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**NORTHEAST REGIONAL BIOMASS ENERGY PROGRAM
QUARTERLY REPORT - 9TH YEAR
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INTRODUCTION

The Northeast Regional Biomass Program (NRBP) is entering its ninth year of operation. The management and the objectives have virtually remained unchanged and are stated as follows.

Management

The program conducted by NRBP has three basic features: 1) a state grant component that provides funds (with a 50 percent matching requirement) to each of the states in the region to strengthen and integrate the work of state agencies involved in biomass energy; 2) a series of technical reports and studies in areas that have been identified as being of critical importance to the development of biomass energy in the region; and 3) a continuous long range planning component with heavy private sector involvement that helps to identify activities necessary to spur greater development and use of biomass energy in the Northeast.

The state grant program provides states with an opportunity to strengthen and integrate the work of energy, forestry, air quality and other appropriate offices in promoting biomass energy use. Most state efforts to promote biomass energy have been fragmented among a wide range of agencies involved in various aspects of this energy source. The state grant projects require interagency cooperation and fall into several general categories: industrial conversion assistance; resource availability and use assessments; technical information development and dissemination; and conversion of state facilities.

The second element of the regional subprogram is a series of subcontracts for the production of reliable information and technical reports focusing on issues identified by the subprogram's Steering Committee and other experts in the region as being of particular importance to the development of biomass fuels in the region. These projects focus on a wide range of issues, including development and dissemination of technical, economic and environmental information of industrial wood energy use, assessment and mitigation of the environmental impacts of wood energy development, and economic analysis of biomass energy in the region. Profit, not-for-profit, university and other organization are eligible for these subcontracts, which are awarded on a competitive basis.

The active involvement of state officials in the formulating of topics for subcontracts helps to insure that the work produced under the technical subcontracts will be valuable to the state programs of the region. Cooperation between subcontractors and state officials will be built into the subcontract and grant agreements in areas such as information gathering and dissemination, workshops and publication preparation. In addition, other biomass energy experts (many from the private sector) will be actively involved in the program by serving on the Technical Advisory Committee or on the oversight committees that have been formulated for several of the subcontracts and grant programs.

Objectives

- Improve the effectiveness, coordination and planning capabilities of the state agencies in the region which have biomass-related responsibilities.
- Assess the availability of biomass energy resources.
- Provide reliable information to private companies, residential and commercial consumers, and public institutions about the potential and versatility of biomass energy sources.
- Better understand and mitigate the environmental impacts of increased biomass energy use without stifling the region's ability to take advantage of its most abundant indigenous energy source.
- Transfer the results of government-sponsored and private research and development to the private sector.
- Support region-specific and interregional studies of the critical impediments to further development of biomass energy resources.
- Coordinate the regional program with other federal, state and regional efforts to avoid duplication and maximize the effectiveness of NRBP dollars.

A grant for the ninth year in the amount of \$775,000 was received from DOE. Funds were allocated as follows:

Operating	\$156,032
Technical Subcontracts	288,968
State Grants	<u>330,000</u>
	\$775,000

RESEARCH HIGHLIGHTS

The Northeast Regional Biomass Steering Committee selected the following four projects for funding for the ninth year.

- 1) Wood Waste Utilization Conference
 - A contract has been signed with C.T. Donovan Associates to organize and manage the conference.
- 2) Performance Evaluation of Wood Systems in Commercial Facilities
 - A contract has been signed with Commercial Testing and Engineering to conduct the study.

3) Wood Energy Market Utilization Training

- A MOU has been signed with the Northeast Utilization and Marketing Council to conduct a training program for foresters.

4) Update of the Facility Directory

- The Independent Energy Magazine has been contracted to determine if their publication can be adopted for our needs.

MANAGEMENT HIGHLIGHTS

The NRB Program Manager has tendered his resignation effective May 1, 1992. Recruiting a replacement is in process.

The NRB Steering Committee met in Washington, D.C. with Department of Energy Representatives.

Attended the Biomass Combustion Conference in Reno, Nevada on January 28-30, 1992.

STATE GRANTS

Connecticut

The state of Connecticut has signed a contract with RPM Systems, Inc. to conduct a wood use survey of 800 known residential woodburners and a random sample of an additional 1000 homeowners.

The major effort for this coming year will be:

- Identification of barriers or disincentives to the introduction of alternative fuels to Connecticut's transportation sector.
- Identification of programs or incentives which can encourage a cleaner and more diversified mix of fuels in Connecticut's transportation sector and greater use of renewable fuels.
- Development of a mechanism for coordinating policies or programs concerning alternative fuels or vehicles across agency lines.

An interagency committee alternative fuels has been established to conduct in depth review of the various fuels and their potential for the transportation sector.

Delaware

The state of Delaware has revised their proposal for the coming year. The new proposal will focus on the following items.

- Organize and chair a committee of multiple disciplines to address the resource of biomass energy sources as well as potential uses.
- Develop a program to demonstrate to the agricultural community uses of alternate fuel sources.
- Develop a program for greenhouse owners to demonstrate cheap alternate fuel sources specifically focusing on wood chips.
- Organize one field tour to a successful alternate fuel or biomass plant in neighboring states, for potential alternate fuel users in Delaware.
- Develop and organize two workshops to discuss forest management practices and how to utilize selected hardwoods as fuel sources (i.e., chips and fuel wood).

Maine

In 1990, the Energy Planning Division of the Maine State Planning Office, with financial support provided through the CONEG Northeast Regional Biomass Program, undertook a comprehensive study of the wood fired electrical generating industry, its contributions and impacts. The purpose of the study was to document the performance of the biomass energy industry after ten years of growth and operational experience, and to provide information useful to decision makers when considering biomass alternatives in meeting energy needs.

Since 1980, the wood fired electric generating industry has developed from a few cogenerators producing electricity and process steam mostly for self consumption, to a complex of twenty cogeneration and free standing plants capable of providing nearly 500 megawatts of generating capacity to the utility grid.

A copy of this study is attached.

Maryland

The state of Maryland has formally withdrawn from participation in the Regional Biomass Program. This lack of participation was the result of reduction and reorganization of personnel within the Forestry Service.

The Maryland Energy Administration was contacted (Dr. Donald Milsten) to determine if their office would care to participate in the program.

Massachusetts

The Massachusetts Division of Energy Resources (DOER) has four major efforts underway.

Alternative Fuels For Transportation

DOER's program to demonstrate alternative fuels for transportation continues to broaden and make progress.

DOE has awarded a grant to DOER amending to the State Energy Conservation Program and funding the purchase of three original-equipment-manufacture CNG-fueled school buses for the Town of Weston. These would be the first OEM vehicles (as opposed to conversions) under the Commonwealth's alternative fuels program.

A vendor has come forward offering an opportunity to test biomass-derived fuel. We are exploring its potential.

Fuelwood Promotion Program

A meeting was held in Springfield on March 2nd to start the program, titled "Residential Woodstoves: Lessons Learned." Present were representatives from the vendor, Kelleher-Samets of Burlington, VT, DOER, the Division of Forests and Parks (DFP), TDC and NYSERDA. K-H presented their plan, which included public service announcements, instructional videos and brochures. Publicity was also discussed including an "Old Stove Amnesty Day."

Cogeneration at State Facilities

The Division of Forests and Parks is undertaking a study reviewing the availability and quality of wood fuel in the Amherst area. The results are to be used in a further push to restore the potential of using wood as a fuel in the University of Massachusetts - Amherst cogeneration project.

New Woodburning Power Plant

DOER has provided assistance to Kenetech Energy Systems, Inc., developers of woodburning power plants in Westminster and Brockton, MA. A meeting was arranged with the Division of Forests and Parks and the Program Manager for a tree-planting program know as "Mass Releaf" to determine the offset requirements for these plants. Also, DOER is providing a letter of support confirming the beneficial effect of a waste wood power plant in terms of Greenhouse Warming Tendencies.

New Hampshire

A number of administrative changes have taken place in New Hampshire. The Governor's Energy Office has merged with the Office of Human Services to become the Office of Energy and Community Services (ECS). With Barri-Lynn Mederios departure, Norwood H. Keeney III was appointed as her replacement.

Preparations for the yearly residential fuel survey are underway. Some of the questions of the survey may be updated as ultimately useful to the survey. Examples of new questions being considered related to wood cost and wood stove purchase dates.

The latter would be important given recent Environmental Protection Agency emission guidelines for new woodstoves. The results of the 1991 survey appeared in Yankee Oilman and in the ECS newsletter and were printed in numerous newspapers.

The development of a fuel management program for biomass facilities continues to be discussed by the Independent Power Producers with the encouragement of the ECS. A proposal is likely to be forthcoming. The expected thrust will be for some technical workshops out of which will come direction for future effective programs. The common needs along with technical considerations among the wood fired plants are not now known and, hence, this next phase is logical in this program's evolution. There also seems to be a need for better understanding with regard to the nature of the wood material itself. Thus, some specific scientific research may also be in order.

New Jersey

The number of wood waste processing facilities has increased dramatically in recent years. These businesses in New Jersey processing used pallets, secondary wood residues, clean demolition material, whole tree chips and tree stumps are now located throughout the state. As a continuing effort through project activity were work with these businesses in locating and developing market opportunities for their groundwood products. These outlets address all opportunities available including energy feedstock supplies. A proposal for what could be New Jersey's first commercial wood fired power production facility is under consideration at this time. The facility is designed to generate 21 megawatts of electricity using ground stumpwood fines to fuel the system. Proposed for completion in 1994 the operation will not only be the most significant application of wood energy technology in our state but it also representant a solution to a continuing and growing problem in our state -- productive use for wood that does not belong a s component of our solid waste stream. This commercial wood power proposal has progressed further along than any other similar New Jersey proposal in the past.

New York

As a result of a solicitation by NYSERDA, a contract was signed with Kelligher/Samets Marketing Communications for \$143,000. The purpose of this contract is to increase awareness of and interest in the new generation of EPA-certified wood stoves and their proper operation and maintenance among current wood stove owners, prospective owners and the people who sell and service them in 11 northeastern states. The objectives are to:

- educate the target audience about the benefits of wood heat, and for those people with a predisposition to heating with wood, offer tips on buying a wood stove;
- persuade owners of pre-EPA wood stoves to exchange them for clean-burning models;
- show owners of wood stoves how to operate and maintain them properly;

- encourage influencer like political leaders to serve as wood heating exemplars; and
- provide wood stove sellers and servicers with the educational tools to influence their prospects and customers.

The contract is jointly funded by Massachusetts, Council of Great Lakes Governors and the CONEG Policy Research Center, Inc.

Pennsylvania

The Warren State Hospital was converted to use sawdust as a fuel. The installation cost \$3.5 million and is expected to save the state \$350,000 to \$500,000 annually on fuel costs. The new boiler system was put in operation in December 1991, however has encountered a number of problems. It has been determined that incomplete combustion is occurring; the result being that the byproduct of the sawdust process is a substance similar to "a condensed charcoal," instead of ash. The contractor is currently monitoring and evaluating the problem so as proper adjustments can be made so it meets the standards of the contract.

Rhode Island

Rhode Island is in the process of undertaking a study of anaerobic digestion and in-vessel composition option. An RFP was issued and seven proposals were received. Selection of a contractor in process.

Rhode Island also has a project underway to "Research and Identify Markets for Recycled Construction and Wood Waste." Study is expected to be completed in July 1992.

Vermont

The Vermont Department of Public Service has proposed building a 20-megawatt electrical generation plant that would burn waste wood from the Green Mountain Forest. The plant would consume about 100,000 cords a year.

Vermont has been involved in assisting the General Electric Research and Development Laboratory to secure wood chips suitable for use in a fixed bed gasifier/gas-turbine simulator. The fuel-in feed system for the gasifier currently being tested was designed to accommodate crushed coal which shares little in properties with wood chips as commonly available.

After several months of searching for a proper fuel, tests were conducted. The gasifier ran for 85 consecutive hours with no problem.

In March 1992, GE made their formal presentation on the results of the gasification testing. Testing showed that it is increasingly feasible to build a wood-burning power plant in Bennington County.

TECHNICAL SUBCONTRACTS

Regional Biomass Strategies and their Potential to Mitigate the Accumulation of Greenhouse Gases in the Atmosphere

The contractor, Tellus Institute had previously submitted a report which provided (1) the projections of energy use by fuel for the eleven CONEG states, including biomass resources (firewood, MSW, landfill gas) and wood products (paper and pulp, construction); (2) an estimate of the carbon dioxide and methane emissions from all of these activities (including combustion and losses in extraction and distribution); and (3) project the stocks, annual growth, demands, and net annual growth (decline) on the forests, thereby obtaining carbon uptake (or additional releases) to combine with the combustion releases.

The contractor has currently developed energy-related greenhouse gas scenarios for quantitative background -- broad efficiency improvements over time, schematic full cost dispatch (changing the dispatch order to reflect both direct and environmental costs, and perhaps more cogeneration).

- Explored the merits of alternative biomass options -- wood for electricity, wood for sectoral use, MSW and landfill energy options (and recycling), increased forest products, with expanded forest lands and stocks. Selectively compare to alternatives.
- Formulated and documented policy options analyses which included relevant interviews and other document reviews.

The final report has been reviewed and accepted by the Technical Advisory Committee. Publication of the report is scheduled for May 1992.

Wood Waste in the Waste Stream: Characterization and Emission Testing Protocol Development

NYSERDA has signed a contract with Environmental Risk Limited\C.T. Donovan Associates for the amount of \$327,542 for Phase I. The Regional Programs will contribute \$102,000 towards this effort. CONEG will manage the contract for the region.

Since Waste Wood represents a significant portion of the solid waste stream currently being disposed of in landfills and in an increasing number of instances the clean fraction of the waste wood is being collected and combusted for power production. Environmental regulators are reluctant to allow the combustion of waste wood that is contaminated with paints, preservatives, resins, glues, etc. because of the general lack of knowledge regarding potential adverse environmental impacts. The goal of this project is to identify the major contaminants in waste wood and determine air emissions and ash characteristics when the material is combusted in a conventional wood energy system. This knowledge will then serve as the basis for selecting pollution control devices and/or recommending combustion systems operating parameters that minimize adverse impacts.

The project includes an extensive data collection task in eight states in the United States and one Canadian province. Based on the results of the data collection work, a series of laboratory investigations will be used to identify the chemical and physical properties of the contaminants. All information will be reviewed by a Technical Advisory Committee comprised of the sponsors and representatives of the regulatory community, industry trade associates and other interested parties.

The workplan for the project has been reviewed by the Technical Advisory Committee (TAC) and the NRBP Steering Committee. The status of the program was reviewed again by the TAC in December 1991 and NRBP Steering Committee January 1992.

Evaluation of the Performance of Wood Chip Heating Systems in Institutional Buildings

The Northeast Regional Biomass Program issued a Request for Proposal in November for a field evaluation of direct combustion and gasification wood chip or residue systems to determine fuel and capital costs, combustion efficiencies, O&M costs, and overall system performance over a period of at least one full heating system. These costs and benefits would be compared to those of comparably sized units fueled by electricity and oil--or in the case of retrofitted systems, of the pre- and post-conversion costs and benefits.

No less than six systems, at least one of which is wood gasification would undergo a performance analysis. The smallest system would be no smaller than 500,000 BTU's/hr; the largest, no more than 5 million BTU's/hr. The measurements would include the moisture content of the fuel, fuel weight, and energy output. By calibrating changes in the flow rate and temperature of incoming and outgoing water for hot water systems, researchers can determine efficiency in high-fire and standby modes.

At least one of the systems to be evaluated shall be in northern New England, and one should be located in Pennsylvania, New York, or New Jersey. Proposals were due January 10, 1992.

Commercial Testing and Engineering Company was selected by the Technical Advisory Group to conduct the study. Completion date is scheduled for February 1993.

National Biomass Meeting and Woodwaste Conference

The Northeast Regional Biomass Program signed a contract with C.T. Donovan Associates to plan, organize and conduct the 1992 National Biomass Meeting and the Wood Waste Conference. The specific objectives of the conferences are to:

- conduct a national meeting of state biomass coordinators;
- characterize the physical and chemical contents of wood waste that could potentially be used for energy, and to identify non-wood materials that may cause wood waste to be unacceptable as a fuel source;

- identify and address a variety of technical issues affecting the use of wood waste for fuel, such as the ability of wood waste separation, processing, combustion, air emissions, and ash handling equipment to meet acceptable environmental standards; and
- review existing federal and state policies and regulations concerning the use of wood waste for fuel and address whether policy and regulatory trends are consistent with actual knowledge and data concerning wood waste combustion.

The conference will be held in Newton, Massachusetts October 19-22, 1992. Announcements have been given wide distribution and a call for papers has been issued.

TECHNOLOGY TRANSFER

Articles were prepared for the Biologue Magazine.

A Steering Committee meeting was held in Washington, D.C. at the DOE wherein DOE representatives presented their respective programs.

Attended a Biomass Energy Research Association meeting.

Distributed a number of NRBP publications as far as Redding, California and Vancouver, Canada.

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