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Prepared for U.S. Department of Energy

August 1978

Assistant Secretary for Energy Technology
Division of Solar Energy
Under Contract No. EG-77-C-01-4101

Biomass Fuel Systems

Directory of Sources and Potential Users

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Prepared for U.S. Department of Energy
Assistant Secretary for Energy Technology
Division of Solar Energy
Fuels from Biomass Systems Branch
Washington, D.C. 20545

August 1978

Biomass Fuel Systems

Directory of Sources and Potential Users

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Under Contract No. EG-77-C-01-4101

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ABSTRACT

Sources and potential users of technical information on biomass fuel systems have been identified. Organizations and individual contacts are listed in various production and conversion categories.

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INTRODUCTION

Biomass is receiving considerable attention as an important fuel and chemical feedstock. As a result, the Department of Energy has received numerous requests for technical information on biomass fuel systems.

It would be impossible to obtain detailed information about all aspects of "biomass fuels" from a single source because so many production, conversion and utilization options exist. The best information can be obtained from those organizations which are actively involved in the development, design, manufacture and use of specific biomass fuel systems. Many of these sources of information are identified here. Representative users of technical information are also listed.

Sources of technical information on biomass fuel systems are identified in Section I. These sources are grouped under general headings such as biomass production and conversion technologies. These general categories are further divided, whenever possible, to identify specific biomass feedstocks and conversion systems.

A partial list of potential users of technical information is presented in Section II. This list includes organizations, such as forest product companies, which are obviously interested in the development of biomass fuel systems. It also includes groups which

are showing a new awareness of the potential uses of biomass energy. The National Realtors Association and the National Recreation and Park Association are representative of this group.

In many cases, sources of technical information are also users of that information. Placement of an organization into one category or subcategory rather than another was often based on an arbitrary division. An alphabetical index is provided to help locate specific references.

It is necessary to emphasize that "fuels from biomass" is a rapidly changing field. New approaches and technological advances can be expected to change biomass R&D and commercialization programs. It will be necessary to frequently revise this document if it is to reflect the current "state-of-the-art."

ORGANIZATION OF THE INFORMATION BASE

The directory is divided into two general categories. (See Table I, following page.) Category I contains the names of persons and organizations which are informed on what is happening in a particular area of bio-energy development. Category II is a sampling of companies, government agencies and other organizations which may be interested in receiving current data on bio-energy research and development.

The line between a source of information and a potential user is a fine one. In many cases an organization could appropriately be listed in both categories. The names which appear in the second category represent for the most part some of the industries and organizations which have shown specific interest in biomass in recent years.

The general organization of the information base in Category I can be summarized as follows:

- A. General Information - This category includes those organizations capable of giving an overview of biomass as a fuel or energy resource, and of orienting a potential user towards more specific information relating to his area of interest.
- B. Systems Studies - This category includes those organizations which have conducted systems engineering studies, resource recovery analyses and conceptual research relating to the use of biomass as fuel. Where possible the major area of involvement is indicated.

TABLE I

SOURCES AND RECIPIENTS OF TECHNICAL INFORMATION ON BIOMASS FUEL SYSTEMS

I. <u>SOURCES OF INFORMATION</u>	II. <u>RECIPIENTS OF INFORMATION</u>
A. General Information	A. Federal Agencies
B. System Studies	B. State Agencies
C. Biomass Production	C. Trade Associations
1. Residues	D. Utilities
a. Forest Residues b. Agricultural Residues	E. Industry
2. Energy Farms	1. Forest Products
a. Silvicultural Energy Farms Biomass Harvesting Equipment b. Agricultural Energy Farms c. Fresh Water Energy Farms d. Marine Energy Farms	2. Petrochemicals
D. Conversion Technologies	3. Auto/Petroleum
1. Densification	4. Wood Boiler Firms
2. Thermochemical Processes	5. Other Industries
a. Direct Combustion Architecture & Engineering Firms b. Gasification/Pyrolysis c. Liquefaction/Pyrolysis	F. Agriculture
3. Bioconversion Processes	1. Producers/Processors
a. Fermentation b. Anaerobic Digestion	2. Machinery/Manufacturers
	G. Alternative Energy Information Organizations
	H. International Organizations

C. Biomass Production - This category includes organizations which are involved in research and development or in commercialization relating to production of biomass. Subcategories within the production area are as follows:

1. Residues

- a. Forest Residues - These include biomass material associated with the forest industry operations, logging and mill residues. Surplus forest growth is also considered a residue. This source is presently available and equipment exists to recover it. Improved collection machinery is presently being developed. Within certain climatic limitations this biomass resource is available on a year-round basis.
- b. Agricultural Residues - This resource includes crops and feed-lot manures. The availability of crop biomass generally follows a seasonal pattern, but manures are available on a year-round basis. Collection systems for agricultural residues are well-developed but improved methods, including on-site densification, are being researched.

2. Energy Farms

- a. Silvicultural Energy Farms - Tree crops will be intensively managed on a short rotation schedule. The technology of tree farming will be based on agricultural practices such as irrigation and fertilization. Continuing research includes identifying and developing high-yield species. This resource is available on a rotating year-round basis.

Companies involved in the manufacture and/or development of specialized tree harvesting equipment are listed in this section under "Biomass Harvesting Equipment".

- b. Agricultural Energy Farms - This resource involves the production of agricultural crops such as wheat, corn, sugarcane, sorghum, etc., and other herbaceous plants such as grasses for their fuel rather than food value. Conventional production and

harvesting technology is well established. In most areas this resource will be available on a seasonal basis.

- c. Fresh Water Energy Farms - Fresh water plants such as various algae, duckweed and water hyacinth can be grown for their fuel value. Research and development has begun on improving production and harvesting systems.
- d. Marine Energy Farms - Intensive research is underway to develop certain marine plants, particularly giant California kelp, as a food/fuel/feedstock resource. This source would be available on a year-round basis.

D. Conversion Technologies

1. Densification

Densification or pelletization is a method for converting biomass into a homogeneous, easily handled and stored organic fuel. Densified biomass can be used in direct combustion systems or as a feedstock for thermochemical conversion. The technology is presently available and can be used on a wide variety of biomass materials.

2. Thermochemical Processes

- a. Direct Combustion - Direct Combustion of biomass to produce steam/heat or electricity is a well established technology. An increasing number of users are relying on direct combustion to supply a part or all of their energy needs. A separate heading, "Architecture and Engineering Firms" is included at the end of this section. These firms are specifically knowledgeable in wood-fired combustion systems.
- b. Gasification/Pyrolysis - Numerous gasification systems using biomass materials are in the process of development. Some experimental and commercial gasification units are already in production.
- c. Liquefaction/Pyrolysis - This technology is still in the experimental stage. Most of the sources listed are, therefore, research and development programs. Where possible the source of biomass feedstock is identified.

3. Bioconversion Processes

- a. Fermentation - Source data in this section includes research into the hydrolysis of cellulosic material and the fermentation of sugars to alcohol. Fermentation is a well-established technology, but research is being directed to the improved conversion of cellulosic materials to alcohols.
- b. Anaerobic Digestion - Anaerobic digestion is the result of bacterial conversion of biomass to methane in the absence of oxygen. The technology involved is currently available for use with certain biomass feedstocks such as manures and certain cellulosic residues. Improved techniques are being developed in current research programs.

Category II is defined as Recipients of Information and potential users of biomass. Many names listed in this category are also excellent sources of information in specific biomass areas.

- A. Federal Agencies - Many federal agencies and institutions should receive up-to-date information on biomass systems. Some of the agencies which have expressed interest in bio-energy are listed here.
- B. State Agencies - State agencies, commissions or offices should be recipients of biomass data. Often they are good sources of local biomass developments.
- C. Trade Associations - National trade and professional associations are a good way to disseminate technical information to a large audience. Included in this section is a partial listing of associations considered to be potentially interested recipients of technical information on biomass development. A complete list of trade associations can be found in the directory: National Trade and Professional Associations of the United States and Canada and Labor Unions, 13th annual edition, 1978, Craig Colgate, Jr., editor. Columbia Books, Inc., Washington, DC 20005.
- D. Utilities - Some of the utilities which have expressed an interest in bio-energy development and application are included in this section. Additional utility companies can be identified in the trade association list.

E. Industry - Because of the nature of their operations some industries may be more interested in bioenergy development for fuel than others. This section has therefore been divided into subcategories which identify some companies presently using biomass systems or which have expressed interest in such systems. The list is by no means complete, and can be expanded by referring to the section on trade associations.

1. Forest Products

Companies interested in the use of biomass for process steam/heat generation. Many of the firms listed are also potential sources of data on biomass production, recovery and handling.

2. Petrochemicals

Companies interested in biomass as a feedstock to produce chemicals and substitute fuels.

3. Auto/Petroleum

Companies interested in biomass-derived transportation fuels.

4. Wood Boiler Firms

Companies interested in the market resulting from an increased use of biomass as fuel. Some of the companies listed here should also be considered as sources of information on direct combustion.

5. Other industries

Miscellaneous companies which have expressed some interest in biomass as a fuel or feedstock.

F. Agriculture

1. Producers/Processors

Companies which have expressed interest in the use of agricultural surplus production and residues from both production and processing as a source of energy or feedstock are included

2. Machinery Manufacturers

Companies which are involved in the harvesting or densification of agricultural materials and have shown interest in bio-energy are included.

- G. Alternative Energy Information Organizations - The organizations listed here represent a limited sampling of citizen and consumer groups as well as some public-interest research groups which are involved in alternative energy dissemination.
- H. International Organizations - Many of the organizations listed are experts on bio-energy programs being developed in other countries and are prime candidates for information exchange.

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I. SOURCES OF INFORMATION

I. SOURCES OF INFORMATION

A. General Information

The Bio-Energy Council
1337 Connecticut Avenue, NW
Washington, DC 20036
Paul Bente
(202) 833-5656

The Biomass Energy Institute
304-870 Cambridge Street
Winnipeg, Manitoba R3M 3H5, Canada
Ernest E. Robertson
(204) 284-0472

Energy, Department of
Fuels From Biomass Branch
600 E Street
Washington, DC 20545
Nello delGobbo
Acting Chief
(202) 376-1610

Oak Ridge National Laboratory
P.O. Box X, Building 2024
Oak Ridge, TN 37380
Robert VanHook
(615) 483-8611

Solar Energy Research Institute
Research Division, Biological and Chemical
Conversion Branch
1536 Cole Boulevard
Golden, CO 80401
T. A. Milne, Acting Chief
(303) 234-7171

Tennessee Valley Authority
Commerce Union Bank Building
Chattanooga, TN 37400
Harold Falkenberry
(615) 755-3011

B. Systems Studies

Joseph E. Atchison, Inc.
30 East 42nd St.
New York, NY 10017
Joseph E. Atchison
(212) 986-0016
Subject: Preliminary Evaluation of New Process
for Separation of Components of Sugar
Cane

Battelle Memorial Laboratories
505 King Avenue
Columbus, OH 43201
Edward G. Lipinsky
(614) 424-6424
Subject: System Studies of Fuels from Sugar
and Corn

California Institute of Technology
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91103
J. J. Kalvinskas
(213) 354-2349
Subject: Technical and Economic Evaluation of
Bioconversion Processes as Alternative
Source of Energy

Dartmouth College
Power Task Force
Box 8000
Hanover, NH 03755
Dennis Meadows
(603) 646-3551
Subject: Identify Social, Economic and Environ-
mental Impacts of Wood Burning in the
Northeast

Development Planning & Research Associates, Inc.
200 Research Drive, P.O. Box 727
Manhattan, KS 66502
(913) 539-3565
Subject: Gasohol Economic Feasibility Study

B. Systems Studies (Continued)

Dynatech R&D Company
99 Erie Street
Cambridge, MA 02139
Donald L. Wise
(617) 868-8050
Subject: Fuel Gas Production from Animal
Residue; Aquatic Biomass Farms

Institute of Gas Technology
3424 South State Street
Chicago, IL 60610
Donald Klass
(312) 567-3650
Subject: Gasification and Fermentation Studies
Using Various Biomass Sources

InterTechnology/Solar Corporation
Box 340
Warrenton, VA 22186
G. C. Szego
(703) 347-7900
Subject: Integrated Energy Farms

Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110
A. D. McElroy
(816) 753-7600
Subject: Systems Study of Fuels from Grains

The MITRE Corporation/Metrek Division
1820 Dolley Madison Boulevard
McLean, VA 22102
David J. Salo
(703) 827-6000
Subject: Silvicultural Biomass Study

North Carolina State University
School of Forest Resources
Raleigh, NC 27650
M. P. Levi
(919) 737-3386
Subject: Economics and Characteristics of Wood
Handling Systems in Small to Medium
Sized Boilers

B. Systems Studies (Concluded)

TEKNEKRON
2118 Milvia Street
Berkeley, CA 94704
Gladys Sessler
(415) 848-1464
Subject: Agricultural Crops for Fuel

United Technologies Research Center
Silver Lane
East Hartford, CT 06108
Robert Lessard
(203) 565-4321
Subject: Assessment of Biomass Potential for
Electric Power Generation in the
Northeast

C. Biomass Production

1. Residues

a. Forest Residues

Complete Tree Institute
University of Maine
Orono, ME 04473
Harold E. Young
(207) 581-1110
Subject: Wood as Fuel

WESTVACO Research Center
P.O. Box 5207
N. Charleston, SC 29406
S. Ingemar Falkehag
(803) 744-8231
Subject: Pulping and Lignocellulose
Utilization

Weyerhaeuser Company
Tacoma, WA 98401
Robert L. Jamison
(206) 924-2697
Subject: Develop Maximum Use of
Forest Residues as Energy
Source

Forest Service Field Offices:

Forest Service, USDA
Northern Region (R-1)
Federal Building
Missoula, MO 58907

Forest Service, USDA
Rocky Mountain Region (R-2)
11177 West 8th Avenue
P.O. Box 25127
Lakewood, CO 80225

Forest Service, USDA
Southwestern Region (R-3)
Federal Building
517 Gold Avenue, SW
Albuquerque, NM 87102

a. Forest Residues (Continued)

Forest Service, USDA
Intermountain Region (R-4)
324-25th Street
Ogden, UT 84401

Forest Service, USDA
California Region (R-5)
630 Sansome Street
San Francisco, CA 94111

Forest Service, USDA
Pacific Northwest Region (R-6)
319 SW Pine Street
P.O. Box 3623
Portland, OR 97208
J. Howard

Forest Service, USDA
Southern Region (R-8)
1720 Peachtree Road, NW
Atlanta, GA 30309

Forest Service, USDA
Eastern Region (R-9)
633 West Wisconsin Avenue
Milwaukee, WI 52303
John Zerbe

Forest Service, USDA
Alaska Region (R-10)
Federal Office Building
P.O. Box 1628
Juneau, AK 99802

Forest Service, USDA
Southeastern Experiment Station
Olustee, FL 32072
R. R. Roberts

Forest Products Laboratory
P.O. Box 5130
North Walnut Street
Madison, WI 53705
Jerome Saeman

a. Forest Residues (Concluded)

Institute of Tropical Forestry
U. S. Forest Service
P. O. Box A
Rio Piedras, PR 00928

North Eastern Forest Experiment
Station
370 Reed Road
Broomall, PA 19008

Pacific Southwest Forest and Range
Experiment Station
1960 Addison Street
P. O. Box 245
Berkeley, CA 94701

Rocky Mountain Forest and Range
Experiment Station
240 West Prospect Street
Fort Collins, CO 80521

Southeastern Forest Experiment Station
Post Office Building
P. O. Box 2570
Asheville, NC 28802
J. McClure

Southern Forest Experiment Station
Room T-10210
Postal Services Building
701 Loyola Avenue
New Orleans, LA 70113

U.S. Forest Service
Resources Evaluation Group
Post Office Box 2417
Washington, D.C. 20013
Thomas Hamilton
(202) 447-3732
Subject: Forest Biomass Inventory

b. Agricultural Residues

Hawaiian Sugar Planters Association
P.O. Box 1057
Aiea, Oahu, HI 96701
Edward J. Lui
(808) 487-5561
Subject: Research on Sugar Crops as
Energy Biomass

Oahu Sugar Company, Ltd.
Waipahu, Oahu, HI 96797
R. Proffitt
(808) 677-3357
Subject: Sugarcane Residues for Cogeneration
in Mill Operations

Stanford Research Institute
333 Ravenswood Avenue
Menlo Park, CA 94025
(415) 326-6200
Subject: Evaluation of Agricultural
Residues of Energy Feedstock

University of California
Lawrence Berkeley Laboratory
Laboratory of Chemical Biodynamics
Berkeley, CA 94700
Melvin Calvin
(514) 843-2740
Subject: Examination of Photosynthesis as a
Possible Renewable Energy Source

University of Florida
Agricultural Research Center
Belle Glade, FL 33430
Gary L. Gascho
(305) 996-3062
Subject: Sugar Cane Biomass Production

USDA/AES
University of Missouri
Columbia, MO 65201
Elmer R. Kiehl
(314) 882-3846
Subject: Food, Fiber and Energy

b. Agricultural Residues (Concluded)

USDA/ARS

U.S. Sugarcane Field Laboratory

P.O. Box 470

Houma, LA 70361

James E. Irvine

(504) 872-6316

Subject: Close Row Spacing for Biomass
Production

2. Energy Farms

a. Silvicultural Energy Farms

Agricultural Experiment Station
University of Kentucky
Lexington, KY 40506
S. B. Carpenter
(606) 258-4609

Department of Forestry
Illinois Agricultural Exp. Sta.
University of Illinois
Urbana, IL 61801
F. L. Rolfe
(217) 333-1000
Subject: Biomass Production for
Energy Conversion

Department of Forestry
Iowa State University
Ames, IA 50010
J. Gordon
(515) 294-1166
Subject: Yield Prediction of Hardwoods

Department of Forestry
Kansas State University
Manhattan, KS 66506
W. A. Geyer
(913) 532-6923
Subject: Sycamore, Maple, Cottonwood

Department of Forestry
Michigan Technological University
Houghton, MI 49931
R. L. Sajdak
(906) 487-1885
Subject: Sugar Maple and Black Locust
to Energy Farm Concept

Georgia Institute of Technology
Atlanta, GA 30332
Daniel O'Neil
(404) 894-2000
Subject: Production of Trees for Fuels

a. Silvicultural Energy Farms (Continued)

Georgia Forestry Commission
Macon, GA 31200
James Wynens
(912) 744-3243
Subject: Tree Farms

International Paper Company
Southlands Experiment Forest
Bainbridge, GA 31717
Ron Hunt
(912) 246-3642
Subject: Softwood and Hardwood Studies

Marelco, Inc.
407 North Maple Drive
Beverly Hills, CA 92010
(213) 276-5225
Subject: Literature Review of Feasibility of Eucalyptus Farms

MATHTECH, Inc.
P.O. Box 2392
Princeton, NJ 08540
D. E. Cullen
(609) 799-2600
Subject: Harvesting of Short-rotation Woody Biomass

Michigan State University
E. Lansing, MI 48824
J. W. Hanover
(517) 355-0090
Subject: Tree Species for Biomass

The MITRE Corporation/Metrek Division
1820 Dolley Madison Boulevard
McLean, VA 22102
David Salo
(703) 827-6000
Subject: Design of Pilot Energy Farm at Aiken, SC

a. Silvicultural Energy Farms (Continued)

North Carolina State University
Department of Forestry
Raleigh, NC 27607
Robert Kellison
(919) 953-3717
Subject: Tree Farm Research

Pennsylvania State University
University Park, PA 16802
T. W. Bowersox
(814) 865-4841
Subject: Hybrid Poplars

Pennsylvania State University
University Park, PA 16802
W. E. Sopper
(814) 865-2541
Subject: Biomass Production Using
Waste Heat

School of Forest Resources
North Carolina State University
Raleigh, NC 27650
M. P. Levi
(919) 737-3386
Subject: Wood Fuel Handling in Small/
Medium Boilers

School of Forest Resources and Conser-
vation
University of Florida
Gainesville, FL 32611
George Meskimen
(904) 392-1971
Subject: Eucalyptus Energy Farms

South Carolina Commission of Forestry
P.O. Box 21707
Columbia, SC 29200
Marvin Gaffney
(803) 758-2261
Subject: Tree Energy Farms

a. Silvicultural Energy Farms (Continued)

Seattle City Light Company
Office of Environmental Affairs
1015 Third Avenue
Seattle, WA 98104
C. S. Harlow
(206) 625-3590
Subject: Forest Production for Fuel

Solar Energy Research Institute
1536 Cole Boulevard
Golden, CO 80401
Robert Inman
(303) 234-7171

University of California-Riverside
Dept. of Soil & Environmental Sciences
Riverside, CA 92521
P. Felker
(714) 787-3706
Subject: Species Growth Rate Under
Controlled Conditions

University of Georgia
School of Forest Resources
Athens, GA 30602
Klaus Steinbeck
(404) 542-1376
Subject: Hardwood Production

University of Houston
3800 Cullen Boulevard
Houston, TX 77004
J. R. Cowles
(713) 749-3135
Subject: Chinese Tallow Tree as Biomass
Fuel Source

a. Silvicultural Energy Farms (Continued)

University of Minnesota
Soil Science Department
St. Paul, MN 55108
R. S. Farnhaz
(612) 373-1447
Subject: Economics of Energy Farms

University of Washington
College of Forest Resources
Seattle, WA 98195
Richard Stettler
(206) 543-2723
Subject: Short-Rotation Coppice Culture

USDA/AES
Clemson University
Clemson, SC 29631
W. C. Godly
(803) 656-3140
Subject: Softwoods Studies

USDA/AES
University of Nevada
Reno, NV 89557
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Subject: Softwoods Research

USDA/ARS
Southeast Watershed Research Center
P.O. Box 5677
Athens, GA 30604
Paul Yates
(404) 546-3131
Subject: Silviculture Forest Management

USDA/Forest Service
Forestry Science Laboratory
Athens, GA 30602
J. R. Saucier
(404) 546-2422
Subject: Sycamore

a. Silvicultural Energy Farms (Continued)

USDA/Forest Service
North Central Experiment Station
Box 898
Rhinelander, WI 54501
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(715) 362-7474
Subject: Intensive Biomass-Yield Tree
Farms

USDA/Forest Service
Southeastern Forest Experiment Station
P.O. Box 2570
Asheville, NC 28802
Jack Stubbs
(803) 824-6331
Subject: Research on Paraquat-Treated
Pine Trees

Utah State University
Institute for Land Rehabilitation
Logan, UT 84321
C. M. McKell
(801) 752-4100
Subject: High Producing Shrubs for
Biomass

Virginia Polytechnic Institute
Blacksburg, VA 24061
T. A. Walbridge
(703) 951-6391
Subject: Investigation of Woody Biomass
Systems

Virginia State Forestry Commission
Charlottesville, VA 22901
Wallace F. Custard
(804) 977-6555
Subject: Research on Energy Tree Farms

Washington State University
Pullman, WA 99164
R. C. Chapman
(509) 335-5296
Subject: Evaluation of Tree Biomass Yields

a. Silvicultural Energy Farms (Concluded)

Biomass Harvesting Equipment

Morbark Industries

Winn, MI 48896

Pete Ratcliffe

(517) 866-2381

Subject: Harvesting Equipment

N. F. I., Inc.

6407 Masonic Drive

Alexandria, LA 91301

James O'Dair

(318) 487-8371

Nicholson Manufacturing Company

3670 E. Marginal Way, S.

Seattle, WA 98134

W. T. Nicholson

(206) 682-2752

North Carolina Forest Extension
Service

James Mattson

Houghton, MI 49931

Subject: Biomass Harvesters

Rome Industries

Cedartown, GA 30125

Sam Coughran

Subject: Tree Puller that Harvests
Central Root Mass

USDA/FS

Southern Forest Experiment Station

2500 Shreveport Highway

Pineville, LA 71360

Peter Koch

(318) 445-6511

Subject: Reference Information and
Biomass Harvester

b. Agricultural Energy Farms

Louisiana State University
Department of Chemical Engineering
Baton Rouge, LA 70803
Joseph A. Polack
(504) 388-2065

Lawrence Berkeley Laboratories
University of California
Berkeley, CA 94700
Melvin Calvin
(415) 843-2740
Subject: Hydrocarbons and Energy
from Plants

USDA/AES
University of Florida
1022 McCarty Hall
Gainesville, FL 32611
K. R. Tesertiller
(904) 392-1791
Subject: Sugar Crops

USDA/AES
University of Puerto Rico
P.O. Box H
Rio Piedras, PR 00928
Alex G. Alexander
(809) 767-9705
Subject: Sugar Crops

c. Fresh Water Energy Farms

Battelle Columbus Laboratories
505 King Avenue
Columbus, OH 43201
A. C. Robinson
(614) 424-6424
Subject: Hyacinth Research

University of California
College of Engineering
301 S 46th Street
Richmond, CA 94804
W. J. Oswald
(415) 642-0835
Subject: Algae Research

University of California
Lawrence Livermore Laboratory
Livermore, CA 94550
Raymond L. Ward
(415) 457-4976
Subject: Algae Studies

University of Manitoba
Department of Botany
Winnipeg, Manitoba
Canada R3T 2N2
E. Roy Waygood
(204) 474-8880
Subject: Algae Production on Waste Water

National Aeronautics and Space Adminis-
tration
NSTL Station
Bay St. Louis, MS 39529
B. C. Wolverton
(601) 688-3155
Subject: Water Hyacinth Plant Program

d. Marine Energy Farms

California Institute of Technology
Division of Engineering and Applied
Science
1201 E. California Boulevard
Pasadena, CA 91125
Wheeler J. North
(213) 795-6811
Subject: Physiological Studies of
Kelp Growth

Columbia University
School of Engineering and Applied
Chemistry
553 Terrace Building
New York, NY 10027
Harry P. Gregor
(212) 280-1754
Subject: Mariculture from the Heat of
OTEC Plants

Dynatech R&D Company
99 Erie Street
Cambridge, MA 02139
Donald L. Wise
(617) 868-8050
Subject: Marine Algae

Exxon Research and Engineering Company
Corporate Research Laboratories
P.O. Box 45
Linden, NJ 07036
Robert Hirsch
(201) 474-0100
Subject: Laboratory Research on Kelp
Biomass

Gas Research Institute
10 W 35th Street
Chicago, IL 60616
Ab Flowers
(312) 567-6606
Subject: Kelp Farm Project

d. Marine Energy Farms (Continued)

General Electric Company
King of Prussia, PA 19406
Alan Tompkins
(215) 962-6000
Subject: Kelp Farm Project

General Electric Company
777 14th Street NW
Washington, DC
Rudolf Trefney
(202) 637-4000
Subject: Marine Bioconversion
Production

Global Marine Development, Inc.
Newport Beach, CA 92600
Manfred Kruteen
(714) 752-5050
Subject: Kelp Farm Project

Groton BioIndustries Development
Company
Division of Groton Associates, Inc.
P. O. Box 517
Groton, MA 01450
Harold H. Webber
(617) 448-5916
Subject: Design & Implementation of
Aquaculture Systems

Naval Ocean Systems Center
San Diego, CA 92132
Howard Wilcox
(714) 225-2354
Subject: Production and Conversion of
Ocean Energy Farm Systems

Science Applications, Inc.
1200 Prospect Street
LaJolla, CA 92038
Gilbert R. Stegen
(714) 459-0211
Subject: Assessment of Marine Biomass
Materials

d. Marine Energy Farms (Concluded)

Woods Hole Oceanographic Institute

Woods Hole, MA 02543

John H. Ryther

(617) 548-1400

Subject: Potential of Aquatic Plants
as Biomass Source

D. Conversion Technologies

1. Densification

Agnew Environmental Products
211 SE 10th Street
P.O. Box 1168
Grants Pass, OR 97526
L. L. Thompson
(503) 479-3396

Bio-Solar Research & Development
Corporation
P.O. Box 762
Eugene, OR 97401
Rudolf W. Gunnerman
(503) 686-0765

Bonnot Company
805 Lake Street
Kent, OH 44240
(216) 673-5829

California Pellet Mill Company
1800 Folsom Street
San Francisco, CA 94013
Robert MacDaniels
(415) 431-3800

Fourply, Inc.
P.O. Box 890
Grants Pass, OR 97526
Maurice Saunders
(503) 479-3301

Guaranty Performance Company, Inc.
P.O. Box 748
Independence, KS 67301
Andrew Livingston
(316) 331-0027

Oregon State University
Department of Forest Products
Corvallis, OR 97331
Raymond A. Currier
(503) 753-9166

1. Densification (Concluded)

Papakube Corporation
Energy Cube Division
931 East Harbor Drive
San Diego, CA 92101
Jerry Nelson
(714) 231-1490

Sprout Waldron Company, Inc.
Metal Products Division
Muncy, PA 17756
Kenneth Sternett
(717) 546-8211

D. Conversion Technologies

2. Thermochemical Processes

a. Direct Combustion*

Abitibi Paper Company
Mississauga
Ontario LSK 1A9 Canada
F. L. Morton
(416) 822-4770
Subject: Paper Plant Waste Burning

Bowater Southern Paper Company
Mill Engineering Department
Calhoun, TN 37309
S. E. Bettis
(615) 336-2211
Subject: Burning of Wood Residues to
Supply Some Mill Energy
Requirements

Burlington Electric Company
Burlington, VT 05401
(802) 658-0300
Subject: 50Mw Wood-Fired Power Plant
Under Construction

Energex, Ltd.
P.O. Box 4208
North Portland, OR 97208
Lloyd Day
(503) 286-8231
Subject: Commercialization of the
Jasper-Kock Suspension Burner
for Wet Woody Fuels

*For an additional listing of companies involved in
direct combustion technology, refer to Section II
on Wood Boiler Firms

a. Direct Combustion (Continued)

Eugene Water and Electric Board
500 East 4th Avenue
P.O. Box 10148
Eugene, OR 97401
Owen D. Brown
(503) 484-2411
Subject: Central Heating and Electric
Power for Wood Residues

Fourply, Inc.
P.O. Box 890
Grants Pass, OR 97526
Maurice Saunders
(503) 479-3301
Subject: Wood-Fired Heating for Plywood
Factory

Hilo Coast Processing Company
P.O. Box 18
Pepeekeo, HI 96783
Donald J. Martin
(808) 963-6211
Subject: Electricity Generated from
Sugar Cane Residues

Kipper & Sons Engineers, Inc.
2616 Western Avenue
Seattle, WA 98121
G. W. Kipper
(206) 622-4545
Subject: Design and Manufacture of Waste
Fuel Systems

MacMillan Bloedel Ltd.
6270 Yew Street
Powell River, BC C8A 427
R. S. Lees
(604) 483-3722
Subject: Energy from Wood Residues for Use
in Canada's Largest Paper Mill

a. Direct Combustion (Continued)

Moore-Oregon-Canada
P.O. Box 4208
Portland, OR 97208
(503) 286-8231

Northwest-Pacific Corporation
Suite 600, Plaza 600 Building
Seattle, WA 98101
Donald W. Pingrey
(202) 623-7224
Subject: Analysis of Wood-fired
Electric Power Generating
Plants

Sonoco Products
North 2nd Street
Hartsville, SC 29550
J. L. Diehl
(803) 383-7255
Subject: Conversion of Bark and Other
Residues into Steam for
Electric Generation

Tennessee Valley Authority
Norris, TN 37828
Larry Klein
(615) 546-6912
Subject: Wood as Fuel

Ultrasystems, Inc.
2400 Michelson Drive
Irvine, CA 92715
(714) 752-7500

Washington Office:
Robert Kennel
(703) 821-1960
Subject: Wood Furnace Development

University of Maine
Department of Agricultural Engineering
Orono, ME 04473
John G. Riley
Subject: Develop Automated System for
Heating Large Buildings with
Forest Residues as Fuel

a. Direct Combustion (Concluded)

University of Oregon
Physical Plant
Eugene, OR 97403
Harold Babcock
(503) 686-5243
Subject: Burning Wood Residue to Cogen-
erate Electric Power for Campus

Vermont Agency of Environmental Conser-
vation
Department of Forests, Parks & Recreation
Montpelier, VT 05602
David Stevens
(862) 828-3375
Subject: Wood-fired Boilers for Power
Generation

Vermont National Resources Council
26 State Street
Montpelier, VT 05602
(862) 223-2328
Subject: Evaluation of Whole-tree Harvest-
ing Experiment for Wood-fired
Boiler Heating System in Hospital

Wheelabrator Clean Fuels Corporation
1700 K Street, NW
Suite 801
Washington, DC 20036
Gary Allison
(202) 296-5173
Subject: Wood as Fuel for Power Generation

Wheelabrator-Frye, Inc.
Liberty Lane
Hampton, NH 03842
John Kehoe
(603) 926-5911
Subject: Wood-fired 50 Mw Power Plant in
Lincoln, ME

Woodamation, Inc.
P.O. Box 1365
Chalmette, LA 70044
(504) 279-1010

Architecture and Engineering Firms

Brown and Root, Inc.
4100 Clinton Drive
Houston, TX 77020
(713) 676-3011

Can-Am Sales Corporation
P.O. Box 158
Skaneateles, NY 13152
(315) 685-5611

Combustion Equipment Assoc., Inc.
5555 Madison Avenue
New York, NY 10022
(212) 980-3700

Combustion Power, Inc.
1346 Willow Road
Menlo Park, CA 94025
(415) 324-4744

Energy Resources Company, Inc.
185 Alewife Brook Parkway
Cambridge, MA 02138
(617) 661-3111

Pyrotek, Inc.
2716 South Grand Avenue
Santa Ana, CA 92705
(714) 979-2075

Rust Engineering, Inc.
1130 22nd Street
Birmingham, AL 35205
(205) 254-4000

b. Gasification/Pyrolysis

Alberta Industrial Development, Ltd.
1704 Cambridge Building
Edmonton, Alberta, T5J 1R9, Canada
(403) 429-4094
Subject: Patented Gasification Process,
"Thermex"

Combustion Power, Inc.
1346 Willow Road
Menlo Park, CA
Milton Plum
(919) 872-5093
Subject: Low-Btu Gasification Process

Energy Products of Idaho
P.O. Box 153
Coeur d'Alene, ID 83814
N. K. Sowards
(208) 667-2481
Subject: Fluid-bed Incineration - Energy
Recovery from Combustible Wastes,
Primarily from Forest Residues

Garrett Energy Research & Engineering
911 Bryant Place
Ojai, CA 93023
(805) 646-0159
Subject: Thermal Conversion of Biomass
into Gaseous Products

Monsanto Enviro-Chem Systems, Inc.
800 North Lindbergh Boulevard
St. Louis, MO 63141
(314) 694-1000
Subject: Pyrolytic System Research from
Biomass

Nichols Engineering & Research Corporation
Homestead and Willow Road
Belle Mead, NJ 08502
Stephen A. Adiletta
(201) 359-8200
Subject: Manufacture of Briquettes
through Pyrolysis

b. Gasification/Pyrolysis (Continued)

Occidental Research and Development Company
10889 Wilshire Boulevard
Los Angeles, CA 90024
(213) 879-1700
Subject: Pyrolysis Gas from Biomass

Pioneer Hi-Bred International, Inc.
5700 Merle Hay Road
Johnson, IA 50131
Walter E. Stohlgren
(515) 245-3721
Subject: Corn Cob Gasifier

TechAir Corporation
2231 Perimeter Park
Atlanta, GA 30341
P. F. VanKeuren
(404) 458-9096
Subject: Pyrolysis of Wood

Texas Tech University
Lubbock, TX 79409
William J. Huffman
(806) 742-3553
Subject: Synthesis Gas from Manure

Union Carbide Corporation
270 Park Avenue
New York, NY 10017
(212) 551-2345
Subject: PUROX System for Wastes Utilization

University of West Virginia
Department of Chemical Engineering
Morgantown, WV 26506
Richard C. Bailie
(304) 293-0111
Subject: Pyrolysis from Wood Residues

Weyerhaeuser Company
Tacoma, WA 98401
William Munk
(206) 259-0425
Subject: Research on Wood Residues

b. Gasification/Pyrolysis (Concluded)

Wright-Malta Corporation

Plains Road

Ballston Spa, NY 12020

J. A. Coffman

(518) 899-2227

Subject: Design of Small Gasifier for
Biomass Residues

c. Liquefaction/Pyrolysis

Battelle Memorial Institute
Pacific Northwest Laboratories
Battelle Boulevard
Richland, WA 99352
P. M. Molton
(509) 946-2121
Subject: Biomass to Liquids

Bechtel Corporation
Scientific Development Department
50 Beale Street
San Francisco, CA 94119
T. Lindemuth
(415) 768-1234
Subject: Wood-to-Oil

Exxon Corporation
1251 Avenue of the Americas
New York, NY 10020
(212) 398-3000

General Motors Technical Center
Warren, MI 48090
Robert L. Furey
(303) 575-2853
Subject: Ethanol Fuel Research

University of California
Lawrence Livermore Laboratory
Livermore, CA 94550
C. R. Wilke
(415) 422-1100

USDA/Forest Service
Forest Products Laboratory
Madison, WI 53705
Roger Rowell
(608) 257-2211
Subject: Liquid Chemicals from Woods

3. Bioconversion Processes

a. Fermentation

Agricultural Products Industrial
Utilization Committee
P.O. Box 94831
Lincoln, NE 68509
Charles R. Fricke
(402) 471-2941
Subject: Development and Use of Gasohol Fuel

Army Development Center
Natick, MA 91760
Leo Spano
(617) 653-1000
Subject: Enzymatic Hydrolysis of Cellu-
lose to Glucose

Battelle-Columbus Institute
505 King Avenue
Columbus, OH 43201
Edward S. Lipinsky
(614) 424-6424
Subject: Fuels from Sugar and Corn

Bohler Brothers of America, Inc.
1625 West Belt North
Houston, TX 77043
B. J. Linden
(713) 465-8373
Subject: Complete Turn-key Facilities for
Alcohol Fermentation from Renewable
Agricultural Feedstocks

Dartmouth College
Thayer School of Engineering
Hanover, NH 03755
Hans Grethlein
(603) 646-2231
Subject: Acid Hydrolysis of Cellulosic
Biomass

General Electric Company
Research and Development Center
Box 8, Building K-1
Schnectady, NY 12301
R. Brooks
(518) 385-2211
Subject: Bioconversion of Plants to Ethanol

a. Fermentation (Continued)

Gulf Oil Chemicals Company
9009 West 67th Street
Shawnee Mission
KS 66201

George H. Emert
(913) 722-3200

Subject: Commercialization of ethanol
from biomass by early 1980's

InterTech Group, Inc.
7768 Woodmont Avenue
Bethesda, MD 20014
Donald M. Brewor
(301) 654-8762

Subject: Production of Ethanol from Carbo-
hydrates in Algae Cultures

University of California
Lawrence Berkeley Laboratory
Berkeley, CA 94700
Charles A. Wilke
(415) 843-2740

Subject: Bioconversion of Cellulose to
Ethanol

Massachusetts Institute of Technology
Cambridge, MA 02139
Daniel I. C. Wang
(617) 253-2126

Subject: Fermentation of Suagrs from
Biomass

University of Nebraska
Department of Chemical Engineering
Lincoln, NE 68588
W. A. Scheller
(402) 472-7211

Subject: Gasohol, an Alcohol Gasoline-
Additive from Grain

Purdue University
Renewable Resources Laboratory
West Lafayette, IN 47907
George Tsao
(317) 494-6151

Subject: Fermentation Using Cellulosic Wastes

a. Fermentation (Concluded)

Solar energy Research Institute
1536 Cole Boulevard
Golden, CO 80401
Thomas Reed
(303) 234-7127
Subject: Alcohol and Gasohol Fuels

Rensselaer Polytechnic Institute
Department of Chemical Engineering
Troy, NY 12181
Henry Bungay
(518) 270-6369
Subject: Fermentation of Biomass

Rutgers University
Cook College
New Brunswick, NJ 08900
Douglas E. Eveleigh
(201) 932-1766

University of Pennsylvania
College of Engineering and Applied
Science
Philadelphia, PA 19174
E. K. Pye
(215) 243-7244
Subject: Biological Production of
Organic Solvents from Cellu-
losic Wastes

University of Toronto
Department of Chemical Engineering
Toronto M5S 1A4 Canada
Morris Wayman
Subject: Ethanol for Motor Fuel from
Biomass

b. Anaerobic Digestion

Bio-Gas of Colorado, Inc.
American National Bank Building
Denver, CO 80202
William Pace
(303) 572-1061
Subject: Bioconversion of Agricultural
Residues

Cornell University
Department of Agricultural Engineering
Ithaca, NY 14853
W. J. Jewell
(607) 256-4533
Subject: Potential of Methane Genera-
tion in Agriculture

Dynatech Research and Development Company
99 Erie Street
Cambridge, MA 02139
(617) 868-8050
Subject: Engineering Evaluation of Pro-
grams to Recover Fuel Gas from
Waste

Ecotope Group
2332 East Madison
Seattle, WA 98112
Kenneth Smith
(206) 322-3753
Subject: Digester Applications for Dairy
Farm Operations

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, GA 30332
(404) 894-3095
Subject: Anaerobic Digestion of Poultry
Manures

Hamilton Standard
Windsor Locks, CT 06096
Robert E. Breeding
(203) 623-1621
Subject: Pipeline Fuel Gas from Experi-
mental Cattle Feedlot

b. Anaerobic Digestion (Continued)

Pacific Gas & Electric Company
245 Market Street
San Francisco, CA 94106
Pablo Maciel
(415) 781-4211

Southern California Gas Company
810 S. Flower Street
Los Angeles, CA 90017
Vince Bendanillo
(213) 689-3421
Subject: Jointly Sponsored Effort by
Above Utilities to Investigate
Feasibility of SNG Production
from Cattle Manure

Sheaffer & Roland, Inc.
20 North Wacker Drive
Chicago, IL 60606
John Martin
(312) 236-9106
Subject: Anaerobic Digesters from
Cattle Waste

Stanford University
Department of Civil Engineering
Palo Alto, CA 94305
Perry L. McCarty
(415) 497-3504
Subject: Methane Production

University of California
Agricultural Engineering Department
Davis, CA 95616
D. J. Hills
(916) 752-7420
Subject: Methane Generation from Crop
and Food Processing Residues

University of Illinois
Civil Engineering Department
Urbana, IL 61801
J. T. Pfeffer
(217) 333-6965
Subject: Biological Conversion of
Biomass to Methane

b. Anaerobic Digestion (Continued)

University of Minnesota
Department of Agricultural Engineering
St. Paul, MN 55108
(612) 373-0764
Phillip Goodrich
Subject: Feasibility Study of Bio-gas
Powered Electric Generator

USDA/AES
229 Agricultural Administration Building
Pennsylvania State University
University Park, PA 16802
J. M. Beattie
(814) 865-2541
Subject: Methane from Manure

USDA/AES
Coastal Plain Station
Tifton, GA 31794
E. B. Browne
(912) 386-3338
Subject: Farm Manures

USDA/AES
College of Agricultural & Environmental
Sciences
University of California
Davis, CA 95616
C. E. Hess
(916) 752-1605
Subject: Manure Conversion Study

USDA/AES
Colorado State University
Fort Collins, CO 80523
J. P. Jordan
(303) 491-5371
Subject: Manure Conversion Study

b. Anaerobic Digestion (Concluded)

USDA/AES
College of Tropical Agriculture
University of Hawaii
2545 The Mall
Honolulu, Hawaii 96822
W. R. Furtick
(808) 948-8234
Subject: Bioconversion of Organic Wastes

USDA/AES
University of Illinois
Urbana, IL 61801
G. W. Salisbury
(217) 333-0240
Subject: Methane Production

USDA/ARS
Northern Regional Research Center
1815 North University
Peoria, IL 61604
Dwight Miller
(309) 685-4011
Subject: Methane from Manure

USDA/ARS
University of Missouri
Columbia, MO 65201
James R. Fischer
(314) 882-8337
Subject: Develop Methods of Equipment
for On-farm Anaerobic Digestion
of Agricultural Research

USDA/ARS
P. O. Box 166
Clay Center, NE 68933
G. Hashimoto
(402) 762-3241
Subject: Anaerobic Digestion of Livestock
and Crop Residue

II. RECIPIENTS OF INFORMATION

A. Federal Agencies*

Agency for International Development
320 21st Street, NW
Washington, DC 20520
Alan Jacobs
(202) 632-9884

Agriculture, Department of
Office of Energy - Room 3812
State Agriculture Building
Washington, DC 20250
Harry Brown Energy Coordinator
(202) 447-4515

Agriculture, Department of
Room 219, Building 005
BARC-West
Beltsville, MD 20705
Landy Altman, Energy Research
Coordinator
(301) 344-2740

Commerce, Department of
National Oceanic and Atmospheric
Administration
Office of Ecology and Conservation
Washington, DC 20230
Richard L. Lehman
(202) 377-5181

Defense, Department of
Energy Office
Office of the Secretary
The Pentagon
Washington, DC 20301
Walter Christianson
(202) 545-6700

*Most Federal agencies are also good sources of information in specialized areas of biomass development.

A. Federal Agencies (Continued)

Energy, Department of
Division of Transportation Energy Conservation
Washington, DC 20545
Eugene Ecklund, Chief
Alternative Fuels Utilization Branch

Energy, Department of
Office of Public Affairs
Washington, DC 20585
Jim Bishop, Director
(202) 376-5729

Environmental Protection Agency
401 M Street, NW
Washington, DC 20460
Kurt Jacobson
(202) 755-9014

Environmental Quality, Council on
722 Jackson Place, NW
Washington, DC 20006
John Davidson
Staff Member for Energy Programs
(202) 633-7097

National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418
Philip Ross
(202) 389-6116

National Science Foundation
Advanced Energy & Resources Technology
1800 G Street, NW
Washington, DC 20007
Oskar Zaborsky
(202) 632-7398

State, Department of
International Energy R&D
IESNETIM
Washington, DC 20540
Martin Prochnik
(202) 632-4413

A. Federal Agencies (Concluded)

Transportation, Department of
Office of Energy Policy
400 Seventh Street, SW
Washington, DC 20590
Don Igo
(202) 426-0783

USDA/Extension Service
Room 5039
South Agriculture Building
12th and Independence Ave. SW
Washington, DC 20250
Neil Schaller
(202) 447-3377

USDA/Forest Products & Energy Research
Room 3836
South Agriculture Building
Washington, DC 20250
John Erickson, Research Engineer
(202) 447-5653

USDA/Forest Service
Timber Management Research
Room 811-RPE
P.O. Box 2417
Washington, DC 20013

United States Information Agency
Science & Technology Division
1776 Pennsylvania Avenue, NW
Washington, DC 20547
(202) 655-4000

Agriculture, Department of
Secretary's Office
Administration Building
Room 226-E
Washington, D.C. 20250
Weldon Barton, Director of Energy
(202) 447-2455

B. State Agencies

Energy Offices

Alabama, State of
Alabama Energy Board Management
Alabama Development Office
State Capitol
Montgomery, AL 36130
Edwin G. Hudspeth
(205) 832-5010

Alaska, State of
Alaska Energy Office
Division of Energy & Power Development
Department of Commerce & Economic
Development
7th Floor, McKay Building
Anchorage, AK 99501
William C. McConkey
(907) 272-0527

American Samoa
Government of American Samoa
Pago Pago, A.S. 96799
Ray Coston
Special Assistant to the Governor
9-976-1221: ask for 633-4116

Arizona, State of
Energy Program Section
Capitol Tower, Room 507
Phoenix, AZ 85007
James Warnock
(602) 271-5371

Arkansas, State of
960 Plaza West
Little Rock, AR 72205
Mack B. Woodward
State Energy Coordinator
(501) 371-1374

California, State of
Energy Resources Conservation & Develop-
ment Commission
1111 Howe Avenue
Sacramento, CA 95825
Richard M. Maullin
(916) 322-3690

B. State Agencies (Continued)

Colorado, State of
Office of the Governor
State Capitol
Denver, CO 80203
Patsy Reycraft
Fuel Allocation Officer
(303) 892-2507

Connecticut, State of
Department of Planning and Energy
Policy
20 Grand Street
Hartford, CT 06115
Sister Claire Markan
(203) 566-2800

Delaware, State of
Townsend Building
Dover, DE 19901
David L. Press
Assistant to the Governor on
Energy Affairs
% Secretary of State
(302) 678-5644

District of Columbia
Office of Emergency Preparedness
300 Indiana Avenue, NW, Room 5009
Washington, DC 20001
George R. Rodericks
(202) 629-5151

Florida, State of
State Energy Office
108 Collins Building
Tallahassee, FL 32304
Dr. Carlos Warren
(904) 488-6764

Georgia, State of
Georgia State Office of Energy Resources
Room 615
270 Washington Street, SW
Atlanta, GA 30334
(404) 656-3874

B. State Agencies (Continued)

Guam
Guam Energy Office
Office of the Governor
Government House
Agana, Guam 96910
Paul B. Souder
9-967-1221: ask for 477-9502

Hawaii, State of
State Department of Planning and
Economic Development
Kamamalu Building
P.O. Box 2359
Honolulu, HI 96804
Hideto Kono
8-556-0220: ask for (808) 548-3033

Idaho, State of
Idaho Office of Energy
State House
Boise, ID 83720
L. Kirk Hall
(208) 384-3132

Illinois, State of
Energy Department of Business and
Economic Development
222 South College
Springfield, IL 62706
Marvin Nodiff
(217) 782-7500

Indiana, State of
Indiana Energy Office
803 State Office Building
Indianapolis, IN 46204
William Sorrells
(317) 633-6753

Iowa, State of
Energy Policy Council
707 East Locust Street
Des Moines, IA 50319
Rodson Riggs
FTS: 863-4420

B. State Agencies (Continued)

Kansas, State of
State Energy Office
503 Kansas Avenue, Room 241
Topeka, KS 66603
Stephen D. Harris
(913) 296-2496

Kentucky, State of
Kentucky Department of Energy
Capitol Plaza Towers
Frankfort, KY 40601
Damon W. Harrison
(502) 564-7416

Louisiana, State of
Department of Conservation
P.O. Box 44275
Baton Rouge, LA 70804
Raymond J. Sutton
(504) 389-5161

Maine, State of
Office of Energy Resources
55 Capitol Street
Augusta, ME 04330
Gary R. Linton
(207) 289-2196

Maryland, State of
Energy Policy Office
301 West Preston Street
Suite 1302
Baltimore, MD 21201
John P. Hewitt
(301) 383-6810

Massachusetts, State of
Massachusetts Energy Policy Office
John W. McCormick Building
Room 1413
1 Ashburton Place
Boston, MA 02108
Henry Lee
(617) 727-4732

B. State Agencies (Continued)

Michigan, State of
Michigan Energy Administration
4th Floor, Law Building
Lansing, MI 48913
Gene Hedges
(517) 373-8250

Minnesota, State of
Minnesota Energy Agency
740 American Center Building
150 East Kellogg Boulevard
Saint Paul, MN 55101
John P. Millhone
(612) 296-5120

Mississippi, State of
Mississippi Fuel and Energy Management
Commission
Room 1307
Woolfolk State Office Building
Jackson, MS 39202
Director
(601) 354-7406

Missouri, State of
Missouri Energy Agency
P.O. Box 1309
Jefferson City, MO 65101
Weston A. Fisher
(314) 751-4000

Montana, State of
Fuel Allocation Officer
Capitol Station
Helena, MT 59601
John C. Braunbeck
(406) 449-2860

Nebraska, State of
State Energy Office
P.O. Box 95085
Lincoln, NE 68509
George J. Dworak
(402) 471-2867

B. State Agencies (Continued)

Nevada, State of
Public Service Commission
505 East King Street
Carson City, NV 89710
Noel Clark
(702) 885-4180

New Hampshire, State of
Governor's Council on Energy
3 Capitol Street
Concord, NH 03301
Marshall Cobleigh
(603) 271-2121

New Jersey, State of
Department of Energy
101 Commerce Street
Newark, NJ 07102
(201) 648-3290

New Mexico, State of
Energy Resources Board
P.O. Box 2770
Santa Fe, NM 87501
Fred O'Cheskey
(505) 827-2472

New York, State of
State Energy Office
Empire State Plaza
Swan Street Building
Core 1, Floor 2
Albany, NY 12223
James L. Larocca
(518) 474-2870

North Carolina, State of
Energy Division
215 East Lane Street
Raleigh, NC 27611
Brian Flattery
(919) 733-2230

B. State Agencies (Continued)

North Dakota, State of
Office of the Governor
State Capitol
Bismarck, ND 58501
Dr. T. Dwight Connor
(701) 224-2200

Ohio, State of
Ohio Energy and Resource Development
Agency
30 East Broad Street
25th Floor
Columbus, OH 43215
Robert S. Ryan
(614) 466-8102

Oklahoma, State of
Department of Energy
4400 North Lincoln Boulevard
Suite 251
Oklahoma City, OK 73105
Richard G. Hill
(405) 521-3941

Oregon, State of
Oregon Department of Energy
528 Cottage Street, NE
Salem, OR 97310
Dr. Fred D. Miller
(503) 378-4128

Pennsylvania, State of
Governor's Energy Council
905 Payne-Shoemaker Building
Harrisburg, PA 17101
William B. Harral
(717) 787-9749

Puerto Rico
Puerto Rico Energy Office
P.O. Box 13934
Santurce, PR 00908
Frank Castellon
(809) 726-4740

B. State Agencies (Continued)

Rhode Island, State of
State Energy Office
State House
Providence, RI 02903
Dante Ionata
(401) 277-3370

South Carolina, State of
Energy Management Office
Edgar A. Brown Office Building
1205 Pendleton Street
Columbia, SC 29201
Steve Connor
(803) 758-2050

South Dakota, State of
Energy Policy Office
Joe Foss Building
Pierre, SD 57501
James A. Van Loan
(605) 224-3603

Tennessee, State of
Tennessee Energy Office
250 Capitol Hill Building
Nashville, TN 37219
Edward J. Spitzer
(615) 741-2994

Texas, State of
7703 North Lamar
Austin, TX 78752
Alvin E. Askew
Assistant to the Governor for Energy
Resources
(512) 475-5491

Utah, State of
Department of Natural Resources
438 State Capitol
Salt Lake City, UT 84114
(801) 533-5356

B. State Agencies (Continued)

Vermont, State of
State Energy Office
State Office Building
Montpelier, VT 05602
Brendan Whittaker
(802) 828-2768

Virginia, State of
Virginia Energy Office
823 East Main Street
Room 300
Richmond, VA 23219
Louis R. Lawson, Jr.
(804) 786-8451

Virgin Islands
Virgin Islands Energy Office
Office of Budget Director
P.O. Box 90
Saint Thomas, VI 00801
Bruce Potter
(809) 774-0750

Washington, State of
Washington Energy Office
1000 South Cherry Street
Olympia, WA 98504
Lawrence B. Bradley
(206) 753-2417

West Virginia, State of
Fuel and Energy Office
1262 ½ Greenbrier Street
Charleston, WV 25311
John D. Anderson III
(304) 348-8860

Wisconsin, State of
Office of State Planning and Energy
Room B130
1 West Wilson Street
Madison, WI 53702
Vicki Potter
(608) 266-3382

B. State Agencies (Concluded)

Wyoming, State of
Department of Economic Planning and
Development
Barrett Building
Cheyenne, WY 82002
John P. Goodier
(307) 777-7284

C. Trade Associations*

American Association of Cereal Chemists, Inc.
8340 Pilot Knob Road
St. Paul, MN 55121
Raymond J. Tarleton
(612) 454-7250

American Dairy Association
6300 North River Road
Rosemont, IL 60018
Alden G. Grimes
(312) 696-1880

American Paper Institute, Inc.
260 Madison Avenue
New York, NY 10016
Jeffrey Duke
(212) 883-8000

American Pulpwood Association
1619 Massachusetts Avenue, NW
Washington, DC 20036
(202) 265-0670

Canada Grains Council
400-177 Lombard Avenue
Winnipeg, Manitoba
Canada R3B 0W5
Donald A. Dever
(204) 942-2254

Council of State Chambers of Commerce
Room 1018
1028 Connecticut Avenue, NW
Washington, DC 20036
(202) 296-2630

Farmer's Educational & Cooperative Union of
America
12025 East 45th Avenue
Denver, CO 80251
(303) 371-1760

*A complete listing of trade associations with additional information may be had by consulting "The National Trade and Professional Associations of the United States and Canada and Labor Unions." 13th edition, 1978; Columbia Books, Inc., 734 15th St. NW, Washington, DC 20005.

C. Trade Associations (Continued)

Forest Industries Council*
1619 Massachusetts Avenue, NW
Washington, DC 20036
George C. Cheek
(202) 667-7807

Forest Products Research Society
2801 Marshall Court
Madison, WI 53705
Arthur B. Brauner
(608) 231-1361

Grain Sorghum Producers Association
1708-A 15th Street
Lubbock, TX 79401
Elbert Harp
(806) 763-4425

National Association of County Agricultural Agents
180 Milan Avenue
Norwalk, OH 44857
John K. Wells
(419) 744-2334

National Association of Real Estate Brokers, Inc.
1025 Vermont Avenue, NW
Washington, DC 20005
Johnson T. McClurkin
(202) 638-7521

National Association of Wheat Growers
1031 15th Street, NW
Washington, DC 20005
Jerry Rees
(202) 466-8630

National Cattlemen's Association
Box 569
1001 Lincoln Street
Denver, CO 80201
George S. Spencer
(303) 861-1904

*Policy Making Federation of Nine Associations

C. Trade Associations (Continued)

National Forest Products Association
1619 Massachusetts Avenue, NW
Washington, DC 20036
Ralph D. Hodges, Jr.
(202) 797-5800

National Grange
1616 H Street, NW
Washington, DC 20006
(202) 628-3507

National Potato Council
Montebello Office Campus
45th & Peoria
Denver, CO 80239
(303) 373-5639

National Recreation & Park Association
1601 North Kent Street
Arlington, VA 22209
(703) 525-0606

National Rural Electric Cooperative
Associations
2000 Florida Avenue, NW
Washington, DC 20009
(202) 265-7400

National Solid Wastes Management Association
Suite 930
1120 Connecticut Avenue, NW
Washington, DC 20036
(202) 659-4613

National Sugarbeet Growers Federation
Greeley National Plaza
Greeley, CO 80631
(303) 352-6875

Newspaper Farm Editors of America
4200 12th Street
Des Moines, IA 50313
(515) 243-4518

C. Trade Associations (Continued)

Pacific Logging Congress
217 American Bank Building
Portland, OR 97205
(503) 228-7971

Process Equipment Manufacturers Association
P.O. Box 8745
Kansas City, MO 64114
(913) 642-3114

Pulp Chemicals Association
60 East 42nd Street
New York, NY 10017
(212) 697-4816

Pulp & Paper Manufacturers Association
1001 Connecticut Avenue, NW
Washington, DC 20036
(202) 785-4185

Pulp, Paper & Woodworkers of Canada
448 Seymour Street
Vancouver, British Columbia V6B 3H3
(604) 687-8591

Society of Wood Science and Technology
Box 50 62
Madison, WI 53705
(608) 257-2211

Southern Forest Products Association
Box 52468
New Orleans, LA 70152
(504) 834-8544

Technical Association of the Pulp & Paper
Industry (TAPPI)
1 Dunwoody Park
Atlanta, GA 30341
Herbert Teeple
(404) 394-6130

C. Trade Associations (Concluded)

Timber Products Manufacturers
951 East Third Avenue
Spokane, WA 99202
(509) 535-4646

D. Utilities*

Edison Electric Institute
1015 18th Street, NW
Washington, DC 20036
Glenn H. Lovin
(202) 223-1265

Electric Power Research Institute
P.O. Box 10412
Palo Alto, CA 94303
(415) 855-2498

Gas Research Institute
10 W. 35th Street
Chicago, IL 60616
Ab Flowers
(312) 567-6606

Institute of Gas Technology
3424 S. State Street
IIT Center
Chicago, IL 60616
(312) 567-3650

Southern California Edison Company
2244 Walnut Grove
Rosemead, CA 91770
(213) 699-0211

United Gas and Pipeline Company
R&D Department
P.O. Box 1478
Houston, TX 77001
Daniel Berkey
(713) 237-4123

*A number of utilities have projects in biomass conversion to electricity. Their names can be obtained by contacting the Electric Power Research Institute, Palo Alto, CA.

E. Industry*

1. Forest Products

Black Clawson
P.O. Box 1028
Everett, WA 98206
(206) 258-3555

Bowater, Incorporated
Old Greenwich, CN 06870

Canadian International Paper
Sun Life Building
Montreal, Quebec
Canada H3B 2X1

Champion International
One Landmark Square
Stamford, CN 06921
(203) 357-8500

Container Corporation of America
1 First National Plaza
Chicago, IL 60670
(312) 786-5500

Crown Zellerbach Canada Ltd.
815 West Hastings Streets
Vancouver, Canada
(604) 668-4242

Crown Zellerbach Corporation
One Bush Street
San Francisco, CA 94119

Georgia-Pacific Corporation
900 South West 5th Avenue
Portland, OR 97204

*The following lists include a small sampling of industries which have expressed interest in bio-energy. Many of these industries are also engaged in biomass research, and could be considered sources of information on specialized aspects of bio-energy.

1. Forest Products (Continued)

Great Southern Paper Company
P.O. Box 44
Cedar Springs, GA 31732

Hercules
910 Market Street
Wilmington, DE
(302) 575-5000

International Paper Company
220 East 42nd Street
New York, NY 10017

Koppers Company
Koppers Building
Pittsburg, PA 15219

MacMillan Bloedel
6540 Powers Ferry Road
Atlanta, GA 30339
(404) 955-1324

Masonite Corporation
29 North Wacker Drive
Chicago, IL 60608
(312) 372-5642

Morbark Industries
Winn, MI 48896
William E. Sells
(517) 866-2381

Olinkraft
P.O. Box 488
Jonesboro Highway
West Monroe, LA 71291

Owens-Corning Fiberglas Corporation
Fiberglas Tower
Toledo, OH 43659

1. Forest Products (Concluded)

St. Regis Paper Company
150 East 42nd Street
New York, NY 10017
(212) 967-4400

Scott Paper Company
Scott Plaza I
Philadelphia, PA 19113
(215) 521-5000

Timber Engineering Company
5530 Wisconsin Avenue
Washington, DC 20015
(301) 654-8288

Weyerhaeuser Company
Tacoma, WA 98401
(206) 924-2345

2. Petrochemicals

Allied Chemical Corporation
Columbia Road and Park Avenue
Morristown, NJ 07960
(201) 455-2000

Coyne Chemical Company
Comley Street and Delaware River
Philadelphia, PA 19135
(215) 831-8800

Dow Chemical Company
2030 Dow Center
Midland, MI 48640
(517) 636-1000

E. I. DuPont de Nemours and Company
Central Research and Development Department
Wilmington, DE 19898
Robert M. Busche
(302) 774-1000

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, MO 63166
(314) 694-1000

Union Carbide Corporation
270 Park Avenue
New York, NY 10017
(212) 551-2345

3. Auto/Petroleum

Atlantic Richfield Company
515 S. Flower Street
Los Angeles, CA 90071
(213) 486-3511

British Petroleum North America, Inc.
620 Fifth Avenue
New York, NY 10020

EXXON Corporation
1251 Avenue of the Americas
New York, NY 10020
(212) 398-3000

Fiat Research and Development
One Parklane Boulevard
Parklane Towers West
Dearborn, MI 48126

Ford Motor Company
Fuels Research Division
P.O. Box 2053
Dearborn, MI 48121

General Motors Corporation
Technical Center
Warren, MI 48090
Joseph M. Colucci
(313) 556-5000

Mobil Corporation
150 E. 42nd Street
New York, NY 10017
(212) 883-4400

Occidental Research Corporation
1855 Carrion Road
LaVerne, CA 91750
(714) 593-7421

4. Wood Boiler Firms

American Fyr-Feeder Engineers
1265 Rand Road
Des Plaines, IL 60026
(312) 298-0044

Atlas Boiler and Equipment Company
W. 29 Spokane Falls Boulevard
Spokane, WA 99211
(503) 747-6001

Automated Combustion
P.O. Drawer 9
Lake Oswego, OR 97304
(503) 636-4569

Babcock & Wilcox Company
20 S. Van Buren Avenue
Barberton, OH 44203
(216) 753-4511

Bagot (Herman) and Company
3143 N. Nottingham
Chicago, IL 60634
(312) 637-6037

Basic Environmental Engineering, Inc.
21 Hill Street
Glen Ellyn, IL 60137
(312) 469-5340

Bigelow Company
P.O. Box 706
New Haven, CT 06503
(203) 772-3150

Bumstead Woolford Company
P.O. Box 448
Woodinville, WA 98072
(206) 485-9646

Burnham Corporation
P.O. Box 27
Lancaster, PA 17604
(717) 397-4701

4. Wood Boiler Firms (Continued)

Burt Power Inc.
6405 New Tampa Highway
Lakeland, FL 33802
(813) 876-5329

Combustion Engineering, Inc.
900 Long Ridge Road
Stamford, CT 06902
(203) 688-1911

Copeland Systems, Inc.
200 Spring Road, Suite 300
Oak Brook, IL 60521
(312) 654-2820

Detroit Stoker Company
Monroe, MI 48161
(313) 241-9500

Eclipse Lookout Company
P.O. Box 4756
Chattanooga, TN 37405
(615) 265-3441

Energex, Limited
P.O. Box 4208
North Portland, OR 97208
(503) 286-8231

Energy Control Engineering Corporation
P.O. Box 3064
Charlotte, NC 28203
(704) 375-1701

Energy Products of Idaho
P.O. Box 153
Coeur d'Alene, ID 83818
(208) 667-6439

Environmetrix
4725 University Way NE
Seattle, WA 98115
(206) 524-6350

4. Wood Boiler Firms (Continued)

Foster Wheeler Energy Corporation
110 South Orange Avenue
Livingston, NJ 07039
(201) 533-1100

Gaskell Company, Inc.
P.O. Box 13225
Memphis, TN 38113
(901) 775-3222

Harvey Engineering & Manufacturing Corp.
Route 2, Box 478
Hot Springs, AR 71901
(501) 262-1010

Industrial Boiler Company
221 Law Street
Thomasville, GA 31792
(912) 226-3024

International Boiler Company
E. Strousburg, PA 18301
(717) 421-5100

Irrington-Moore Division of USNR
P.O. Box 40666
Jacksonville, FL 32203
(509) 747-7965

Johnston Boiler Company
Ferrvburg, MI 49409
(616) 842-5050

Keeler (E.) Company
238 West Street
Williamsport, PA 17701
(717) 326-3361

Kewanee Boiler Corporation
101 North Franklin Street
Kewanee, IL 61443
(309) 853-3541

4. Wood Boiler Firms (Continued)

Kipper and Sons Engineers, Inc.
2616 Western Avenue
Seattle, WA 98121
(206) 622-4545

Lamb-Grays Harbor Company
Hoquiam, WA 98550
(206) 532-1000

Lasker Boiler & Engineering Corporation
3201 South Wolcott Avenue
Chicago, IL 60608
(312) 523-3700

Marden, Inc.
3129 E. Washington Avenue
Madison, WI 53704
(608) 244-3331

McBurney Corporation
P.O. Box 47848
Atlanta, GA 30362
(404) 448-8144

McConnell Industries, Ltd.
Box 626
Cochrane, Alberta, Canada
(403) 932-2274

Mechanical Equipment Company
7212 Woodlawn Avenue, NE
Seattle, WA 98115
(206) 523-8526

Moore-Oregon-Canada
P.O. Box 4208
Portland, OR 97208
(503) 286-8231

Peabody Engineering Company
Stamford, CT 06900
(203) 327-7000

4. Wood Boiler Firms (Continued)

Peabody Gordon-Piatt, Inc.
Box 650
Winfield, KS 67156
(316) 221-4770

Pyrotechnic Industries, Limited
Box 626
Cochrane, Alberta, Canada
(403) 932-2274

Ray Burner Company
1303 San Jose Avenue
San Francisco, CA 94112
(415) 333-5800

Riley Stoker Company
9 Neponset Street
Worcester, MA 01613
(617) 852-7100

Rogers (John) Company
4605 Illinois Avenue
Louisville, KY 40213
(502) 458-5400

Seattle Boiler Company
5237 Marginal Way
Seattle, WA 98134
(206) 762-0737

Smith (Perry) Company, Inc.
P.O. Box 21282
Chattanooga, TN 37421
(615) 982-7130

Stearns-Roger, Inc.
P.O. Box 5888
Denver, CO 80217
(303) 758-1122

Steel Craft Corporation
Box 12408
Memphis, TN 38112
(901) 452-5200

4. Wood Boiler Firms (Concluded)

Vogt (Henry) Machine Company
P.O. Box 1918
Louisville, KY 40201
(502) 634-9411

Woodamation, Inc.
P.O. Box 1365
Chalmette, LA 70044
(504) 279-1010

Wyatt Engineers, Inc.
3214 16th Avenue, SW
Seattle, WA 98134
(206) 682-2501

York-Shipley, Inc.
P.O. Box 349
York, PA 17405
(717) 755-1081

Zurn Industries, Inc.
2214 West 8th Street
Erie, PA 16512
(814) 455-0921

5. Other Industries*

J. P. Stevens
Box 2850
Greenville, SC 29602

National Realty Committee
2033 M Street, NW
Washington, DC 20036

Textile Workers Union of America
AFL/CIO - Engineering Department
99 University Place
New York, NY 10003

Corning Glass Works
Sullivan Park
Corning, NY 14830

Grumman Ecosystems Corporation
1111 Stewart Avenue
Bethpage, NY 11714

Pratt and Whitney
Florida Research & Development Center
West Palm Beach, FL 33402

IBM
1000/3000 Westchester Avenue
White Plains, NY 10604

United Technologies
P.O. Box 109
South Windsor, CN 06074

Leeds and Northrup Company
Dickerson Road
North Wales, PA 19454

American Can Corporation
P.O. Box 50
Princeton, NJ 08540

*Listed here is a sampling of industries which have
shown an interest in bio-energy development.

F. Agriculture

1. Producers and Processors

Amstar Corporation
1251 Avenue of the Americas
New York, NY 10020

Arizona Feeds
P.O. Box 5526
Tuscon, AZ 85703

DeKalb Agricultural Research
Sycamore Road
DeKalb, IL 60115

General Compost Corporation
322 South 16th Street
Philadelphia, PA 19102

General Mills Inc.
9200 Wayzata Boulevard
Minneapolis, MN 55440

Grace (W.R.) and Company
Agricultural Chemicals Group
P.O. Box 27147
Memphis, TN 38127

Kellog Company
235 Porter Street
Battle Creek, MI 49016

Nabisco Company
River Road & DeForest Avenue
East Hanover, NJ 07936

Oscar Mayer and Company
Industrial Products and Processes Research
P.O. Box 1409
Madison, WI 53701

The Pillsbury Company
401 Second Street, SE
Minneapolis, MN 55414

1. Producers and Processors (Concluded)

Quaker Oats Company
Merchandise Mart Plaza
Chicago, IL 60654

Ralston Purina Company
835 S. Eighth Street
St. Louis, MO 63102

2. Machinery/Manufacturers

Allis-Chalmers Corporation
1205 South 70th Street
Milwaukee, WI 53201

Caterpillar Tractor Company
Marketing Department
100 N.E. Adams Street
Peoria, IL 61629

Deere and Company
John Deere Road
Moline, IL 61265

International Harvester
401 N. Michigan Avenue
Chicago, IL 60611

G. Alternative Energy Information Organizations*

American Association for The Advancement of Science
1515 Massachusetts Avenue, NW
Washington, DC 20036
Allen Hammond
(202) 467-4351

Conservation Foundation
1717 Massachusetts Avenue, NW
Washington, DC 20036
Russell E. Train
(202) 797-4370

Maine Audubon Society
Gilsland Farm
118 Route 1
Falmouth, ME 04105
(207) 781-2330

National Wildlife Federation
1412 Sixteenth Street, NW
Washington, DC 20036
Thomas L. Kimball
(202) 797-6800

Overseas Development Council
1717 Massachusetts Avenue, NW
Washington, DC 20036

RAIN
2270 NW Irving Street
Portland, OR 97210
Lee Johnson
(503) 227-7225

Resources for the Future
1755 Massachusetts Avenue, NW
Washington, DC 20036
(202) 462-4400

The Rodale Press
Organic Park
Emmaus, PA 18049
(215) 967-9171

*A comprehensive listing of organizations and officials concerned with natural resource use and management can be found in the Conservation Directory, 23rd Edition, published by the National Wildlife Federation.

G. Alternative Energy Information Organizations (Concluded)

Sierra Club
324 C Street, SE
Washington, DC 20003
Greg Thomas
(202) 547-1144

Volunteers in Technical Assistance
3706 Rhode Island Avenue
Mt. Rainier, MD 20822
(301) 277-7000

Worldwatch Institute
1776 Massachusetts Avenue, NW
Washington, DC 20036
Dennis Hayes
(202) 452-1999

H. International Organizations*

Center for National Resources, Energy and
Transportation
United Nations
New York, NY 10017
Howard Brand
(212) 754-8773

Food and Agriculture Organization of the
United Nations
1776 F. Street, NW
Washington, DC 20437
Donald C. Kimmell
(202) 634-6200

Inter-American Development Bank
808 17th Street, NW
Washington, DC 20577
Ismael Escobar
(202) 634-8000

Organization of American States
1735 I Street, NW
Washington, DC 20006
Marcello Alonso
(202) 331-1010

United Nations Environmental Program
United Nations
Room LX-1222
New York, NY 10017
Ishrat Usmani

*Scientific and/or Commercial attaches of all Embassies
should be recipients.

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