CITY OF CHICAGO - DEPARTMENT OF ENVIRONMENT

URBAN CONSORTIUM ENERGY TASK FORCE

PROJECT SUMMARIES/ABSTRACTS

U.S. DEPARTMENT OF ENERGY

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SUMMARY STATEMENT OF WORK FOR CITIES/COUNTIES PROJECTS
Tasks 1-23

SUSTAINABLE URBAN ENERGY MANAGEMENT

Task #1 Denver Smart Places: Stapleton Development (Denver, CO)

This is a continuation project from FY1995. The objective of this project is to put together an information resource guide for the Stapleton Development. This project's achievements will become part of the zoning, environmental regulations and incentive programs for the property. Objectives are to reduce the regulatory burden on new and expanding businesses and to reduce their startup, operation and maintenance costs to assure profitability.

Task #2 Solar Powered LED Applications in Cold (Hennepin County, MN)
Weather Climates

This project will test potential applications for solar power and light emitting diode (LED) lamps in red flashing traffic lights. These test results will identify potential use of LED lamps and solar powered generation on other signs and signals throughout the County. The project will identify the energy efficiency and cost savings resulting from a switch from regular lights to LED lamps. The study will also identify differences in maintenance required for the two types of flashers. It will also identify the feasibility of using solar power for lighting applications.

Task #3 Refrigerant Recycling Management Plan (Houston, TX)

This project will evaluate methods to obtain refrigerant inventories, schedule HVAC equipment replacement, maintain HVAC equipment (stationary and mobile), and manage refrigerants in order to formulate a workable strategic refrigerant recycling management plan and use the savings to minimize refrigerant cost. This will require extensive analysis of the methodologies developed for replacing HVAC equipment and develop new methodologies for vehicular equipment as well as analyzing maintenance procedures for both. Focus will be on commercial and office buildings and other municipal facilities such as libraries, fire and police stations, parks and recreation centers as well as refrigerant recycling in motor vehicle air conditioning.

Task #4 Energy Efficiency Technology Partnership (Memphis, TN)

It is difficult for public sector programs to effectively provide energy efficiency services to a large, diverse commercial sector. This project works toward a sustainable urban energy system by "getting technologies off the shelf, out of the laboratory, and into buildings", by developing partnership between several government agencies and local contractors. This project's strategy focuses on encouraging HVAC, mechanical and electrical contractors to provide energy efficiency technology and services to commercial customers; and, developing the capacity of contractors to help their commercial customers make energy efficient technology choices.

Task #5 Affordable Super-Insulated Straw Bale (Tucson, AZ)
Model Homes

The straw bale wall system is an inexpensive way to super insulate the walls of homes (R-55). This method has been used successfully for a long time. It is a building technology that offers a wide array of advantages with few drawbacks. It uses an annually renewable, readily obtainable agricultural waste product to build the

only truly affordable, super-insulated wall system available today. The City of Tucson and Pima County anticipate adopting the first prescriptive building code in the country for straw bale construction as an appendix to the 1994 Uniform Building Code. This inclusion in the Code will make this construction type more acceptable to the financing and insurance community. Two demonstration straw bale buildings will be constructed: one will be an affordable single family residence, purchased by a qualified low-income buyer, the second will also be a residential but open to the public for education and information purposes and can also serve as a community center. Both buildings will be monitored for energy usage over a period of a year.

TECHNOLOGY TRANSFER

- Task #6 Urban Energy Empowerment Consortium (Lansing, MI)**
- This project seeks to bring together an Urban Energy Empowerment Consortium consisting of members of the public and private industry to create a synergy among Citizens, Businesses, Government, Education Institutions, Energy Engineers, Financial Institutions and Developers for the revitalization of the City of Lansing.
- Task #7 Establishing a Revolving Energy Fund for (Phoenix, AZ)**
Efficiency Improvements in Local Governments
- The objective of this project is to highlight the process used by the City of Phoenix in establishing the energy conservation savings reinvestment plan, the valuable lessons learned over the years, and the new direction of the program.
- Task #8 Energy Efficiency Demonstration, Evaluation (Cedar Rapids, IA)**
and Training Module
- The objective of this project is to create a functional, hands-on energy efficiency demonstration, evaluation and training module in the historic City Hall facility. The creation of a functional energy efficiency module will provide the ideal environment for training sessions, in order to provide technology assessment and training for other city department facilities personnel, and facilities personnel from other city, county, other local governmental agencies including area school systems, and private sector businesses within the region.
- Task #9 Alternative Fuel Vehicle Show and Fleet (Portland, OR)**
Managers Conference
- This project's objective is to create an AFV "sideshow" at the annual Portland Auto Show to present actual AFVs and afv products to Fleet Managers and others. Most fleet managers only have concepts of alternate fuel vehicles. This will be an actual hands-on presentation.
- Task #10 Sustainable Municipal Buildings Pilot Project (San Francisco, CA)**
- This project aims at transferring the City of Austin's sustainable municipal buildings program, particularly, the methodology and major concepts of the Sustainable Building Guidelines, to a San Francisco municipal building. This project will produce plans and specifications for a "green" City building; it will provide guidelines for City architects and engineers to more easily incorporate these elements into future projects; it will develop and strengthen an institutional vehicle for inter-departmental cooperation on sustainability issues; and, it will provide the City's Commission on the Environment with a case study to draw on in formulating sustainable policy recommendations to the Board of Supervisors.

- Task #11** **Solar Assisted Air Conditioning and Dehumidification System Applications** (Cuba Rojo/Maya Guez, PR)

Solar assisted air conditioning systems have been proven to be economically feasible elsewhere for dry climates. However, high latent loads are commonly present in the Caribbean. The University of Puerto Rico has engaged in a long term effort to determine the feasibility of solar-assisted air conditioning and dehumidification system in Puerto Rico and the Caribbean. Results from this research program will pave the way for further commercialization of the technology. The full research consists of three major phases; preliminary technology assessment; development of design tools, and testing of a pilot system. This research project will investigate the necessary design parameters for the operation of a pilot solar-assisted air conditioning and dehumidification system in Puerto Rico.

- Task #12** **Evaluating Telecommuting as a Management Tool** (Seattle, WA)

The purpose of this project is to demonstrate the effectiveness of telecommuting as a management tool and to develop an incentive and rationale which encourages the use of telecommuting as an alternative to the use of single-occupant vehicles for commuting, thereby reducing congestion and vehicle miles traveled which contribute to deteriorating air quality.

TRANSPORTATION - ALTERNATIVE VEHICLE FUELS

- Task #13** **Hydrogen Fuel Cell Technology Validation Program for Urban Bus Application** (Chicago, IL)

This is a three-year project to further the commercial development and demonstrate the use of five (5) 40-foot transit buses powered by Proton Exchange Membrane (PEM) fuel cells. Fuel cells combine hydrogen and oxygen to form pure water. An intermediate step in this reaction produces electrons which constitute electric current and can run an on-board electric motor to propel the bus. This is a truly "zero-emission" power source. PEM-powered buses also do not need to carry caustic or dangerous substances such as methanol or phosphoric acid.

- Task #14** **E-85 Refueling Infrastructure** (Des Moines and Polk County, IA)
(for Indianapolis, IN; Des Moines, IA in
conjunction with Polk County, and Hennepin County, MN)

This is a coordinated effort of several partners in developing a refueling infrastructure for E-85 fleet vehicles in Des Moines (in conjunction with Polk County, IA), Indianapolis, IN and Hennepin County, MN. These three commercial E-85 refueling facilities will form an important part of the E-85 Initiative developed by the Governors' Ethanol Coalition and the National Corn Growers Association. This project will promote the purchase of E-85 vehicles by helping to establish the necessary commercial E-85 refueling infrastructure.

- Task #15** **The Atlanta Olympic Report: A Study of Alternative vs. Conventional Fuel Use in a High-Traffic Environment During the 1996 Olympics.** (Atlanta, GA)

Atlanta is a non-attainment city required to comply with the Clean Air Act Amendments. The 1996 Olympics will provide an optimum environment to analyze the economics and efficiency of a broad selection of alternative fuels when used in high-volume, high traffic applications. The participants in this study will either

provide or gather data to be compiled on vehicles fueled in CNG, Propane, Methanol, Electricity, and Conventional fuels. The result will provide a research document to be utilized by corporations, local and federal government entities and utilities to aid in compliance with the Clean Air Act Amendments.

- Task #16** **Alternative Fuel Vehicle Training Program for** (Washington, DC)
DC Public Schools Phelps Career High School
Automotive Training Program

This focus of this project is to develop an alternative fuel vehicle training curriculum for the District of Columbia Public School Phelps Career High School Automotive Training Program. The DC Energy Office (DPW/DCEO) will design an alternative fuel vehicle training component to the existing training program at Phelps with a focus on developing a pool of mechanics in the Washington metropolitan area trained to perform general maintenance and repairs on alternative fuel vehicles.

- Task #17** **Preparing Local Regulations for Tomorrow's** (Santa Barbara County)
Electric Vehicle

The California Air Resources Board Low Emission Vehicle Rule requires that, beginning in 1998, 2% of all vehicles sold in California by major manufacturers be zero emission. The only technology at the moment that meets that criterion is the battery-powered electric vehicles. Santa Barbara County proposes to prepare a report that addresses local regulatory barriers to introducing EVs and related charging facilities, and promoting EV-related regulatory incentives at the local level of government. There are national and state groups that are currently addressing some of the related issues. In such cases, effort would be focused on disseminating and, as appropriate, exploiting the results of these efforts for local application.

UTILITY & INDUSTRIAL/COMMERCIAL & GOVERNMENT ENERGY EFFICIENCY

- Task #18** **Competitive Franchise Study** (Barnstable County, MA)

This study will provide applied research for local governments interested in competitive franchise. A report will be produced containing sections on the background of local utility franchise contracts, the mechanisms for competitive franchises, a full discussion of contract issues and a sample RFP and Contract, discussion of stranded investment issues and a discussion on compatibility of the competitive franchise with other proposed restructuring.

- Task #19** **Two-Step Electric Demand Reduction** (Pittsburgh, PA)

The purpose of this project is to demonstrate the savings resulting from the implementation of a two-step program for reducing electrical demand peaks -- replacing heating and air-conditioning systems with a York "Triathlon" natural gas heating and cooling system. The existing natural gas emergency generator will be wired into the building's electrical system so that it will come on whenever the SCBA compressors are running or whenever the demand exceeds a certain level.

- Task #20** **From Kilowatts to Megawatts: Utilizing** (San Francisco, CA)
Alternative Delivery Systems for Large-Scale
Energy Savings

This project is to evaluate alternative project delivery and management systems for implementing large scale, multi-year, multiple facility, energy retrofit projects. If municipal energy efficiency is to make a significant contribution to the urban

economy, to improved local air quality and to solving global environmental problems, then the pace of energy retrofitting of existing local government buildings must be greatly accelerated. The for San Francisco, of which this project is a key element, is to develop a project management and financing capability that will enable the City to rapidly implement the \$15-20 million dollars of energy retrofits necessary to capture the conservation potential a recent study has confirmed. This project will provide guidance on alternative methods of energy project management and financing; including the use of private sector energy service companies and other non-profit equivalents. It will provide the pros and cons on the use of non-traditional project delivery systems; direction on when they are appropriate; guidance on selecting the right management alternative; and direction on developing appropriate contract materials and management procedures.

Task #21 Standardized VAV System Control for Optimal (Montgomery Cnty, MD)
Energy Efficiency

In developing, testing and applying new technologies to increase energy efficiency and reduce greenhouse gas emission, local governments find some difficulties in the understanding of the proper control and coordination of the advanced technological options now available in a typical commercial VAV HVAC systems. This project is to assist the proper deployment of several efficient HVAC technologies by overcoming this central roadblock. A standardized VAV control sequence will be developed in an unambiguous symbolic form to optimize system energy efficiency. Supporting standardized specifications for sensors, dampers, and air-handlers will be provided.

Task #22 Induction Lighting for Public Buildings (Philadelphia, PA)

This project is to analyze and develop applications for optimal use of induction lighting technology in public buildings, through review of existing European applications, and through actual demonstration installations of Philips QL induction lamp systems at City of Philadelphia facilities. Induction lighting is a relatively new lighting technology which provides for high energy efficiency, in addition to extremely high life expectancy as compared to standard lighting systems. The cost of lighting maintenance in high ceiling and other relatively inaccessible areas is an on-going problem in public buildings. Induction lighting provides for extremely long life (rated in excess of 60,000 hours) and high color rendering while providing lamp efficiency similar to existing high color rendering fluorescent of HID lighting.

Task #23 Performance Based Franchise Agreements and (Portland, OR)
Aggregated Energy Purchases

This project is to review Portland's existing electric franchises and licensing procedures and develop a clear and shared vision with utilities for the benefit of regulators, citizens, the city, and utility companies. The equity and appropriateness of charges in the rate schedule for Portland's largest electric account, street lighting, will be reviewed. Will begin discussions with the two electric utilities to review present franchises and license provisions.