.

The Energy Committee coordinator came up with the idea of sponsoring a weatherization program for homes in Monongalia County. Student Action for Appalachian Progress (SAAP) is co-sponsoring the project. A workshop, conducted by Technology Education graduate students and held in late October 1979, drew 13 people who wanted to learn "how-tos" of basic weatherization--caulking, weatherstripping, insulating, etc.

Working as individuals and teams, the trained weatherizers will evaluate homes for weatherization needs. An application will then be filled out by the home occupant and filed with Community Action in Monongalia County. A Community Action committee will determine if the applicant is eligible for the home improvement at no cost. (To be eligible, persons must be permanent residents in the home in which they currently live and must meet set income standards.)

The program is targeted for low-income, elderly, and disabled residents. As a result of personal contacts, a number of consultations have already been held, with an energy audit performed and a check made for poor insulation, cracks in the foundation, and the need for weatherstripping and storm windows.

The North Central Community Action Association in Fairmont has agreed to pay for the weatherization materials. An aggressive publicity campaign will soon begin to advertise the program to Monongalia County residents.



Renewable Resources—A National Catalog of Model Projects

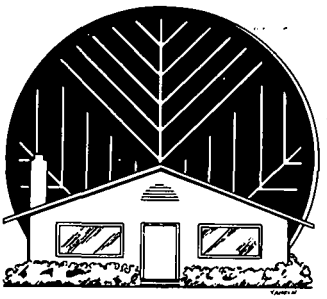
Category	Housing
State	WV
Project Name	Coal Field Housing

Coal Field Housing promotes energy conservation among miners and others whose jobs depend on the mining industry by providing housing near West Virginia mines. These housing projects enable miners to live in decent, moderately priced homes that are easily accessible to their place of employment. Before these housing projects were constructed, many workers commuted 80 miles or more each day, using huge quantities of gas and oil.

In 1976, planning for a 67-unit housing development in northwestern Raleigh County began. Construction started on three units in June 1979.

Coal Field Housing is a uniquely cooperative effort among coal-mining companies and nine UMWA southern West Virginia local unions. Although energy conservation is a major benefit of the project, its primary purpose is to provide good housing for miners.

Organization	Coal Field Housing
Address	119-1/2 Main St. Beckley, WV 25801
Contact	Deborah Tuck, Dir. Robert Krause, Architect
Telephone	(304) 255-4178
Funded By	Numerous
Cost	n/a
Congressional District	IV
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Home Built on the Arkansas Plan

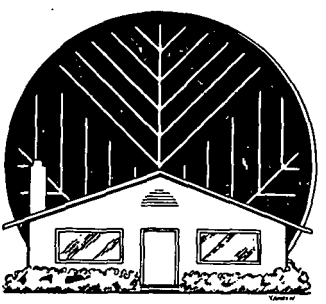
West Virginia resident David Hubbs had his home constructed according to the Arkansas plan, which was developed in the early 1970s as one of the first attempts to build a standardized home with energy-efficient design and construction features.

The Hubbs' 2,090 square-foot home maintains a temperature between 63 and 72 degrees F during the winter months. The range is achieved primarily by using a wood stove, which is located in the basement. (Because of the stove's location, air for it is not drawn through living quarters.) The house does have a heat pump, but it is turned off from December to February of each year.

Future plans call for the addition of a solar hot water preheater or a windmill.

Critique/analysis: Mr. Hubbs said that the wood stove should be located in the primary living quarters instead of the basement.

Organization	David Hubbs
Address	Route 40, Box 4C, Franklin, WV 26807
Contact	David Hubbs
Telephone	(304) 358-7785
Funded By	Owner
Cost	n/a
Congressional District	II
Compilation Date	February 1980



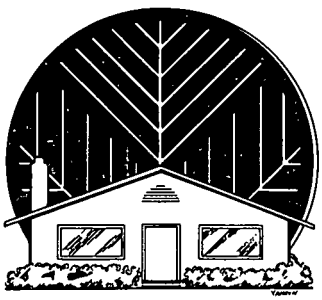
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Home Solar

Perceiving a continued rapid rise in energy costs, Falconer and Elisabeth Smith decided to make maximum use of solar energy. Therefore, since 1976, they have had installed a solar home space-heater with standard radiation absorbers and rock (or water) heat storage units, and a drain-down solar swimming pool heater. They are now also constructing a closed hot-water heating system.

These improvements are expected to pay for themselves within 10 to 15 years of completion. The Smiths are also planning to build a home that will be three-fourths underground, incorporating both passive and active solar heating to the greatest degree possible.

Organization	Falconer and Elisabeth Smith
Address	Box 536 Charles Town, WV 25414
Contact	Falconer and Elisabeth Smith
Telephone	(304) 725-8601
Funded By	Owner
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

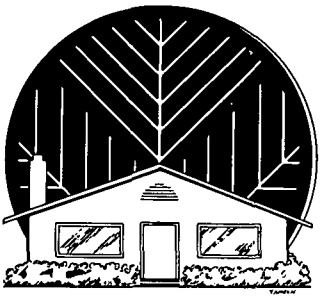
Category	Housing
State	WV
Project Name	Integrated System for Residence
Organization	Sol Arise Enterprise
Address	Route 2, Box 304 Phillippi, WV 26416
Contact	Marc L. Thomsen
Telephone	(304) 457-1617
Funded By	Private
Cost	Estimated $12,000 when complete
Congressional District	II
Compilation Date	February 1980

Once complete, this two-family residence will serve as a model home. It was designed in response to needs for self-sufficient living by two families--one of them on a fixed income. The residence will utilize a number of renewable energy and energy-conservation features: south-facing windows, a solar greenhouse with rock storage, a solar drain-down hot water heater with gas auxiliary, R-20 insulation, a wood-heating auxiliary, a methane digestor for organic wastes, and later, wind power electricity. Furthermore, protective planting will serve to conserve energy.

Five months into the project, sun tempering is partially operational, wood-heating installed, insulation of the first floor complete, and construction of the greenhouse under way.

Thomsen estimates that the total system will save 85 percent of heating fuel--75 percent of that being for hot water--and 90 percent of cooking fuel, when finished. All work has been done by Thomsen and his wife, he having had construction experience. Some salvaged materials from torn-down houses were used in this project.

Thomsen feels that more earth berming and a better construction site would improve the house, but access and soil composition have limited both.



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Owner-designed/built Solar Collectors & Attached Greenhouse

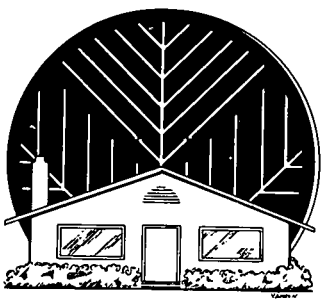
In the spring of 1977 William Jarvis, an ex-patent examiner for the U.S. Patent Office, started building a solar system. The 780 square feet of collectors and an additional 390 square-foot greenhouse will provide the main house with space heat and hot water. Storage will consist of 22 tons of rock and a 2,000-gallon water tank that has heat-exchange pipes for later use with steam. Initially, a wood furnace will provide back-up heat and, once installed, it will render the system operable when connections are made this fall.

Next year, Jarvis plans to utilize steam heat from a boiler that will drive a 40-kilowatt, electric generator for use during power outages. He also intends to build a windmill that, with a battery bank and converters, will meet nearly all of his family's electrical needs and provide back-up heating.

Jarvis has no doubts that the system will function well. He believes that the solar system alone will provide a minimum of 40 percent and a maximum of 70 percent of the hot water and space heat needed and that the storage will provide sufficient heat for three to four days with the steam back-up. His collectors are the subject of a patent application filed with the U.S. Patent Office.

Organization	William L. Jarvis
Address	Route 2, Box 162 Terra Alta, WV 26764
Contact	William L. Jarvis
Telephone	(304) 789-6004
Funded By	Owner
Cost	n/a
Congressional District	II
Compilation Date	February 1980

C ue/analysis: Incorporation of the solar c tors and greenhouse meant removing approximately 110 cubic yards of earth, shale and rock from around the Jarvis home. Jarvis, who removed earth by hand, isn't sure he would have personally undertaken the project had he known the time and work which was going to be involved. He therefore recommends using solar in conjunction with new home construction or additions.



Renewable Resources—A National Catalog of Model Projects

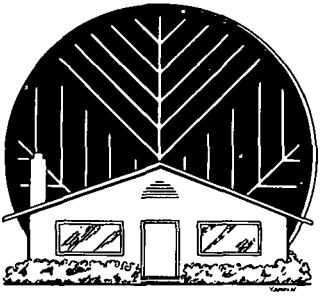
Category	Housing
State	WV
Project Name	Parsons Solar System

Conceived by Dale Parsons, this residential solar heating system features backyard-mounted solar tracking collectors and a 12,000-gallon water storage tank. Use of a concentrating collector minimizes the need for collector area (and attendant costs), increases effective storage capacity, and frees the structure of an array of panels. Each square foot of the concentrating collector is equivalent to approximately 3.5 square feet of an average solar panel.

In designing the system, Parsons' objectives were to develop a reliable, low-cost, efficient solar heating system to help overcome rising utility costs to develop a system that does not dictate or limit architectural treatment; and to make a system that is practical for the West Virgina climate.

The system should be completed by April of 1980. The projected average heating fuel savings are expected to exceed 50 percent.

Organization	Dale Parsons
Address	State of WV, Dept. of Health, Solid Waste Division, Charleston, WV 25305
Contact	Dale Parsons
Telephone	(304) 348-2987
Funded By	Owner
Cost	$6,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Rotor Wind Machine

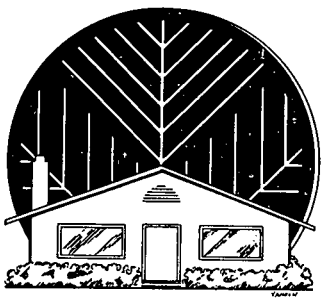
Inspired by reading Energy Primer, Wind and Wind Spinners and eager to build new things, Robert Decker constructed a three-tiered rotor out of oil drums. This rotor windmill is used at the Decker farm to charge storage batteries.

Originally connected to an automobile alternator, the vertical shaft of the rotor was placed on the upturned rear end of an automobile. The power was derived from the car's universal joint. The windmill functioned well, but the grease in the rear end and belts produced excessive friction. Decker is searching for a better transmission system and generator that requires fewer RPMs. This would allow for a more practical use of the generated power, such as for heating water.

Critique/analysis: Obtaining technical information on generators and locating reasonably priced pulleys and suitable pumps have been the major obstacles in the endeavor.

Organization	Robert L. Decker
Address	Route 1, Box 105 Reedsville, WV 26547
Contact	Robert L. Decker
Telephone	(304) 293-4495

Funded By	Owner
Cost	$100
Congressional District	II
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Rural Integrated System

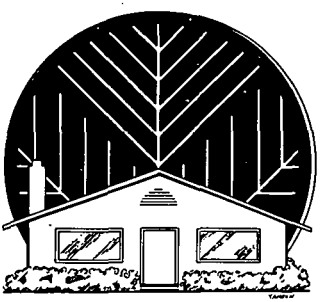
This project integrates a solar greenhouse, an algae and aquatic plant-growth pond, and a Chinese-designed biogas digestor. The construction began in April of 1979 and is now complete.

The greenhouse, facing south, is attached to the concrete-and-block digestor tank, and the pond is located on top of the tank. Materials used in construction include reinforced consrete and block, B-bond, discarded gas piping, polyurethane insulation, rough cut lumber, and glass.

Start-up of the pond and digestor is planned for March of 1980. Once operable, the anaerobic digestor will produce methane from organic wastes to replace kerosene for lighting and refrigeration, and wood for cooking. The remaining organic material will be used as farm fertilizer. A high-protein livestock feed will be produced from the algae and the aquatic plant growth supported by the pond.

This level of tight, simple integration is truly unique. The project treats wastes sanitarily, stabilizes wastes for pollution control, conserves nutrients for fertilizer use, and produces biogas, high-protein livestock feed, and food for human consumption. Because it allows for greater on-site production, the project conserves transportation fuel and reduces the amount of food, feed, and fertilizer necessary to operate the farm. This project is easily replicable since the level of technology and individual components can be varied to meet numerous situations.

Organization	Omega-Alpha Rec g Systems, Inc.
Address	Route 1, Box 51 Orma, WV 25268
Contact	Bob Hamburg
Telephone	(304) 655-8662
Funded By	Owner, relatives & friends
Cost	$6,000
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Sidwell Solar Home

This passive solar home was built by Patrick Sidwell, who had no previous building experience. Except for the excavation, the 24' x 34' house was built entirely without the use of power tools. Strictly conventional materials such as wood and concrete were used in the construction.

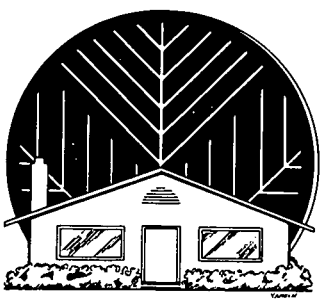
The house incorporates both a passive solar and an earth-berm heating system. The four-foot deep basement, which is entirely enclosed, provides heat from the earth, as well as storage space. Walls are insulated with six inches of fiberglass insulation, the ceiling with ten inches.

Along with a wood stove, an attached greenhouse will supply heat through its southern exposure of doble-paned windows. Good air circulation in the house is encourage by the 2-inch space between the floor and walls.

Sidwell has lived the past two winters in the house using only one cord of wood. If he lets the wood stove go out for a week, the minimum temperature of the house goes down to 45 degrees F. Consequently, heating involves raising the temperature from 45 to 68 degrees, which is relatively easy.

Critique/analysis: The house will be difficult to add on to because its concrete reinforced erblocks rise 4 feet above the floor line can be cut only with special power tools.

Organization	Patrick Sidwell
Address	Route 2, Box 142C Berkeley Springs, WV 25411
Contact	Patrick Sidwell
Telephone	n/a
Funded By	Owner
Cost	$10,000
Congressional District	II
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Solar Greenhouse

Figuratively speaking, Ed Klumpp killed two birds with one stone. The greenhouse he attached to his Morgantown home served as a project for his Master's Degree (Technology Education, West Virginia University) and enabled him to acquire knowledge of greenhouse construction principles. Klumpp, who had no prior construction experience, did nearly all the work on the 6' x 12' x 8' greenhouse.

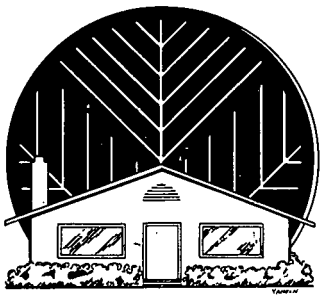
Two hundred gallons of water in milk jugs that were painted red and blue to optimize absorption serve as the primary heat storage. Secondary storage is provided by 15 tons of rock located underneath the greenhouse's gravel floor. An insulated night curtain and soil beds complete the project.

The Morgantown resident plans to experiment with various types of vegetables and plants, involving his entire family in the growing process. He also intends to record heat levels in case he should later decide to use the solar heat in his home.

Klumpp feels that anyone willing to take the time could build a similar greenhouse. That, he says, is what is unique about the project and about appropriate technology in general--it is within the layman's grasp.

Organization	Ed Klumpp
Address	224 Cherry Street Morgantown, WV 26505
Contact	Ed Klumpp
Telephone	(304) 296-1285

Funded By	Owner
Cost	$500
Congressional District	II
Compilation Date	February 1980



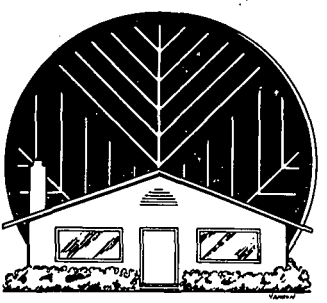
Renewable Resources—A National Catalog of Model Projects

Category	Housing
State	WV
Project Name	Wolford residence

In the Wolford residence, a waste heat recovery and water-heating fireplace with a 750-gallon hot water storage tank has been installed. The control system will allow for the integration of solar collectors, an absorption air conditioner, and microprocessor controls. The system will use solar and wood, with gas and electric back-up systems. Hot water from the solar system or water-heating fireplace is stored in the tank. When the thermostat calls for heat, a pump circulates hot water through the heat exchanger where it is forced into the air furnace duct and heats the circulating air. Should the hot water be insufficient, a gas solenoid valve will be activated and the system will operate as a conventional gas furnace. The home itself is insulated for efficient use of this system.

Jim Wolford's personal interest in socio-political-economic problems helped motivate him to undertake this project. He hopes that data he collects will prove of general use. Lack of time and lack of money have been deterrents to him.

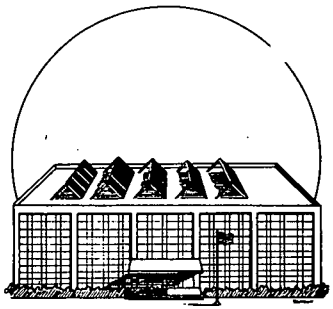
Organization	Environmental Engineering Association
Address	505 Randolph St. Charleston, WV 25302
Contact	Jim Wolford
Telephone	(304) 344-8801 (work) (304) 925-3810 (home)
Funded By	Private
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Institutional
State	WV
Project Name	Energy Literature Program
Organization	Mary H. Weir Public Library
Address	3442 Main Street Weirton, WV 26062
Contact	S. Fred Natale R. Heriot
Telephone	(304) 748-7070
Funded By	South East Library Association
Cost	n/a
Congressional District	I
Compilation Date	February 1980

In early 1979, the Mary H. Weir Public Library became a participant in the cooperative energy program of the South East Library Association. This program makes literature available to the public on alternate energy sources and energy conservation.



Renewable Resources— A National Catalog of Model Projects

Category	Institutional
State	WV
Project Name	Solar Heated College Conference Center

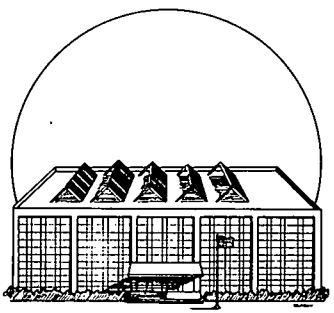
The Bethany College Conference Center/Hotel complex utilizes solar collectors to provide all the necessary domestic hot water and a substantial portion of the space heating for the facility. The hot water system is composed of 4,512 square feet of roof-mounted collectors that heat 6,000 gallons of water to 180 degrees F. It is connected to the domestic system through a heat exchanger. Another pump will be incorporated to course heated water through coils in the roof-mounted gas furnaces to preheat the air going to the blowers. Prior to March 1978, hot water was generated by electrical heating, which is now only auxiliary.

Construction of the hot water system was completed in January of 1979, a little more than ten months after it was begun. Currently, the system is monitored manually and logs are kept. More automatic monitoring would be desirable. The payback period is expected to be 17 years.

Bethany College made the decision to go solar when the unavailability of natural gas and the prohibitively high cost of electricity made the dining room facility it needed seem unfeasible. The College regards the project as a success and uses the facility for a wide variety of purposes.

Organization	Bethany College
Address	Business Office Bethany, WV 26032
Contact	David County John Graham
Telephone	(304) 829-7211

Funded By	ERDA, Bethany College
Cost	$273,956
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

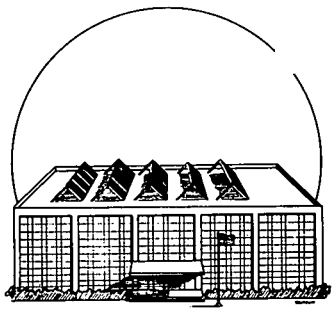
Category	Institutional
State	WV
Project Name	Solar Heated & Cooled Elementary School
Organization	Page Jackson Elementary School
Address	Route 1, Box 322M, Charles Town, WV 25414
Contact	John Ritchey
Telephone	n/a
Funded By	DOE; originally the Energy Research & Development Authority
Cost	$996,000 (solar installation)
Congressional District	II
Compilation Date	February 1980

The Page Jackson Elementary School is a school building that has a solar energy system for space heating and cooling the 52,000 square-foot building. The solar collectors are integrated into a sawtooth roof configuration with mirrored glass reflectors. The system has been in operation since September of 1978.

The facility was originally designed as a conventional school building. However, in response to the energy problems facing the local community as well as the nation, the Jefferson County School Board decided to modify its plans and make the facility a low-energy-utilization school. Under a proposal with the Energy Research and Development Authority, the school board retained a corporation to make the necessary engineering studies, designs, and specifications for installing the school's solar system. A number of energy conservation features, which alone reduce the heating load 30 percent below that of a comparable conventional school building, were at the same time incorporated into the design.

The project's goals transcend the construction of an economically feasible school building. It is also the purpose of the project to illuminate the possibility of solar applications for other buildings (residential and non-residential) in other parts of the state, to create a specifications test center for West Virginia schools, and to stimulate local industry by encouraging the local manufacture of solar systems and components (using local materials where possible).

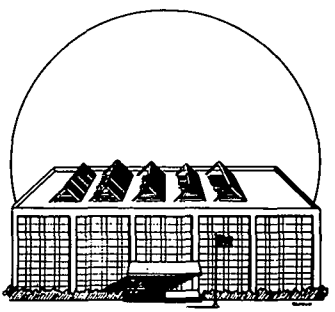
Although Potmac Edison does not make any rate adjustments for users of off-peak power, the Page Jackson back-up cooling system is designed to utilize as much power off-peak as possible. The school intends to try to convince the power company to set lower rates for low-energy schools by providing it with evidence that the use of off-peak power will reduce the utility's capital costs and operating expenses.



Renewable Resources— A National Catalog of Model Projects

By making information available to the public, the Library Commission promotes renewable energy conservation. As a participant in the Solar Technology Transfer Program, the Commission acts as a back-up source on solar energy information for all academic and public libraries in the state.

Category	Institutional
State	WV
Project Name	Solar Technology Transfer Program
Organization	West Virginia Library Commission - Reference Department
Address	Science & Culture Cen. Charleston, WV 25305
Contact	Shirley Smith, Karen Goff
Telephone	(304) 348-2531 (304) 348-2029
Funded By	n/a
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	WV
Project Name	Athens Research Facility

A tarpaper shack in Athens, West Virginia, is serving as a low-income research facility. Under investigation at this facility are the usefulness of recycled building materials, passive solar heating, and small-scale electrical generation for those in the lower economic strata.

This shack, heated with a passive solar system, was designed by Mary Ellen Griffith, it will have all of its electric needs met by a 780-watt capacity windmill, which was under construction in late 1979. The windmill, engineered by Brik Miller, is a Savonius Rotor aeroturbe made from barrel halves mounted on a central rotor. The barrel halves drive an alternator from a Cadillac car, and the power so generated is stored in four automobile batteries.

This decentralized windmill is non-polluting, easily replicable, and composed almost entirely of salvaged materials.

The windmill requires a minimum wind—eight miles per hour--which this elevated West Virginia location routinely receives.

Organization	Anarchie Aerotu[illegible]s
Address	Box 111 Athens, WV 24712
Contact	Brik Miller Mary Ellen Griffith
Telephone	n/a
Funded By	ACT 1979; Individual
Cost	$400
Congressional District	IV
Compilation Date	February 1980

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	WV
Project Name	Composting Toilet

Organization	Jon Averill
Address	Box 40 Brooks Route Hinton, WV 25951
Contact	Jon Averill
Telephone	(304) 466-1642 (home) (304) 466-4785 (work)

Funded By	Private; National Ctr. for Appropriate Technology (NCAT)
Cost	n/a
Congressional District	II
Compilation Date	February 1980

According to Jon Averill, composting toilets are a good alternative to the reportedly inefficient sanitation systems of West Virginia. Not only does the waterless toilet lessen the need for costly, energy-intensive, centralized sewage plants, but it also recycles human and kitchen waste into usable compost; saves water; and eliminates huge amounts of toxic blackwater. The toilet reduces by 40 percent the waste water and fresh water consumed, turning former wastes into a rich humus suitable for use on fruit trees and flower beds.

The unnecessary expense and manufacturing defects of many commercial composting toilets led Averill to design his own model. The system consists of a wood frame, ferrocement tanks with air intake and exhaust, commode, and "solar window" flying insect trap. This model began operation in August of 1979 at a low-income residence in southern West Virginia. A small leach field still needs to be constructed, and the system has not yet been inspected by health officials.

Information on this model can be obtained through the National Center for Appropriate Technology's report, Owner-Builder's Composting Toilet Manual. NCAT partially funded Averill's project after 18 months of confusing delays.

ique/analysis: Averill recommends that this otype unit not be replicated exactly, but ___ead be adapted to fit individual needs.

Averill is planning a new model that will use ferrocement as the base, the wall, and the inside ceiling. An "air staircase" made from welded rod and ferrocement will aerate and slide the pile. A two-chamber design will ensure that waste matter removed will not be contaminated by any fresh material.

Renewable Resources— A National Catalog of Model Projects

Category	Low Income
State	WV
Project Name	Home Repair/ Weatherization for Low-income

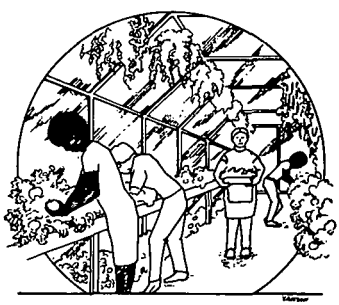
Roane County is one of ten counties participating in the West Central Community Action Association (CAA) program, which benefits low-income and elderly persons. CETA workers in this program weatherize homes to conserve energy, reduce fuel costs, and protect the health of the low-income citizen. The CAA also helps families obtain financial aid and helps to bring homes up to minimum housing standards. Through representation on the Roane County CAA Board of Directors and on the Home Repair Committee, target area residents and program participants assist in the development, implementation, and evaluation of the weatherization project.

This program grew out of a 1969 needs survey conducted by the Community Services Administration. Of the five priorities determined in the area, one was identified as being weatherization and home repair. A basic CSA grant was awarded to the West Central CAA, which allocated the monies to the county Community Action Associations based on their working population. Although the Roane County CAA is in constant need of additional funds, 33 homes were weatherized last year at a cost of $400 each. The project is being replicated in "Care and Share Housing," operated by the Glenmary Priests of a local church.

Critique/analysis: The county CAA's have no authority and rely on the regional office for money and directives. This seems inappropriate considering that regional action is based on a ten-year-old needs assessment. A reassessment would probably lead to a change of priorities and focus.

Organization	Roane County Community Action Association, Inc.
Address	P.O. Box 592 Spencer, WV 25276
Contact	Mary Brabham
Telephone	(304) 927-1884

Funded By	DOE & Community Services Admin. (CSA)
Cost	$13,200 1978-1979 ($400/home)
Congressional District	III
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Low Income
State	WV
Project Name	Recycling and Weatherization Program

The Federal Government's Recycling and Weatherization Program, begun in 1977, provides funds for developing recycling centers and weatherizing the homes of low-income persons. In West Virginia, the funds are administered by the State Office of Community and Economic Development.

The Fayette County Committee on Aging, a sub-sponsor, has established a collection center for glass and aluminum, has provided services for elderly persons with Green Thumb employees (who are themselves low-income, age 55 and over) and outreach workers, and has established services to weatherize the homes of low-income residents of the community.

The Committee estimates that the weatherization program cuts the heating bills of clients by one-third to one-half in the winter following installation.

Organization	Fayette County Committee on Aging
Address	102-A Hunter St. Oak Hill, WV 25901
Contact	Gladys Gray
Telephone	(304) 465-8484
Funded By	Federal Government Recycling and Weatherization Program
Cost	n/a
Congressional District	II
Compilation Date	February 1980

Renewable Resources—A National Catalog of Model Projects

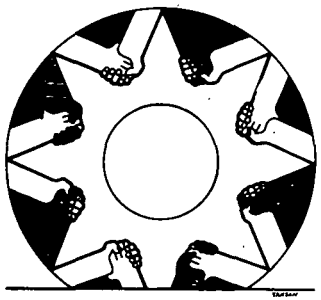
Category	Outreach
State	WV
Project Name	Citizen/Labor Energy Coalition

The West Virginia Citizen/Labor Energy Coalition (WV-C/LEC) is the result of a merger of the labor constituency and a small group of citizen activists. The groups organized to oppose electric utility practices before the Public Utilities Commission and elsewhere.

The Coalition promotes the use of the most efficient fuel by homeowners, industry, and business. This includes advocating the use of insulation and other energy loss-reduction practices. It is promoting a "citizens'" energy program as an alternative to the Carter Administration's plan. Conservation is a stated goal of the West Virginia group.

Generally, WV-C/LEC promotes energy policies that benefit consumers. These include, the group believes, conservation, the development of renewables, and the development of coal.

Organization	West Virginia Citizen/Labor Energy Coalition
Address	12 Capital Street Charleston WV 25301
Contact	Mary Falbo, Chairperson
Telephone	(304) 442-2809
Funded By	Labor Union Designations; Contributions
Cost	n/a
Congressional District	III
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	WV
Project Name	Eastern Panhandle Appropriate Technology Group
Organization	Eastern Panhandle Appropriate Technology Group
Address	P.O. Box 173 Kearneysville, WV 25430
Contact	Karl Hess
Telephone	(304) 263-7526
Funded By	Participant donations
Cost	n/a
Congressional District	II
Compilation Date	February 1980

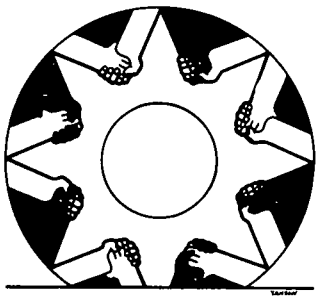
An informal appropriate technology network, the Eastern Panhandle Appropriate Technology Group serves as a forum for sharing information, making inquiries, and exchanging resources. Each meeting is held at a different site in Jefferson, Berkeley, or Morgan Counties and is open to the public. Discussion, which is very flexible, frequently is generated by the meeting site itself and usually directly relates to an AT issue.

About 200 people are listed as participants in the Group meetings, which are guided fully by democratic processes. There are no officers, no agendas, no members per se, and no dues. At each meeting, expenses are met by taking up a collection, and duties for particular activities are accepted.

Making policy statements is not the purpose of the Group. Its participants speak through individual action and in the forum exchange, the spirit of which is that anybody can be involved in technology. Several participants have or are building their own earth-bermed or solar homes, greenhouses, food dryers, and other appropriate technology projects. Several others are beginning a course at the Adult Evening and Community Education Center on energy conservation and renewable energy.

Recently, the Group has become involved in a l lobbying and organizing effort to remove state's legislative disincentives to installing home solar systems. In particular, the focus is on excluding solar equipment from property tax assessments. In addition, they received a small grant for Sun Day and organized five days of activities in a two-county area.

Critique/analysis: The Group began spontaneously three years ago through the efforts of four individuals who placed in storefront windows posters announcing the first meeting. The response was overwhelming and interest continues



to be high. Usually, 30 to 40 people attend each meeting. A crayon and some spare pieces of paper are all that is needed to replicate the organization of such a group. Patience, publicity, persistence, and postage are the necessary elements in such an effort.

Renewable Resources—A National Catalog of Model Projects

Category	Outreach
State	WV
Project Name	Energy Fairs and Booths

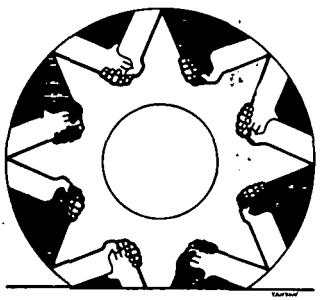
Organization	League of Women Voters of West Virginia, Inc.
Address	6128 Gideon Road Huntington, WV 25705
Contact	Helen Gibbons, Pres.; Tom Dunham, Marion Weiser, Proj. Mgrs.
Telephone	n/a

Funded By	DOE through National League of Women Voters
Cost	$2,100
Congressional District	I, IV
Compilation Date	February 1980

A Fairmont, West Virginia, indoor mall was the scene of the first League of Women Voters' energy fair. Twelve exhibits were displayed, featuring all the sources from which power/fuel/energy are generated. Films and other audio-visual programs ran continuously and a variety of literature was handed out.

The project's second phase focused on Huntington, West Virginia, where the local League of Women Voters sponsored an energy booth in the annual Huntington Home and Garden Show. The booth displayed models of various alternative resource technologies, slides of a proposed retrofit solar energy system for a local library, and various passive energy-savers (such as thermal curtains). League members answered questions and passed out energy literature. Six thousand people attended the show during its five-day run.

The largest League fair was held at Parkersburg. The fair's 20 exhibitors, including representatives of government, industry, utilities, and professional organizations, covered all sides of the energy picture—from energy exploration to production to consumption. No commercial or retail exhibits or exhibitors were permitted. Scale models, films, and literature displayed at the fair attracted over 60,000 people, including 600 schoolchildren on field trips.



Renewable Resources—A National Catalog of Model Projects

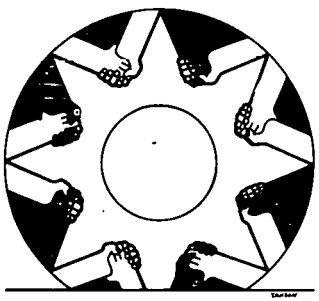
Category	Outreach
State	WV
Project Name	Retain the Train

Retain the Train was begun as a lobby group in response to the Department of Transportation's proposed plans to cut off Amtrak train service in West Virginia. In the spring of 1979, Bonni McKeown organized 30 to 35 people to ride the train to Washington, D.C., and meet with Senator Robert Byrd on this issue of mass transit in West Virginia.

Having largely succeeded in their effort to save their transport line, the lobby wants to do all it can to promote the use of trains and other forms of mass transit. The organization, an informal network of 100 to 200 people, has a membership primarily of southern West Virginians of all races, ages, and incomes. The group feels that many people are unaware of the mass transit available, in large part because Amtrak scarcely promotes it.

Retain the Train is continuing its marketing effort for the trains and recruiting people to ride them. Limits to human energy and a lack of money have been the major impediments in the group's efforts.

Organization	Retain the Train
Address	Box 572 Charleston, WV 25322
Contact	Ms. Bonni McKeown (304) 342-5175
Telephone	Bob Palmer (304) 525-4424 Tod Hanger (304) 445-7365
Funded By	Membership Dues
Cost	n/a
Congressional District	II, III, IV
Compilation Date	February 1980



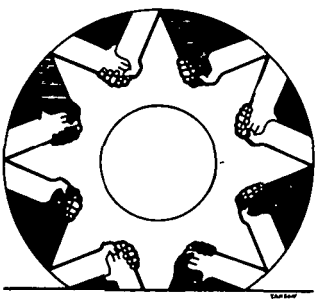
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	WV
Project Name	West Virginia Citizen Action Group (WV-CAG)

The West Virginia Citizen Action Group was formed in 1974 to advocate and defend the public interest of West Virginians. The WV-CAG has operated as a consumer, environmental, human rights, and energy action group as needs arise. The WV-CAG lobbies, tracks legislation, rates legislators according to their "public interest" voting records, publicly responds to organizational efforts not considered in the public interest, joins and supports various coalitions, testifies at hearings, petitions the government, sponsors programs, researches issues, and prepares reports to the public. The bi-monthly "CAG News" is published and sent to contributors and others.

The WV-CAG supports legislative measures that would establish an energy-conscious state building code, encourage the development of solar energy and other soft technologies, and encourage new uses of coal.

Organization	West Virginia Citizen Action Group
Address	1324 Virginia St., E. Charleston, WV 25301
Contact	David Grubb, Exec. Dir. Susan Kelley, Pres., Board of Directors
Telephone	(304) 346-5891
Funded By	Grassroots donations and fundraising
Cost	n/a
Congressional District	III
Compilation Date	February 1980



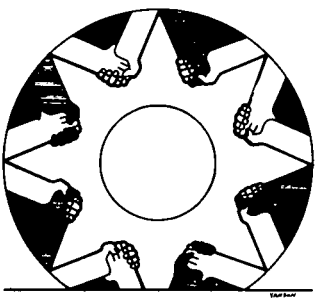
Renewable Resources— A National Catalog of Model Projects

Category	Outreach
State	WV
Project Name	West Virginia People's Energy Network (WV-PEN)

The West Virginia People's Energy Network is a citizens' group in the beginning stages. Currently, its primary function is to provide a means of communication among groups in West Virginia concerned with alternative energy and environmental issues.

The group was formed in the fall of 1979 at a renewable energy and energy-conservation conference called NOPEC--"New Options: People's Energy Conference." Conference participants voiced a need for communication and for staying informed about what other energy groups were doing in West Virginia. Consequently, a newsletter is being published bi-monthly by the WV-PEN. The first edition was distributed in January 1980 to 500 individuals and organizations. Circulation is expected to increase to four times that number. The newsletter is financed through donations and by commercial ads.

Organization	West Virginia People's Energy Network
Address	420 Elm St. c/o Mike Bannon, Morgantown WV 26505 Route 10 Box 248C, c/o Susan Santer Morgantown WV 26505
Contact	Mike Bannon, Carol Katoik, Susan Santer
Telephone	(304) 328-5143 (304) 292-2030
Funded By	Donations, commercial advertising space
Cost	n/a
Congressional District	II
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category State

State WV

Project Name Allegheny Recycling Project

The Randolph County Sheltered Workshop, a training center for mentally and physically handicapped adults, recently took over the Allegheny Recycling Project. A non-profit organization, the Workshop uses the money collected to meet its operating expenses.

The Recycling Project has been highly successful, collecting about three tons of glass per month. While employment training is not a project objective, workshop members participate in running the Alleghecy Project and tereby gain knowledge of the advantages of conservation.

Critique/analysis: Howard Goheen of the Sheltered Workshop said the primary difficulty has been getting "John Q. Public" involved. Goheen would appreciate any suggestions for involving average citizens.

Organization Randolph County Sheltered Workshop

Address P.O. Box 1458
Elkins, WV 26241

Contact Howard Goheen

Telephone (303) 636-1638

Funded By n/a

Cost n/a

Congressional District II

Compilation Date February 1980

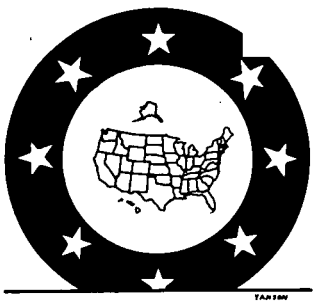
Renewable Resources—A National Catalog of Model Projects

Category	State
State	WV
Project Name	Energy Education Program
Organization	WV Fuel and Ener__ Office
Address	1262-1/2 Greenbriar St., Charleston, WV 25311
Contact	Jeff Herrholdt
Telephone	(800) 642-9012
Funded By	DOE
Cost	n/a
Congressional District	III
Compilation Date	February 1980

The West Virginia Fuel and Energy Office promotes energy conservation and alternative resources primarily through its Energy Education Program. Funded by DOE, the office disseminates free information and literature about energy and relevant government programs.

The Fuel and Energy Office maintains a toll-free telephone information hotline. It also distributes general consumer-oriented literature to interested individuals, schools, civic organizations, and business concerns, at conferences, fairs, and by mail.

Critique/analysis: Although the list of educational efforts is long, promotion of renewable energy is not a priority. In fact, little is said about renewable energy except in the group's "West Virginia Solar Energy Directory", which is only six pages long.



Renewable Resources—A National Catalog of Model Projects

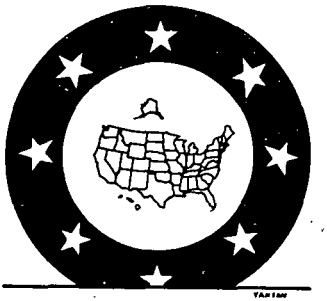
Category	State
State	WV
Project Name	School Conservation

To promote conservation through energy management, the West Virginia Department of Education has surveyed energy use in public schools. It has investigated the physical design of the school buildings, charted the historical energy-use patterns of each school, and conducted energy audits. Begun in late 1977, the survey and collection of data is nearly complete.

Within the counties, schools have been ranked according to their energy use (BTU/sq.ft.). Simple awareness of the energy costs within each school will make the program a success. Proper energy management in areas identified by the survey is expected to provide energy savings of 20 to 30 percent over the base year 1978.

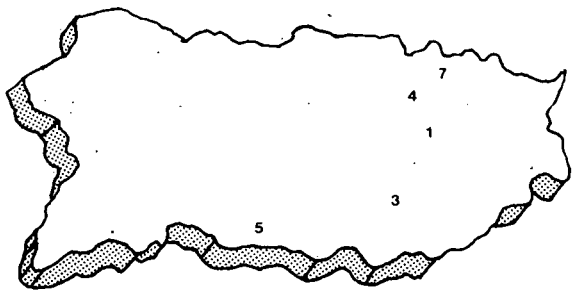
Organization	West Virginia Dept. of Education
Address	1900 Washington St. E. Building B-264 Charleston, WV 25305
Contact	Bernard H. Clark
Telephone	(304) 348-4187

Funded By	Dept. of Energy (DOE)
Cost	n/a
Congressional District	III
Compilation Date	February 1980



PUERTO RICO

1. Caguas
2. Caparra Heights Station
3. Cayey
4. Guayama
5. Ponce
6. Rio Piedras
7. San Juan
8. Santurce



PUERTO RICO

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Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
	Commonwealth of Puerto Rico
Project Name	Energy Hog Farm
Organization	Robert Paton
Address	Ponce, Puerto Rico
Contact	Robert Paton
Telephone	(809) 844-0191
Funded By	Private; Bank of America; Partial Government Guarantee
Cost	Approx. $500,000
Congressional District	I
Compilation Date	February 1980

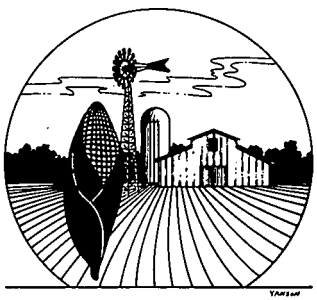
Robert Paton initially dreamed of a conventional hog farm that would use electricity from the local utility and dispose of its wastes in open oxidation pits. However, environmental regulations raised problems with the open pits, and the utility stated it would charge $12,000 to provide power lines to the farm, on top of an estimated yearly bill of $25,000.

So Paton opted for a vertically integrated swine facility with anaerobic digestion plants for the animal wastes.

A drainage system carries both excrement and urine to the digestors, which hold more than 700,000 gallons. The waste is processed into gas, which then goes to a methane holder and into four electric generators (two 65-KW units and two 30-KW units). With 1,100 hogs on the farm, the operation can generate the equivalent of $75 of electricity per day or $27,000 a year at current prices.

There are three additional benefits: First, potassium and phosphorus, a by-product of the process, can be used as fertilizer for oranges, mangoes, and avocadoes; second, the remaining liquid, rich in nutrients, can also be deposited in ponds to grow algae, which can be fed to the once it is dried; and last, water ning in the ponds can be used for irrigation.

The hog farm is a large-scale operation--reportedly the largest in Latin America and second largest in the U.S. About 25 persons were employed in its construction, and four persons run it.



Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
	Commonwealth of Puerto Rico
Project Name	Hog Farm Methane Production
Organization	Small Farmers Union of Carite (UPAC)
Address	P.O. Box 842 Barrio Carite Guayama, PR 00654
Contact	Jorge Gaskins
Telephone	(809) 765-4303
Funded By	Community Service Administration
Cost	$9,000
Congressional District	I
Compilation Date	February 1980

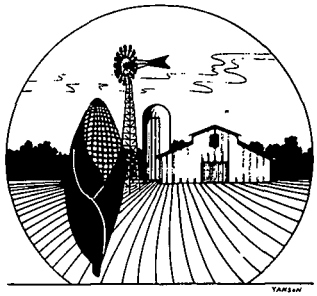
The Small Farmers Union of Carite (UPAC) is a communal farm project in the central mountains of Puerto Rico. The group is composed of about 100 member/workers from the Barrio Carite region in Guayama. It breeds rabbits and hogs, operates a handcrafts workshop, and cultivates ornamental plants and a fruit-seed bed. UPAC also has a farm services center, which provides the use of welding equipment, oxen for plowing and grinding limestone, and a store.

The hog-breeding operation involves about 135 female hogs that generate a significant amount of waste. Conscious of the proximity of nearby La Plata River, which is used for drinking water downstream, UPAC thought of disposing the waste by using bioconversion and methane gas-generation technologies.

The Puerto Rican Department of Agriculture turned down UPAC's appeal for aid because it had no evidence that such a process worked. The Department in turn suggested that the farmers use oxidation pits. Instead, UPAC proceeded in 1977 to construct a small prototype methane digestor with materials donated by the Commonwealth's utility, PRWRA, and by private individuals.

Using a design by a South African, John Fraye, UPAC built a mini digestor out of a 55-gallon drum. In the process it mastered the basics of the operation and were satisfied as to its viability.

With a CSA grant, UPAC then constructed two parallel digestors. The system is located so the waste flows down with gravity. The process is only between 65 and 70 percent efficient, in part because the farm is located in a cool valley.



While the methane gas generated by the digestors supplies no more than 10 percent the farmers' energy needs, it solves 100 cent of the environmental problem of waste disposal. This in effect was the primary objective of UPAC. Additionally, the effluent left over from the digestion process is applied on the vegetable crops of UPAC members. It improves the tilth of the soil, increasing the organic capacity of the topsoil, and thus enhancing root development and moisture retention.

Critique/analysis: To increase the system's capacity and efficiency will require money both for equipment and expertise. But currently there is not a lot of money to be made in small-scale hog breeding.

About 70 percent of the pork consumed in the island is imported from the United States. This meat tends to be cheaper. Conversely, animal feed is also imported, but is expensive. Thus, the market price for local pork is at times below UPAC's break-even point.

Renewable Resources—A National Catalog of Model Projects

Category	Agricultural
	Commonwealth of Puerto Rico
Project Name	Solar Livestock/ Feed Dryer

Organization	The Small Farmers Union of Carite (UPAC)
Address	P.O. Box 842 Barrio Carite Guayama, PR 00654
Contact	Jorge Gaskins
Telephone	(809) 765-4303

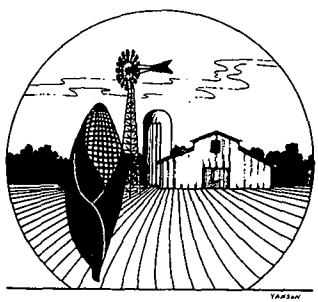
Funded By	US-DOE--Appropriate Technology Small Grants Program
Cost	$25,000
Congressional District	I
Compilation Date	February 1980

Since 1977, The Small Farmers Union of Carite (UPAC), has been experimenting with various types of locally available organic matter to substitute for imported animal feed. The goal of UPAC's Solar Drying Project is to reduce the dependence on imported animal feed by devising a system that better utilizes the available resources, thereby increasing self-sufficiency. As long as it has to depend on imported feedstock it will not be able to compete. At present UPAC imports 80 percent of its animal feed at a cost of approximately $40,000 annually.

In its experiments, UPAC has had great success with the plant Comfrey, which contains at least 20 percent protein in dry matter. It is the only land plant containing Vitamin B12, and it contains many other nutrients. The problem with Comfrey is its high water content, which hogs cannot consume. The plant must be dried, which can be expensive with conventional drying methods. With the funding from DOE, UPAC will now devise two prototype solar driers: a small one to be used by individual farmers to dry Comfrey for their own animals, and a large model for use by cooperatives.

The concept involves a Solar Drying Patio, where seeds and skins are dried, then mixed with molasses and fed to the hogs. Seeds will be fed to poultry. Any surplus can be sold as cow feed.

Other plants also are being tested, including Okra leaves and seeds (Quimbombo), Breadfruit (Panapen), and the byproducts from the processing of Passion fruit (Parcha).



Renewable Resources—A National Catalog of Model Projects

Category	Community
	Commonwealth of Puerto Rico
Project Name	Enersol Project

Organization	COTACO (Workers Committee to Help the Consumer Inc.)
Address	P.O. Box 10646 Caparra Heights Sta. Puerto Rico 00922
Contact	Angel Domenech
Telephone	(809) 782-0647

Funded By ; ;	PR CAA PR ENERGY OFFICE CSA
Cost	$60,000 - $70,000
Congressional District	I
Compilation Date	February 1980

The Workers Committee to Help the Consumer, Inc. (COTACO) is a consumer organization launched a few years ago by the International Ladies Garment Workers Union in coalition with other groups. While not restricted to energy issues, COTACO's Enersol Project is a major component of the organization.

Enersol started in October of 1977 and has continually expanded since then. It comprises three main objectives: to provide hot water via solar energy to poor families who cannot afford electric water heating; to provide consumers with a means for cutting their energy bill; and to provide the basis for a solar manufacturing industry that would employ low-income people.

With an initial grant of $25,000 from the Community Action Agency of Puerto Rico, COTACO started an energy-conservation and resource-development program to train low-income persons to construct and install solar water heaters in their homes. To do this, COTACO organized five regional demonstration conferences to foster an understanding of energy-conservation practices and to demonstrate how to construct and install a solar water heater. An estimated 500 low-income persons participated in each of these activities.

As a spin-off of the regional conferences, neighborhood workshops were conducted at the homes of selected families. About 25 neighborhood families participated in each group workshop, during which three solar water heaters were constructed. Other workshops were held for the Department of Consumer Affairs, the Administration of Education Department, the Office of Economic Opportunity, and the Sun Day Committee (Energia Verde).

COTACO also produced and placed a 10-minute energy documentary and a 30-second spot on all television stations in Puerto Rico. The footage was also shown at numerous community meetings. A 30-second radio spot was placed on 38 radio stations, and 50,000 pamphlets on ways to conserve energy were distributed.

The initial impact of the project was encouraging. Over 1,500 persons requested the pamphlet, and at least 35 solar units are installed and working efficiently.

In June of 1978, an $8,000 grant from the Energy Office enabled COTACO to conduct five additional conferences and 65 workshops throughout the island in December of that year. During the second round of conferences, funds for building materials were provided by attendees at the workshops.

Currently, COTACO is expanding the Enersol project on all fronts. With a $30,000 grant from the Community Services Administration it is developing a plan to utilize the skills acquired in the Enersol program to form community corporations of low-income families who will construct and install solar water heaters at specified prices.

COTACO is also taking Enersol to public high schools. With $5,000 from CETA, the schools will conduct 17 educational workshops involving 36 low-income students from the Guayama Region. It is hoped that some of these students will continue their involvement in the emerging solar field.

COTACO is also beginning to sell its solar construction workshop to specific groups, such as the workers at the Bacardi Rum plant. For $1,300 COTACO will present a 3-day workshop, during which three solar units will be produced. (Materials are included in the fee.)

Recently COTACO was awarded funds
r the Department of Energy's (DOE) Ap-
riate Technology Small Grants program.
' will be used to supplement the afore-
mentioned plan.

Critique/analysis: A better example than COTACO's of efficient use of government funds would be hard to find.

COTACO's choice of a solar project is dictated by the very serious energy problems of Puerto Rico. Electricity supplies a much higher percentage of energy in Puerto Rico than it does in the continental United States. Coupled with a 99.9 percent (.1 percent hydro) dependence on OPEC oil as the source of energy, the impact of increased oil prices has been greater here. Not only have gasoline and electricity costs more than doubled since 1973, but so have the prices of bottled gas and kerosene, products used primarily by 85 percent of poor families for cooking in Puerto Rico.

For COTACO the Enersol program can only help under these circumstances, particularly with regard to generating some employment opportunities. But there are also more subtle benefits: improvements in the standard of living of low-income people, and participation in an important citizen initiative.

Renewable Resources— A National Catalog of Model Projects

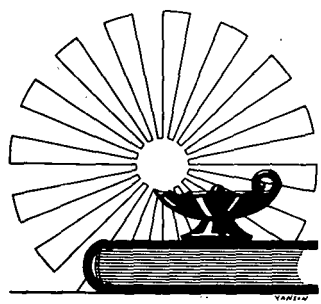
Category	Education
Project Name	Audio-visual Energy Shows
Organization	Colegio Universitario del Turabo (CUT)
Address	Box 1091 Caguas Puerto Rico 00625
Contact	Mildred Huertas
Telephone	(809) 743-3797 Ext. 263
Funded By	Cost Sharing: DOE - 63 percent CUT - 37 percent
Cost	$16,000 (Proposal)
Congressional District	I
Compilation Date	February 1980

Colegio Universitario del Turabo (CUT) is a private, non-profit four-year college serving a community of 12 municipalities in the Gurabo-Caguas (Central Island) area. As of 1975, the region had a total population of 420,000. The people are overwhelmingly rural and poor. During 1975, the per capita income in the area was below $2,130, the per capita average for Commonwealth.

CUT proposes to design and produce two audiovisual shows on "Biomass and Bioconversion" and "Solar-Thermal Conversion" to serve as demonstrations of conservation of fossil fuels and solar energy. The modules will be prepared with the layman in mind. They will consist of slide demonstrations supplemented by audio and a written text, the latter of which the audience can take home for future reference. Demonstrations will be presented in high schools and to civic, commercial, and government groups. The program will specifically address how biomass , conservation , and solar energy technologies are applicable to Puerto Rico's needs.

Critique/analysis: The project will help bridge the communication and knowledge gap between the private and academic sectors, and will serve as a vehicle for strengthening CUT's energy/environment (and its associate Degree in Solar Technology). Additionally, the project will help develop community awareness and experience.

Presently, energy-related audiovisual materials relevant to Puerto Rico's



particular socioeconomic and energy needs
: scarce. Flexible modules that can be
lated at minimum cost and presented in
Spanish are needed. The CUT approach
tries to encourage local modification,
thus giving the educators the freedom to
alter their presentation, taking individual
differences of the target population into
account.

Renewable Resources— A National Catalog of Model Projects

Category	Education
	Commonwealth of Puerto Rico
Project Name	Center for Energy and Environmental Research
Organization	UPR - Center for Energy and Environmental Research
Address	Caparra Heights Station San Juan, PR 00935
Contact	Dr. Juan A. Bonnet, Jr.
Telephone	(809) 765-7210
Funded By	USDOE - Commonwealth of Puerto Rico
Cost	$3.5 million
Congressional District	I
Compilation Date	February 1980

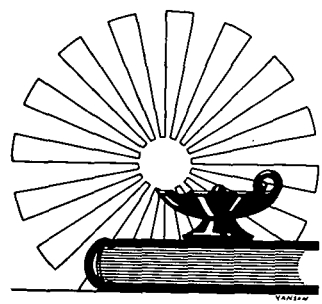
In 1957, the Atomic Energy Commission (now the Nuclear Regulatory Commission) established the Puerto Rico Nuclear Center (PRNC). Until 1975, the Center served as training and research center in all phases of nuclear science, engineering and medicine for scientists and students from the Caribbean, Latin America, Europe, Africa and Asia, as well as from the U.S. mainland.

With the demise of the Atomic Energy Commission and the shift away from intensive use of atomic power as an energy source, the facilities were transferred to DOE, and the Center for Energy and Environmental Research was established.

The Center, part of the vast University of Puerto Rico, works with other universities and with government agencies in its research on alternative energy, renewable resources, and environmental conservation. The organization is currently conducting studies in solar energy, photovoltaics, biomass, wind, ocean thermal, bioconversion, and co-generation. The Center also sponsors activities relating to waste recycling, conservation, and compost-production research.

Specific CEER projects include the development and installation of concentrating solar collectors for steam production at the Bacardi Rum Company in Puerto Rico.

The Center is also involved in a number of small-scale biogas production studies. One involves the processing of rum wastes (residues from the fermentation of sugar cane). The wastes have become a dangerous pollutant of coastal sea waters. Processing the wastes will both reduce pollution and provide large quantities of inexpensive biogas.



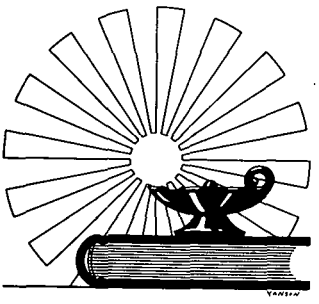
Critique/analysis: The Center is a leader
Puerto Rico's research efforts in alterna-
energy, particularly renewable
sources, and environmental improvement.
Additionally, because of Puerto Rico's
proximity to South and Central America,
the Center serves as a focal point for
applying appropriate energy solutions de-
veloped in industrialized societies to the
technological needs of the developing world.

Renewable Resources—A National Catalog of Model Projects

Category	Education
	Commonwealth of Puerto Rico
Project Name	Energy Conservation Technician Traini
Organization	Bayamon Technological University College
Address	Box 4296 Bayamon Puerto Rico 00619
Contact	Alfred Crouch
Telephone	(809) 786-6840
Funded By	Puerto Rico Office of Energy
Cost	$63,000
Congressional District	I
Compilation Date	February 1980

The Bayamon University College, a four-year institution in the University of Puerto Rico system, offers an experimental associate degree program called "Energy Conservation Technician Education Program". The main objective of the program is to train energy-conservation technicians, preparing them for careers in the community, government, business and industrial sectors.

The program was designed to match the needs of the Office of Energy with the capabilities of the Regional Colleges System, of which Bayamon University College is part. The first year of the program stresses basic science and mathematics; the second year stresses various energy-conservation applications. Courses on energy conversion, energy management, energy economics, energy production, and solar energy technology are part of the program.



Renewable Resources—A National Catalog of Model Projects

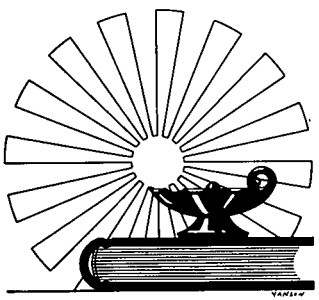
Category	Education
	Commonwealth of Puerto Rico
Project Name	Energy Curriculum

The University of Puerto Rico's Rio Piedras campus offers the course, "Energy Production, Its Technology and the Environment". The description of the course reads as follows: "An industrial society requires not only a large supply of energy, but also a high use of energy per capita. The society's economy and standard of living are shaped by interrelations among resources, population, conversion processes, the particular applications of power, and the nature of the changes included in the environment. The study of these relationships calls for a multi-disciplinary course with the following contents: study of the physics of energy production, existing and possible new technologies and their economic and environmental implications."

It is noteworthy that this course has been adopted to the "Energy Conservation Technician Education Program" offered by the Bayamon University College.

Organization	University of Puerto Rico, Rio Piedras
Address	Ponce de Leon Avenue Rio Piedras, P.R. 00931
Contact	Dr. Manuel Gomez Dean, Faculty of Natural Sciences
Telephone	(809) 764-0000

Funded By	UPR, Rfo Piedras
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources—A National Catalog of Model Projects

Category	Education
	Commonwealth of Puerto Rico
Project Name	"Energy: Today and Tomorrow"

"Energy: Today and Tomorrow" is a mobile educational unit that informs high school students about current sources of energy, the methods utilized to generate energy, possible future sources, and the social, economic, and environmental implications of each source. Energy conservation is also explained.

The purpose of the project is to promote understanding of the energy crisis and the impact of scientific knowledge and technology in modern life.

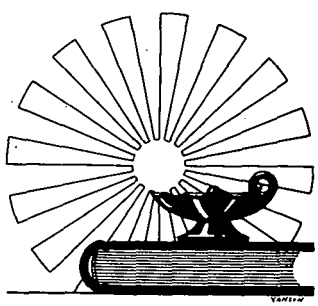
The unit visits one public high school every day. Following an introductory session, classroom workshops are organized according to interest, level and number of students. Among the props used in the presentation are a garbage bucket (which exemplifies the recyclable character of solid wastes), a bicycle that generates electricity for a television set, a fan, an electrostatic precipitator to control pollution, and an electric motorcycle.

The unit (one of 30 in the U.S.) was developed by the OAK Ridge Associated Universities (ORAU) of which U.P.R. is a part. ORAU is in charge of US DOE National Exhibitions Program. The local program will cover the San Juan, Humacao, and Caguas Regions.

Critique/analysis: One drawback of the project is the occasional irrelevancy of the material with regards to Puerto Rico's drastically different situation. It is important for Puerto Ricans to develop their own material instead of importing it and translating it.

Organization	UPR - OAK Ridge Associated Universities
Address	P.O. Box 21850 U P R Station Rio Piedras, PR 00931
Contact	Conchita Rodriguez Anillaga
Telephone	(809) 763-1600 Ext. 27 and 28

Funded By	Various Government Entities
Cost	n/a
Congressional District	I
Compilation Date	February 1980



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Category	Education
	Commonwealth of Puerto Rico
Project Name	High School Energy Workshop

Sixty tenth-grade students of low-income background have participated in a comprehensive workshop in energy and alternative sources. They are learning about energy in nature and energy in society; about the local energy crisis and the need for conservation and alternative local energy sources such as the sun, the wind, the ocean, biomass, and nuclear power.

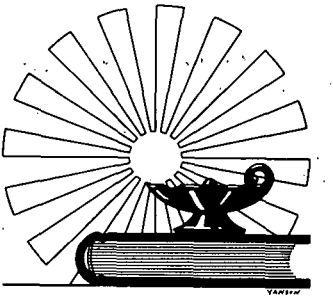
The project, which began in the Summer of 1979, involves six weeks of intensive studies in Science, Math, Spanish and English. These studies are supplemented with energy-related conferences, films, panel discussions and visits to energy research sites. Participants also receive counseling on their abilities, potential, and limitations, as well as their college career, financial aid opportunities, and studying habits.

During the school year, following the summer training, the students will meet on Saturdays. In sumer of 1980 they will undergo another intensive training period which will be followed up throughout their last year in high school. They are learning about energy in nature and energy in society; about the local energy crisis and the need for conservation and alternative local energy sources such as the sun, the wind, the ocean, biomass, and lear power.

Critique/analysis: One student had this to say: "We have observed how practically all the people working with alternate sources of energy are North Americans or foreigners. I think we can prepare ourselves so that in the future, those positions will be occupied by us and other Puerto Ricans. We have the talent; all we have to do is develop it."

Organization	Center for Energy and Environmental Research UPR(CEER)
Address	Caparra Heights Station San Juan, PR 00935
Contact	Prof. Agnes Betancourt de Werner
Telephone	(612) 767-0358

Funded By	U.S. DOE
Cost	$214,000
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Education
	Commonwealth of Puerto Rico
Project Name	Solar Curricula

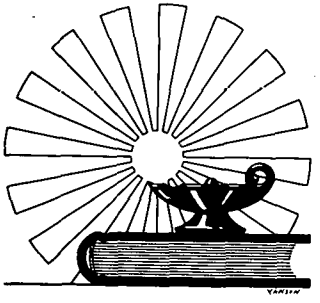
Cayey University College, a four-year institution in the University of Puerto Rico system, offers two solar-related energy courses in the Department of Science and Physics.

The first course, "Introduction to Energy", surveys for prospective and active teachers energy topics covered by the Department of Public Instruction in its science courses. The course includes a discussion of alternate and renewable energy sources, and energy conservation.

The second course, "Topics on Energy", is still at a planning stage. Aimed at science students, the course's topics will include a discussion of alternate energy sources and energy conservation, and an in-depth study of solar system components, photovoltaics, domestic hot water solar applications, wind-power systems and solar energy policy development.

Organization	Cayey University College
Address	Ave. Antonio R. Barcelo Cayey, PR 00633
Contact	Dr. Cesar Cordero Department of Mathematics and Physics
Telephone	(809) 738-2161

Funded By	Cayey University College
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Industrial
	Commonwealth of Puerto Rico
Project Name	Solar-cooled Manufacturing Plant
Organization	Industrial Development Corporation (Fomento)
Address	G.P.O. Box 2350 San Juan, Puerto Rico, 00936
Contact	Louis Rodriguez, Felipe M. Lara
Telephone	(809) 764-1275, ext. 511
Funded By	US-DOE/Commonwealth
Cost	$547,000 (Investment)
Congressional District	I
Compilation Date	February 1980

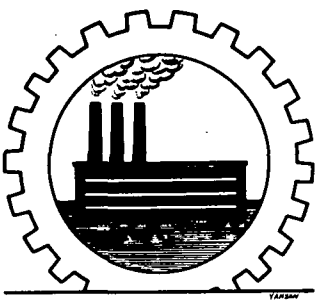
Fomento decided to design, build, operate, and monitor a cost-effective solar energy cooling system within a standard "Fomento" factory. (Increases in electricity costs for meeting the cooling needs of manufacturing was an incentive to explore solar energy's potential.)

The project will service a 10,800 ft^2 production area, which will be used for electronic equipment manufacturing - a type of industry that Fomento hopes to attract to Puerto Rico. Now in its final development stages, the system consists of 522 solar collector modules covering a 7,000 ft^2 roof-deck area. Drainable evacuated tubes with parabolic reflectors will be used.

The system is expected to meet 80 percent of the factory's air-conditioning requirements. Additionally, it will supply hot water to the laboratories in the toilet/locker area.

The expected electric energy saving is estimated at 135,600 KW per year, or about $10,000 at current industrial rates. However, the initial cost of a conventional cooling system is $157,000, compared with $547,000 for the solar system.

tique: With an expected life cycle of 20 rs, a 15 percent annual increase in ctricity costs, maintenance considerations and only 8 percent interest rate, the break even point will be 21 years - hardly cost effective, particularly with the current interest rate (12 percent). Yet substantial cost decreases are expected in the evacuated tube collector industry. A cost reduction from the projected one of $21.45/$ft^2$ to $15/$ft^2$ would reduce the system pay-back period to 12 years. While that is good news, it appears it won't be enough



to attract private investment. It seems clear that government incentives are what is needed to make industrial solar cooling a reality in Puerto Rico.

Renewable Resources—A National Catalog of Model Projects

Category	Institutional
	Commonwealth of Puerto Rico
Project Name	Solar Post Office

The United States Postal Service (USPS) has installed a solar air conditioning system on its new Guayama Branch in south-central Puerto Rico. The system, powered by 199 flat-plate collectors, is one of seven USPS currently operates or plans to install in its facilities.

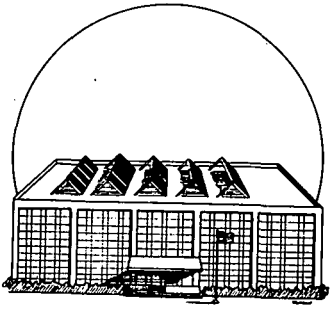
To prevent hurricane damage, the collectors are firmly fastened to the insulated and steeply pitched roof of the 6,600 ft 2 building. Heat generated in the system is fed to an absorbtion chiller unit to cool the building, which was constructed on the summit overlooking the community of Guayama.

USPS contracted the design, consulting, and construction to local firms. It is now training its personnel how to operate and maintain the system, said by one source to be the first solar air conditioning application for a large Puerto Rican structure. The station was designed in October of 1978, and is scheduled to go into operation in spring of 1980.

The USPS has constructed two Post Offices —one in Boulder, Colorado, and one in Houston, Texas--that incorporate active solar systems. Solar Post Offices in Ridley Park, Pennsylvania and Aspen, Colorado, are also nearing completion. In addition, the USPS has ›d a 100-percent solar-heated building ı station in Powers, Michigan. The solar building was the low bidder for the contract.

But the organization's bright star may be a passive solar design facility planned for Parker, Colorado. According to one USPS official, the Parker station (now the subject of a feasibility study) would probably be the first solar application promoted by the Post Office that would prove itself economically sound.

Organization	United States Postal Service
Address	Guayama Branch, Puerto Rico
Contact	Galó Melendez
Telephone	(202) 245-4300
Funded By	USPS
Cost	n/a
Congressional District	I
Compilation Date	February 1980



Renewable Resources— A National Catalog of Model Projects

Category	Legislation
	Commonwealth of Puerto Rico
Project Name	Solar Laws

Organization	Commonwealth of Puerto Rico
Address	n/a
Contact	n/a
Telephone	(809) 724-2030

Funded By	n/a
Cost	n/a
Congressional District	I
Compilation Date	February 1980

In 1979, the Commonwealth of Puerto Rico's Legislature enacted its first five laws to promote conservation and solar energy.

Law 133 orders the Energy Office to establish specifications regarding minimum efficiency requirements for solar equipment and for components sold or manufactured commercially in Puerto Rico.

Law 185 provides a special income tax deduction of 30 percent (up to $500) for expenses incurred by any individual who acquires or installs a solar water heater in his/her principal place of residence. (It is not clear whether the law benefits those who build their own equipment.)

Law 3 provides a special income tax deduction of 40 percent (up to $3,500) for expenses incurred by any individual, proprietorship, or corporation that acquires or installs a solar water heater in his/her place of business. Deductions are limited to one per individual.

Law 4 provides for a property exemption tax on all equipment that uses solar energy. The exemption holds for five tax years after date of installation.

Law 8 provides an exemption from the Commonwealth's 5 percent excise tax on all equipment, parts, and accessories that use solar energy, all equipment that involves the re-utilization of energy (co-generation), all windmills used to produce electricity.

Two conservation laws were passed by the Commonwealth Legislature in 1979.

Law 69 of June 8, 1979, orders the General Services Administration of the Commonwealth, Public Corporation and

Municipalities to take into account the energy efficiency of equipment purchased any other applicable activity. Central this measure is the use of life cycle cost determinations and adherance to energy-efficiency norms established by the Energy Office.

"Life cycle costing" involves taking into account the purchase price in combination with the expected energy and maintenance cost it will incur during its life time of normal use. Main factors are the increasing cost of conventional energy and the rise of interest rates.

Law 90 of July 12, 1979, authorizes the Energy Office to establish lighting efficiency standards for the illumination of public buildings in Puerto Rico.

Critique/analysis: Solar legislation has gotten a late start, and many of these five laws require the Governor's intervention to pass. Much remains to be done in view of the broad potential solar energy has in Puerto Rico for decreasing dependence on foreign resources and for aiding local industry.

Renewable Resources—A National Catalog of Model Projects

Category	Utility
	Commonwealth of Puerto Rico
Project Name	The Culebra Windmill

Organization	PR Water Resources Authority (PRWRA) Environmental Protection Division
Address	P.O. Box 4267 San Juan, PR 00936
Contact	Fernando Perez Bracetti
Telephone	(809) 723-0055

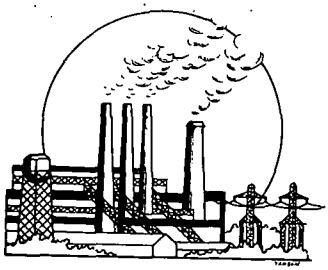
The little island of Culebra off Puerto Rico's east coast was selected by DOE as the site for its third large-scale wind project. The windmill in Culebra has two blades with a 125' diameter. It was designed to operate in winds between 8 and 40 mph, and can provide as much as 20 percent of Culebra's electricity needs (or 100 percent of its needs on Sundays).

Unfortunately, the Culebra windmill encountered problems from the beginning and had to be dismantled 11 months after its inauguration in July of 1978. (It had operated a total of 24 days). The main cause for halting operation was the deterioration of the aluminum covering on the blades despite their 30 year expected lifetime.

Electricity generated by the windmill was fed into PRWRA's grid. For those periods the windmill did work, electricity costs for Culebra residents were reportedly the same. The windmill is expected to be returned to operation once its faults are corrected.

Funded By	US-DOE/PRWRA
Cost	Approx. $1,200,000
Congressional District	I
Compilation Date	February 1980

Critique/analysis: It could not be determined if the Culebra residents would benefit in decreased cost per kilowatt as a result of the project. Given the price of the system, the pay-back period will be lengthy.



Renewable Resources—A National Catalog of Model Projects

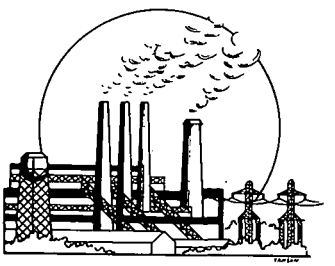
Category	Utility
	Commonwealth of Puerto Rico
Project Name	Low-Head Hydro Project
Organization	Puerto Rico Water Resources Authority
Address	Environmental Protection Division Condado Street, Stop 18 Santurce, PR 00907
Contact	Mr. Fernando Perez Bracetti
Telephone	(809) 725-8156
Funded By	PRWRA-financed
Cost	$500,000 (initial stage)
Congressional District	I
Compilation Date	February 1980

In 1910 a full 99 percent of Puerto Rico's electricity was generated by hydroelectric plants. Today, less than .5 percent is supplied by that source. But this at least explains how a power-producing authority came to be called the Water Resources Authority. W.R.A. is now 99 percent dependent on the Oil-Producing Export Countries (OPEC) for fuel to produce electricity.

In the past, cheap oil made hydro uneconomic or not worth maintaining. But the skyrocketing price of oil is beginning to reverse that trend. Hydro power, particularly small low-head dams, is becoming competitive with other forms of generating electricity. Thus, PRWRA is building one 600 to 800 KW hydro plant in Patillas, Lago. Patillas is a man-made lake built for irrigation purposes. It will be capable of supplying power to a community of about 100 families.

PRWRA is looking into the possibility of building more low-head plants that take less than a year to build. They also plan to restore old hydro plants, and to assess the feasability of using conventional higher-output units.

Critique/analysis: Estimates are that hydro
d satisfy about .5 percent of electricity
nd, but it could not be determined whether that estimate takes into account the effect of extensive conservation efforts.



Renewable Resources—A National Catalog of Model Projects

Category	Utility
	Commonwealth of Puerto Rico
Project Name	Oceanthermal Electricity Conversion
Organization	Water Resources Authority (AFF)
Address	Environmental Protection Division Condado St. Stop 18 Santurce, PR 00907
Contact	Mr. Bracetti
Telephone	(809) 723-0055
Funded By	DOE
Cost	Apprx. $200-$250 million (40MW plant)
Congressional District	I
Compilation Date	February 1980

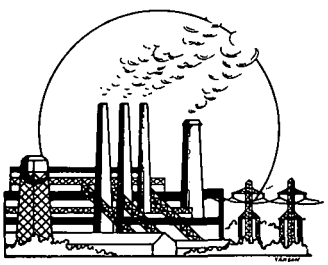
The Water Resources Authority (AFF) is the sole producer of electricity in Puerto Rico. Its electric generating capacity is approximately 4000 MW. AFF is competing with Hawaii, among others, for the next phase of DOE'S Oceanthermal Electricity Conversion (OTEC) program. The technology, based on the concepts formulated in 1881 by Jaques d. Arsonval of France, is applicable only in regions with relatively deep ocean depths close to shore.

The OTEC concept has been proven on a very small-scale level (10-KW) in Hawaii. Subsequent projects will test its large-scale feasibility. In the 1980s, DOE will fund demonstration projects in the 10-100 MW scale. Later projects in the 100-400 MW range will be conducted.

The OTEC technology generates power by taking advantage of the temperature differences between warm ocean surface water and cold subsurface water pumped through an almost totally submerged seven-story pipe. The warm water vaporizes a volatile working fluid, like ammonia, which in turn drives a turbo generator before being condensed by cold water pumped up from as much as 4000 feet below.

In a 1-MW system, more than 13 million gallons of water will pass through the evaporators and condensors each minute. Massive pumps, powered by OTEC's own electricity, will move the water through the system.

The system can also produce hydrogen (a potential commercial fuel) and ammonia (which is widely used in chemical processes). Scientists are also investigating using the nutrient-rich cold water brought from the depths of the ocean for a mariculture program.



Critique/analysis: Several fundamental problems must be overcome, however, before system is cost-effective. Scientists find a metal that can tolerate salt water for the system's estimated 30-year lifetime. Those metals that now meet the requirements are very costly, inflating the capital cost per KWH at $2,000 (compared with $800-$1,200 per KWH for gas- and oil-fired plants). Current cost estimates for a 10-MW plant are $30-$60 million. Operating costs are estimated at $18 million annually.

The system would have a low energy efficiency. Over 95 percent of the energy produced is re-used in the process.

Maintenance is likely to pose problems too, since the algae and other sea organisms clog the machinery. Cleaning the system may involve using chlorine or a mechanical "scrubbing" device.

The argument in favor of this high-cost technology is that the system will not use conventional fuels, the cost of which will increase annually into the next century. Thus, it is reasoned that the OTEC plant life-cycle cost will be lower than conventional plants.

The main uncertainty to be resolved, according to the Energy Office, is with respect to the detrimental environmental impact of moving nutrients, reducing surface water temperatures, and possibly discharging ammonia into the ocean.

*U.S. GOVERNMENT PRINTING OFFICE : 1980 0-311-119/143