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NORTHEAST REGIONAL BIOMASS PROGRAM

NINTH YEAR - FOURTH QUARTER REPORT

JULY - SEPTEMBER 1992

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DECEMBER 1992

Prepared for the U.S. Department of Energy under Grant Number DE-FG05-830R21389

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INTRODUCTION

As the Northeast Regional Biomass Program (NRBP) closes its 9th-Year of operation, its operational management and the program's objectives have virtually remained unchanged. They are stated below.

Management

The NRBP operates using three basic features: 1) a state grant program 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) an applied research and technology transfer component, which produces 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 applied research and technology transfer component of the regional program issues a series of subcontracts for the production of reliable information and technical reports focusing on issues identified by the program's Steering Committee and other experts 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 organizations are eligible for these subcontracts, which are generally awarded on a competitive basis through a Request for Proposals (RFP) process.

The active involvement of state officials in formulating the topics for the technical subcontracts helps to insure that the work produced will be valuable to the state programs of the region. Cooperation between subcontractors and state officials is 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) are 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 applied research and technology transfer projects.

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 renewable energy resource.
- 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.

As previously reported, the 9th-Year grant in the amount of $775,000 was received from USDOE. Funds were allocated as follows:

Operating	156,032
Applied Research & Technology Transfer	288,968
State Grants	330,000
	$775,000

The Annual Operating Plan grant application for the 10th-Year (FY1992) was prepared for USDOE in the amount of $785,000, with an actual starting date of 30 September 1992. Funds for this 10th-Year grant were preliminarily programmed as follows:

Operating	$150,000
Applied Research & Technology Transfer	305,000
State Grants	330,000
	$785,000

RESEARCH HIGHLIGHTS

The NRBP Steering Committee selected the following four projects for funding for the 9th-Year. The status report of each project is provided in the **Applied Research and Technology Transfer** section beginning below on Page 11.

1. National Biomass Conference and Exhibition

2. Performance Evaluation of Wood Systems in Commercial Facilities

3. Wood Energy and Recycling Training Course

4. Update of the Facility Directory

The Northeast Regional Biomass Steering Committee has prioritized the following seven projects for funding for the 10th-Year. A final determination was made at the July 1992 Steering Committee meeting to support the following projects:

1. Field Measurements of Air Toxics from Wood Stoves

2. Identifying and Overcoming the Impediments to Landfill Gas-to-Energy Recovery Projects

3. A Decisions-Makers Guide to the Use of Wood Chips for the Institutional, Commercial and Industrial Markets

4. Wood Stove Manufacturers Workshop on Durability Issues

5. A Regional Wood Pellet Forum

A RFP process will be initiated for Projects 1 through 3, beginning in the 1st quarter of 10th-Year. Project 4 will be issued as a sole-source contract to Omni Environmental Services in Beaverton, Oregon. Omni was the developer of the "stress-testing" protocol, in conjunction with funding from the U.S. Environmental Protection Agency and the NRBP. An additional project, *Stack Testing of Representative Wood Waste Boilers*, which is a Phase II follow-up the *Wood Waste in the Waste Stream* project has been tabled until the implications of Phase I efforts of fully understood. The NRBP has formed a Special Advisory Panel of five Steering Committee members to select one or two additional projects for funding in 10th-Year. A membership roster of the Special Advisory Panel is attached in the Appendix. It is anticipated final selections will be made during the 2nd-quarter (January 1993). A detailed description of 10th-Year projects will begin with the 1st-quarter's report.

MANAGEMENT HIGHLIGHTS

The NRBP Steering Committee met in Boston, Massachusetts in July. A list of Attendees is attached in the Appendix.

Made a presentation on the NRBP at the July meeting of the New England Energy Task Force, which is sponsored by the USDOE Boston Support Office.

Attended a technical review meeting on the prospects for using waste cellulose as a feedstock for ethanol in Connecticut. The presentor was Amoco Corporation, which recently signed a Cooperative Research and Development Agreement (CRADA) with the USDOE.

Attended a financial review meeting with the Delaware state contact and related fiscal officers to discuss current state grant status.

Attended the New York State "roundtable" on wastewood processing and combustion for fuel.

Attended a review meeting on the status of a proposed 20-megawatt biomass gasification steam injection turbine in Vermont.

Participated in several meetings regarding the Regional Biomass Energy Program process evaluation being conducted for the USDOE by the Oak Ridge National Laboratory.

Attended the *1992 Greenhouse Gas Emissions and Mitigation Research Symposium*, sponsored by the U.S. Environmental Protection Agency. A review of the NRBP wood stove projects was presented.

Attended the Annual Meeting of the National Association of State Energy Officials (NASEO).

Attended the Annual *Energy Programs Managers Conference*, sponsored by the USDOE.

Updated the NRBP brochure and contact listing to include USDOE Regional Support Offices. A copy of the brochure is provided in the Appendix.

An **Announcement of Grant Availability** was mailed to each state contact to advise them of the anticipated release of 10th-Year State Grant funds. A copy of the **Announcement** is provided in the Appendix.

STATE GRANTS

Connecticut

The state of Connecticut has assumed four specific tasks, all aimed at facilitating the use, as appropriate, of the alternative fuels identified by the 1990 Clean Air Act Amendments as clean fuels. The four tasks are:

- Determine where the alternative fuels can make a significant impact on the fuel mix of Connecticut's transportation sector.
- Identify the barriers to the utilization of these fuels.
- Develop proposals to address these barriers.
- Propose goals (a timetable and percentages) for the introduction of alternative fueled vehicles in Connecticut.

The Interagency Committee on Alternative Fuels has been established to conduct in depth review of the various fuels and their potential for the transportation sector. The work of the Committee has been divided into two subgroups: a Subcommittee on Regulatory Barriers and a Working Group on State Vehicles. A concern with respect to the use of ethanol is developing around the issue of elevated NOx emissions in summer months. This concern may constrain the interest in the use of E85 in non-compliance areas of the Northeast, such as Connecticut, and also tends to dampen the state's interest in producing ethanol from low-grade waste paper or wood. A strong interest has developed in the use of biodiesel as an alternative fuel option for buses or large trucks.

Delaware

In the past quarter, the primary and secondary wood processor's directories for Delaware have been completed and printed. The directories are now being distributed to the public. Further, the directories are being entered into the U.S. Forest Service's F.I.N.D. (Forest Industry Data) System. This system promotes the exchange of forest industry data on a national level, thus increasing the marketability of Delaware's wood products.

The Delaware Biomass Utilization Work Group meetings continue to be held with the Delmarva Power & Light Corporation, the Delaware Solid Waste Authority, and the University of Delaware Cooperative Extension Service to help assess the potential uses, potential problems, and possible demonstration and study projects from biomass.

Work continues on a U.S. Forest Service focus funding grant whereby the water from a poultry processing plant will be spread on a loblolly pine plantation. It is hoped that the actual field application will begin within the year.

Maine

In 1990, the Energy Planning Division of the Maine State Planning Office, with financial support provided by the NRBP, 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. The report is currently being revised and edited for final publication and distribution.

Maine has also developed a response to the USDOE Notice of Intent entitled *Economic Development through Biomass Applications*. The proposed project, if funded, will involve Central Maine Power Co., the Maine Forest Service, and the College of Forest Resources at the University of Maine. The state biomass program will provide overall project management and coordination.

The state biomass program also reports an increased interest and requests for information about wood energy and wood burning advice. The state biomass program arranged and hosted a meeting of biomass energy plants for Michael Reed of the USDOE-Office of Solar Energy Conversion, as well as making a presentation on biomass energy use to the New England Energy Task Force sponsored by the USDOE-Boston Support Office.

Maryland

As previously reported, Maryland is not currently participating in the Regional Biomass Program as a result of reduction and reorganization of personnel within the Forestry Service. The Maryland Energy Administration was requested to be an alternate service provider. It is anticipated that the Maryland Energy Administration will submit a State Grant proposal during the 2nd-quarter.

Massachusetts

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

Alternative Fuels For Transportation

The program was established to demonstrate alternative transportation fuels, and it continues to broaden and make progress. The Division of Energy Resources (DOER) was successful in its proposal to the USDOE to fund the purchase of OEM CNG-fueled school buses for the Town of Weston. DOER has also issued a Request for Information, inviting vendors to supply biomass-based ethanol for their demonstration program. The DOER is negotiating with a private developer to convert one or more state vehicles to operate with ethanol fuels.

Fuelwood Promotion Program

In conjunction with New York and the NRBP, the DOER serves as a member of the *Residential Woodstoves: Lessons Learned* review team, and has participated with the contractor responsible for the educational outreach component to fine-tune their video presentation and PSA package. A more complete project status report is provided in the New York discussion below.

Wastewater Treatment Program

The DOER reported the results of a study investigating the potentials and barriers to alternative sludge disposal options in recovering methane from the anaerobic digestion of sewage. at the City of Northampton. Although the study showed the economic merit for the recovery of methane and cogeneration at this facility, changing solid waste management requirements may dictate the facility convert from an anaerobic process to an aerobic process. Since this management change is still being evaluated, the project continues to be on hold.

Cogeneration at State Facilities

DOER continues works with others in the review of the availability and quality of wood fuel in the Amherst area. Study results have been used to demonstrate the potential of using wood as a fuel in the University of Massachusetts-Amherst cogeneration project. It is believed, however, that there will be considerable objection raised to the use of any solid fuels combustion on campus. The DOER is consulting with the Maine and Vermont state biomass contacts to develop a response to this perceived institutional barrier.

New Hampshire

The state biomass contact arranged the itinerary for the Attache for Industry and Technology of the Consulate of Finland to learn more about the state's wood-fired utility industry and whole-tree harvesting. The itinerary included tours of wood-fired electric power plants and chipping operations. New Hampshire is considered to be a leading role model because of forest use patterns and the fact that 10 percent of its electricity is derived from wood.

Discussions continued with the New Hampshire Association of Independent Power Producers to host "Wood Energy Day" during October, an event held in conjunction with other state activities during Energy Awareness Month.

Discussions about the possibility of wood pellet manufacturing in the state have increased and will be monitored. Because of this increased level of interest, the state contact attended the Fiber Fuels Institute's *Wood Pellet Conference*. It was reported that over 140 people were registered, with representation strongest from the south, midwest and west. The sessions were technical in nature, intended to respond to the needs of firms contemplating the development of such facilities, as well as the issues that can be

expected once facilities go "on-line". Perspectives were offered by those in the retail stove market, and how that market is key to the success of this new industry.

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. 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 the state but it also represents a solution to a continuing and growing problem in the NRBP states -- productive use for wood that does not belong a s component of the solid waste stream. This commercial wood power proposal has progressed further along than any other similar New Jersey proposal in the past.

New York

Work on the *Lessons Learned* marketing project continues, with the production of a draft public service announcement, educational video tape and companion brochure developed by the contractor Kelliher/Samets Marketing Communications. These two items will be completed by the beginning of the 1st-quarter of the 10th-Year, so that the marketing component can commence before the beginning of the heating season. As previously reported, 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 the Massachusetts Division of Energy Resources, the Massachusetts Division of Environmental Management (supported by the U.S. Forest

Service), the Great Lakes Regional Biomass Program administered by the Council of Great Lakes Governors and the NRBP administered by the CONEG Policy Research Center, Inc.

In addition, NYSERDA conducted a one-day "roundtable" on waste wood processing and combustion for fuel. This roundtable was developed to discuss the technical, regulatory and public policy issues affecting waste wood fuel opportunities in the state. The "roundtable" is a spin-off project from the *Wood Products in the Waste Stream* study discussed below. The "roundtable" was attended by over 25 people, who represent the spectrum of interest in the use of waste wood--solid waste and air regulators, state energy office, project developers, the research community and environmentalists. A copy of the Final Report is provided in the Appendix.

Pennsylvania

The state biomass contact reported the Lycoming County landfill is in the process of permitting and constructing a methane gas-fueled 1-megawatt cogeneration project. A contract has been executed with a utility company to buy the power. Recovered engine heat will be used for space and water heating.

Minor problems continue to plague the Warren State Hospital's wood energy project. Most are contractor performance related. Because of concerns regarding the facility's ability to comply with the Clean Air Act, the Pennsylvania Bureau of Air Quality has placed restrictions on the facilities operating permit so that only fuels having less than a 45% moisture content can be burned. It was pointed out that the restriction encourages inefficient combustion, and is impractical since the moisture content of hardwood residues rarely are less than 45%.

The state biomass contact reported completion of Pennsylvania's *Best Management Practices for Wood Residues* manual. The manual will provide users with least-cost measures to comply with environmental regulations dealing with the storage of wood residues. The manual also addresses storage methods necessary to maintain material quality for marketing or secondary products. Another target audience are wood energy users interested in storing fuel for extended periods of time. The manual was a combined effort of the Pennsylvania Hardwood Development Council, the Bureau of Forestry, the Bureau of Water Quality, the US Forest Service and private industry.

An update on the Pennsylvania *Wood Residue Directory for Sawmills* is reported in progress. Letters were sent to all companies currently listed, with a response sheet to note any changes in operating characteristics. The data is now being compiled, and the new edition will be printed upon data entry.

It was reported that the Pennsylvania Bureau of Solid Waste has published new regulations dealing with wood ash disposal. Included in the new regulations was material classified as co-product. A co-product is defined as a material resulting from the manufacturing process that, without further processing (other than mechanical), can be substituted on a regular basis for a commercially available product of similar composition.

Wood ash seems to meet the requirements of the new regulations. Should this be the case, land application of wood ash derived from "clean" wood combustion will be allowed as a substitute for lime. A permit was required prior to the new regulations which was an expensive and complicated process. The Solid Waste's legal counsel was contacted for specifics on who makes the determination of what qualifies as a co-product. The legal response is that it is at the discretion of the manufacturer, who will be required to produce documentation that the co-product meets all aspects of the regulatory definition.

In addition to the activities mentioned above, the Pennsylvania state contact provided over 30 individuals or companies wood energy information or technical assistance.

Rhode Island

The project entitled *Research and Identify Markets for Recycled Construction/Demolition Waste Wood* was previously reported as being under way, with a revised completion date of March 1993. A Technical Advisory Committee meeting was held, with representatives from private C/D landfills and state agencies attending. A review of C/D waste processing equipment and facility costs was completed. The project has reviewed and identified state programs, policies and other activities that could encourage or discourage the increased reuse and recycling of C/D waste wood. The project has identified specific initiatives and other programs that should result in increasing the recycling level of C/D waste. Research into the potential end-uses of C/D waste identified a number of companies that already, or could potentially, use recycled C/D materials. Further research on the barriers to the potential recycling of C/D waste identified innovative end-uses for C/D wood ash in concrete products.

The revision of the *Wood Stove Handbook* was slowed because of institutional barriers. The *Handbook* is in the process of being written in cooperation with members of the wood stove and chimney sweep community. It is hoped the *Handbook* will be completed by the next heating season, when it will be used in conjunction with the *Lessons Learned* marketing campaign.

The contract for the *Anaerobic Digestion and In-Vessel Composting Options Study* was executed during the quarter. A Technical Advisory Committee was formed to help provide project oversight, and two meetings were also held in the 2nd-quarter. As an addendum to the Rhode Island state budget, two planned waste-to-energy facilities were rejected in favor of a legislative mandate to recycle or compost 70% of the state's waste. The importance of the *Composting Options Study* was elevated as a result, with great interest expressed by legislators and policy makers.

Vermont

The Vermont Department of Public Service continues to express great interest in building a 20-megawatt biomass gasification steam injected generator (BIG/STIG) power plant that would burn waste wood and other woody biomass. Vermont has been among the nation's leaders in their work to develop biomass gasification for electric power

generation. Commissioner Richard P. Sedano of the Department of Public Service has conducted a meeting during the 2nd-quarter to discuss the status of work toward construction of a wood gasification project in Vermont. The meeting reviewed what has happened to date, including the pilot test in which General Electric gasified wood and sugar cane wastes. More importantly, the meeting discussed what specifically Vermont can do to promote an advanced renewable technology for power generation. Attendees represented regulators of energy and the environment on state and federal levels, utilities, environmental groups and the business community.

The state biomass contact also reported that the Barre School, a 120 thousand square foot new construction project, will incorporate a wood chip gasifier heating system. The school will be the largest VT school facility to use wood chips for heating.

APPLIED RESEARCH AND TECHNOLOGY TRANSFER

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

This study was completed and published by the CONEG Policy Research Center in April 1992, and a copy of the final report was submitted during the 3rd-quarter. Work continues on producing more targeted messages to key audiences with different perspectives of this common problem. The four audiences include utility regulators and policy makers, independent power producers, the environmental community, and foresters and the forest products industry. Additional information on these initiatives will be provided in future quarterly reports under the **Educational Outreach** section below.

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

As already reported, NYSERDA signed a contract with Environmental Risk Limited and C.T. Donovan Associates for the amount of $327,542 for Phase I. The Regional Programs have contributed $102,000 towards this effort. CONEG has managed the contract for the Regional Programs. The workplan for the project has been monitored by the Technical Advisory Committee and the NRBP Steering Committee. The project is nearing completion, with a draft of the final report now in review. After the Technical Advisory Committee has reviewed this draft and any changes are made, the final report will be issued. The anticipated completion date is no later than November, 1992

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

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

Commercial Testing and Engineering Company was selected by the Technical Advisory Committee to conduct the performance evaluation, which has a revised scheduled completion date of April 1993.

The project is 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 united fueled by electricity and oil--or in the case of retrofitted systems, of the pre- and post-conversion costs and benefits.

At this time, the 10 active states have recommended potential candidates for the project. From this list, no fewer than six systems, at least one of which is wood gasification unit, will undergo a comprehensive performance analysis. The performance analysis measurements will 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, analysts will be able to determine combustion efficiency in high-fire and standby modes. The smallest system to be measured will be no smaller than 500,000 BTUs per hour. The specification for the largest system has been increased from 5 million BTUs per hour to 10 million BTUs per hour. Selected sites include six facilities proposed by the states of Maine, New York, Pennsylvania and Vermont.

National Biomass Conference and Exhibition

The NRBP previously reported the signing of a contract with C.T. Donovan Associates to plan, organize and conduct the 1992 National Biomass Meeting and the Fifth Annual National Biofuels Conference and Exhibition. The conference will be held in Newton, Massachusetts from 19-22 October 1992.

At this point, efforts are focussed on confirming the 60+ plenary and luncheon speakers for the event. The Contractor has also produced and mailed two conference brochures to an estimated 20,000 potential participants. These participants include federal and state biomass, energy, solid waste management and recycling planners, environmental regulators, and wood waste processing and combustion industry representatives. A copy of the brochure, with complete speaker listing, is provided in the Appendix.

Wood Energy and Recycling Training Course

A common question is "where do foresters fit in on the issue of waste wood recycling?" To help address this issue, a course providing training on a variety of technical, regulatory and environmental issues concerning the processing and use of waste wood for energy and other products was conducted that attracted over 60 participants. Although this four-day training course primarily targeted state and federal foresters, additional

participants included private foresters, state energy office staff and others. The course was conducted on 14-17 September 1992, in Vergennes, Vermont, and some of its objectives included:

- Describing opportunities for using wood and waste wood for energy and identifying forest management, solid waste management, environmental, energy, economic and political benefits associated with using wood for fuel.

- Emphasizing opportunities for displacing fossil fuels with wood fuel in businesses, industry, public buildings and other facilities.

- Describing waste wood processing and recycling technologies and facilities with emphasis on specific technical opportunities (like wood pallets) and end-use markets for recycled wood (such as wood composite products).

- Describing direct combustion and gasification technologies, with emphasis on equipment appropriate for primary and secondary wood product industries, state and municipal buildings, and other commercial and industrial facilities.

- Identifying technical, engineering, economic and energy issues that should be evaluated when selecting, purchasing, financing, operating and maintain wood combustion and gasification systems.

- Establishing case studies and site visits to existing industries, businesses, power generation facilities, and public buildings that use wood for fuel.

The course was a collaborative effort of the Northeast Utilization and Marketing Council, with support from the USDA-Forest Service Northeastern Area State and Private Forestry Rural Development through Forestry Program and the Northeast Regional Biomass Program. It was hosted by the Vermont Department of Forests, Parks and Recreation.

Biomass Facilities Directory

As previously reported, the Independent Energy Magazine was contracted to determine if their publication can be adopted for our needs. After discussion with this group, it was determined that the Facility Directory should be bid under the Request for Proposals process as a part of 10th-Year activities.

Update NRBP Publication

A contract was issued during the 3rd-quarter to Citizens Conservation Corporation to prepare a publication presenting the accomplishments and future direction of the NRBP in summary form. This publication will follow the format of the Northeast Regional

Biomass Program: Mission Accomplishments and Prospects 1991. The publication is scheduled to be printed in October 1992.

EDUCATIONAL OUTREACH

Articles were prepared for the September 1992 issue of Biologue magazine.

A Steering Committee meeting was held in Boston, Massachusetts on 21-22 July.

Made a presentation on the NRBP at the July meeting of the New England Energy Task Force, which is sponsored by the USDOE Boston Support Office.

Attended the *1992 Greenhouse Gas Emissions and Mitigation Research Symposium*, sponsored by the U.S. Environmental Protection Agency. A review of the NRBP wood stove projects was presented.

Attended a quarterly meeting of the Biomass Energy Research Association. The NRBP provides a no-cost meeting space for the Association.

Updated the NRBP brochure and contact listing to include USDOE Regional Support Offices.

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NINTH YEAR - FOURTH QUARTER REPORT

JULY - SEPTEMBER 1992

APPENDIX

NORTHEAST REGIONAL BIOMASS PROGRAM
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Boston, Massachusetts
21-22 July 1992

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PUBLICATIONS

- The Potential for Biomass to Mitigate Greenhouse Gas Emissions in the Northeastern U.S., April 1992
- Evaluation of Residual Stand Damage Following Partial Cutting in Northern Forest Types, June 1990
- Energy Implications of Alternative Waste Management Systems, February 1990
- Directories of Wood Energy Equipment Vendors and of Wood Chip Suppliers and Brokers in the Northeast, June 1989
- Resource Recovery Facility Siting: Recommendations for Economic and Other Equity Adjustments, April 1989
- The Northeast Directory of Biomass Facilities, March 1989
- Managing Municipal Solid Waste: A Comparative Risk Analysis of Landfill and Resource Recovery Facilities, November 1988
- Wood Ash Disposal and Recycling Sourcebook, April 1988
- Using Recycled Wood Waste As Fuel in the Northeast, March 1988
- Impact of Large Biomass Demand Centers on the Forest Resource Base, August 13, 1986
- Economic Impacts of Wood Energy in the Northeast, March 1986
- Industrial Wood/Coal Co-Utilization in the Northeast: Technology Assessment and Case Studies, September 1985
- Air Emission Regulations for Small to Moderate Sized Boilers in the Northeast States, January 1985
- The Wood Chip Market for Residential and Small Commercial Applications: An Exploration of Problems and Opportunities, January 1985
- Guidebook for Industrial/Commercial Wood Energy Conversion, April 1984

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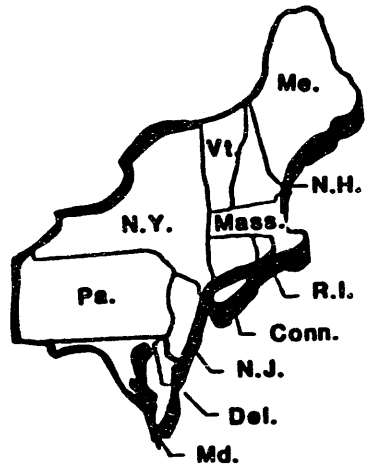
Copies of Publications may be obtained from:

CONEG Policy Research Center, Inc.
400 North Capitol Street, N.W.
Suite 382
Washington, D.C. 20001

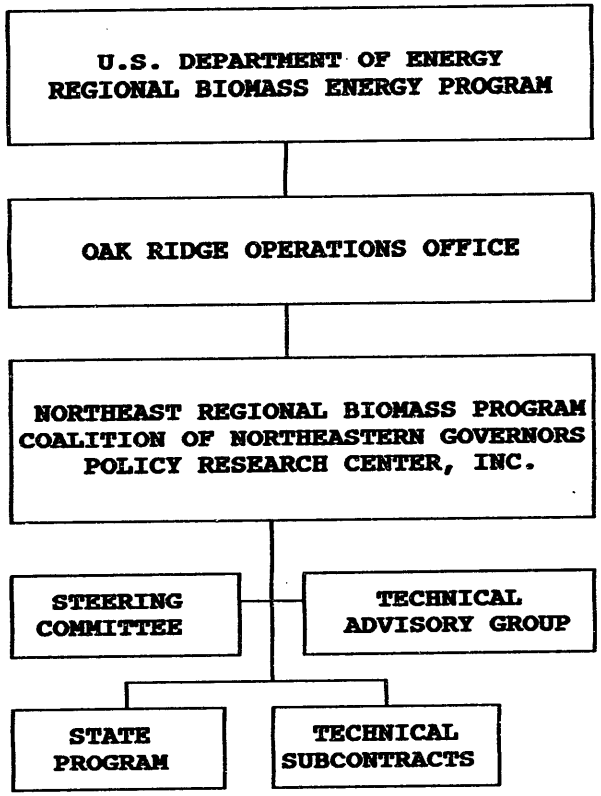
NORTHEAST REGIONAL BIOMASS ENERGY PROGRAM



Biomass Works:

It's Plentiful
It's Renewable
It's Inexpensive
It's Varied

Coalition of Northeastern Governors - CONEG Policy Research Center, Inc.
400 North Capitol Street, N.W.
Suite 382
Washington, D.C. 20001
Telephone (202) 624-8450



BACKGROUND

The Northeast Regional Biomass Program, administered by the Coalition of Northeastern Governors (CONEG) Policy Research Center, Inc., was started in 1983 with a grant from the Biomass Energy Technology Division of the U.S. Department of Energy.

The Technical Advisory Group, comprised of public, private, and academic representatives, meets periodically to identify and recommend programs to address regional biomass needs. These recommendations are forwarded to a Steering Committee made up of Governor's designees from the states participating in the program.

The program has two interrelated parts: state grants and technical subcontracts. The state grant program is designed to coordinate and expand biomass energy activities through interagency programs. The technical subcontract program involved letting subcontracts that address region-wide biomass needs as identified by the Technical Advisory and/or Steering Committee.

GOAL

To encourage, through support of regionally-specific biofuel energy projects, the production and use of energy from biomass-derived fuels, municipal solid waste and other wastes (collectively, "biofuels") by the private sector and local governments.

OBJECTIVES

- To establish the availability and economies of biofuels resources within the Northeast region of the U.S. through resource assessment studies.
- To enable industry to match local biomass resources with conversion technologies that permit private sector investments in biofuels and waste-to-energy technologies.
- To better understand and help mitigate adverse environmental impact of biofuels harvesting and energy use.
- To improve the coordination among, and capabilities of state agencies with responsibilities for biofuels-related work.
- To encourage, through information transfer, appropriate private sector investments in biofuels harvesting and energy technologies.
- To transfer to the private sector the results of biofuels research and development.
- To identify and alleviate obstacles to biofuels energy development.

PROGRAM FOCUS

The Northeast Regional Biomass Energy Program is closely coordinated with State and Federal Governments, regional and national organizations, industry and trade organizations, and universities. The program emphasizes (1) resource assessments, (2) furthering production and conversion technologies, and (3) transferring information and technologies to potential users. A key component of each of these categories is an effort to provide technical assistance to, and cosponsor projects with State energy, forestry and environmental offices to strengthen and integrate programs.

The Northeast Regional Biomass Program has been in operation for a period of nine years. During this time, both state managed programs and technical programs have been conducted covering a wide range of activities primarily aimed at the use and applications of wood as a fuel. These activities include:

- assessments of available biomass resources;
- surveys to determine what industries, businesses, institutions, and utility companies use wood and wood waste for fuel; and
- workshops, seminars, and demonstrations to provide technical assistance.

In the Northeast, an estimated 6.2 million tons of wood are used in the commercial and industrial sector, while 12.5 million cords are used for residential heating annually. Of this useage, 1504.7 mw of power has been generated from biomass. The use of wood energy products has had substantial employment and income benefits in the region.

Although wood and woodwaste have received primary emphasis in the regional program, the use of municipal solid waste has received increased emphasis as an energy source.

The energy contribution of biomass will increase as potential users become more familiar with existing feedstocks, technologies, and applications. The Northeast Regional Biomass Program is designed to support region-specific work to overcome near-term barriers to biomass energy use.

SOLICITATIONS

The Northeast Regional Biomass Program issues periodic solicitations for biomass-related projects identified by the Technical Advisory Group and Steering Committee. Announcements of pending solicitations are widely distributed.

Eligible offerors include profit, nonprofit, university, and other interested organizations in the United States. For more information or to be placed on the mailing list for these solicitations, write to the CONEG Policy Research Center, 400 North Capitol Street, N.W., Suite 382, Washington, D.C. 20001.

ANNOUNCEMENT OF GRANT AVAILABILITY

TITLE: Northeast Regional Biomass Program State Grants

ELIGIBLE GRANTEES: State agencies of the following eleven states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

PROGRAM DESCRIPTION: This is the tenth year of an ongoing program designed to increase biomass energy development and use in the Northeast. The state grants component of this program is aimed at improving state agency coordination and strengthening state capabilities with regard to biomass energy development. Specific activities which may be undertaken include: information dissemination, state agency planning and coordination, technical assistance, research, development and demonstration projects designed to expand biomass energy use in the state.

DEADLINE FOR PROPOSAL: December 15, 1992. Because the U.S. Department of Energy's impending reorganization is expected to result in a close-out of the current NRBP funding process, applications received after this date may be determined ineligable.

STATE GRANT AMOUNT: Up to $30,000, subject to state in-kind match equal to 50 percent of the grant amount.

PERIOD OF PERFORMANCE: 12 Months.

SUBMIT PROPOSAL TO: CONEG Policy Research Center, Inc.
400 North Capitol Street, NW, Suite 382
Washington, D.C. 20001

NUMBER OF COPIES: 1 Original and 2 Copies

FOR FURTHER INFORMATION CONTACT: Philip D. Lusk
CONEG Policy Research Center
(202) 624-8454

INTRODUCTION

The Coalition of Northeastern Governors Policy Research Center, with funds from the U.S. Department of Energy, is continuing for a tenth year a program that includes sponsorship of biomass energy programs in eleven states. In prior years, states have initiated programs primarily in four general areas: industrial conversion assistance, resource availability and use assessments; technical information development and dissemination; and conversion of public facilities.

In each state, the Northeast Regional Biomass Program has provided the beginning of a constructive, on-going relationship between at least two agencies. Unlike most other energy sources, biomass requires the involvement of several agencies and jurisdictions. Therefore, the center piece of the state grants program will continue to be interagency cooperation within the appropriate State offices (i.e. energy, forestry, environmental).

Each of the eleven states participating in the NRBP have previously put together imaginative proposals that address each state-specific concerns. The projects mainly focused on wood energy due to the overwhelming promise of this particular biomass feedstock and the commercial viability of existing technology in this area. The NRBP will continue to focus on wood, however, where it is appropriate, states are encouraged to examine opportunities to address barriers to the greater use of other biomass energy sources including municipal solid waste, and co-firing biomass with conventional energy sources.

PROGRAM DESCRIPTION

The state grants program constitutes approximately one half of the Northeast Regional Biomass Program. The other component is a series of technical reports and studies which will concentrate on technical assistance to business and industry, wood stove emissions, air quality standards and biomass technology development.

Technical studies will continue to be designed to complement the efforts of state agencies in a variety of ways. For example, staff conducting a state wood energy program may have occasion to refer a plant manager to the assistance program for help in determining the feasibility to converting to a wood energy system. Every opportunity will be provided for state agency staff to take advantage of the technical studies and the information gained therefrom. A central purpose of the technical studies is to provide background data and resources to states officials.

PROGRAM OBJECTIVES

The goals of the state grants program is to develop the capability among state agencies to promote and develop wood and other biomass energy resources. Specific objectives for this program include:

- Improve the effectiveness, coordination and planning capability among state agencies to promote and develop wood and other biomass energy-related responsibilities.

- Provide information to private companies, residential and commercial consumers, and public institutions regarding the economic potential, safety requirements, and versatility of biomass and wood energy use.

- Mitigate environmental impacts associated with wood harvesting and combustion.

- Protect and improve the forest resource base.

- Increase the efficiency of wood energy use in the residential, industrial and commercial sectors.

- Increase the safety and protect the health of residential energy consumers.

STATEMENT OF WORK

Funding of each state program will be provided at a level of up to $30,000 for a period of 12 months. Although the grant performance period may have been extended in past years, tenth year grants will not be extended because the U.S. Department of Energy's impending reorganization is expected to result in a close-out of the current NRBP funding process. Although Congress has appropriated funds for a continued program in FY93, state proposals which anticipate eleventh year activities would not be appropriate because of the impending reorganization. Additional funding will be sought beyond the FY93 appropriations.

Beyond the requirement that the proposed program must represent a cooperative effort between state agencies, projects should respond to a demonstrated state need. Legitimate uses of project funds include hiring or retaining a staff person to serve as liaison between agencies or funding specific research, development or demonstration projects. Information transfer, including the use of public media, should be a key component of any program. Likewise, involvement of other agencies, offices, universities, private industry groups, and trade associations, to increase the resources and expand the reach of the program will strengthen the application.

A broad spectrum of possible projects include the following topical areas:

- resource inventory and use surveys

- biomass conversion at public facilities

- wood burning in the residential, commercial and industrial section

- pollution control of wood combustion emissions

- institutional factors, such as inter-agency coordination or public/private cooperative efforts

- consumer issues, such as wood stove safety

- technology improvement for wood chips or pellets

- wood supply and marketing mechanisms

- financial incentives for expanded biomass energy use
- landowner issues related to woodlot management
- research, development and demonstration of improved combustion technology
- utilizing municipal waste and recycled biomass waste as an energy resource
- co-firing biomass with conventional energy sources

Additional topics, where they address a specific state need, will be given full consideration.

PROCESS FOR EVALUATING PROPOSALS

State grant proposals will be reviewed by CONEG staff and the technical coordinator for the Northeast Regional Biomass Program (NRBP). Proposals will be evaluated according to their degree of impact on the overall goals of the Northeast Regional Biomass Program. Specific criteria include the following:

Institutional Coordination

- Cooperation between state energy, forestry and other appropriate agencies in the design and implementation of the program.
- Potential to involve other organizations, institutions and association as participants in the program.
- Likelihood of improving private sector, state agency, interstate and local government involvement in biomass and wood energy issues.
- Beneficial impact on government rules and regulations.

State Impact

- Number of individuals, industries, and institutions reached.
- Amount of conventional fuels replaced with wood or other biomass resources.

APPLICATION INSTRUCTIONS

Applications should be coordinated between appropriate state offices, and submitted by the Governor. Agencies should work together to assess state needs and determine a cooperative program designed to meet those needs. The final proposal should not exceed ten pages and should contain the following components:

I. A cover letter of transmittal, signed by the Governor.

II. A one-page summary of the proposed project.

III. A narrative proposal with the following components:

A. Problem Statement

1. statement of general and specific wood energy related issues and needs; and

2. a summary of prior year projects under the NRBP and other biomass energy-related work.

B. Statement of Work

NOTE: Information requested in items 1 and 2 should be arranged in the form of tasks as contained in the previous years contract.

1. Objectives--A description of the goals and measurable impacts of the grant program.

2. Strategies--An outline of the methods and approaches to be used to achieve the stated objectives.

3. Project Description--A description of the program structure and the day-to-day operations and activities.

4. Implementation Plan--An outline of the project timetable, the development of interagency cooperation and the relationship to current agency programs.

5. Relation to Previous State Program--The grant funds may be used to fund existing programs and activities only if the state clearly demonstrates that the program would not be funded otherwise.

6. Relation to Prior Year NRBP Projects--A description of how this year relates to the prior year project.

7. Schedule--The proposed timeline for completion of project activities, including key milestones in the project's development.

8. Participants--Identify participating state agencies and staff names if available. Indicate evidence of approval of program proposal by chief forestry and energy officials.

9. Project Management--Describe the program management structure including the names and titles of key personnel.

10. Deliverables--Indicate program products (e.g., seminars, training materials, publications, research reports etc. Products must include three quarterly progress reports and a final project report.

C. Budget proposal narrative discussion of budget proposal including a detailed description of state in-kind match.

IV. Cost proposal using OMB Optional Form 60 (see Attachment A). The project budget must include auditable in-kind contribution equalling 50 percent of the grant award (i.e. one-third of the total project budget). The matching funds may not be borne by another Federal grant, contract or other Federal government funds. However, general revenue sharing funds under 31 U.S.C. 1212 are not considered a Federal grant. Source of in-kind contributions must be identified in the cost proposal.

FREEDOM OF INFORMATION NOTIFICATION (FOIA)

Please be advised that applications submitted in response to this solicitation are subject to disclosure under the Freedom of Information Act (FOIA). To assist the Department of Energy in determining whether or not to release information contained in an application in the event an FOI request is received, applicants may, through clear earmarking or otherwise, indicate those portions of their applications which they believe should not be disclosed. While an applicant's advice will be considered by the Department of Energy in its determination whether to release requested information or not, it must be emphasized that the Department is required by the FOIA to make an independent evaluation as to the release of all information requested, and that accordingly, information may be released notwithstanding the applicant's views.

Attachments: A--OMB Optional Form 60

NEW YORK STATE ROUNDTABLE ON WASTEWOOD PROCESSING AND COMBUSTION FOR FUEL

Final Report

Project Cosponsors:

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY

U.S. Department of Energy
Northeast Regional Biomass Program
administered by the:
CONEG Policy Research Center, Inc.

NOTICE

This report was prepared by C.T. Donovan Associates Inc. in the course of performing work contracted for and sponsored by the New York State Energy Research and Development Authority and the United States Department of Energy's Northeast Regional Biomass Program administered by the CONEG Policy Research Center, Inc. (hereafter the "Sponsors"). The opinions expressed in this report do not necessarily reflect those of the sponsors or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, the Sponsors and the State of New York make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. the Sponsors, the State of New York, and the contractors make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

FINAL REPORT

NEW YORK STATE ROUNDTABLE ON

WASTE WOOD PROCESSING AND COMBUSTION FOR FUEL:

Technical, Regulatory, and Public Policy Issues Affecting

Future Opportunities in New York State

Wednesday, September 23, 1992
Legislative Office Building, Room 711A
Rockefeller Plaza
Albany, New York

Sponsored by:

Jeffrey M. Peterson
Program Manager, Energy Resources
New York State Energy Research and Development Authority
Albany, New York

and

U.S. Department of Energy
Northeast Regional Biomass Program
administered by the:
CONEG Policy Research Center, Inc.
Washington, D.C.

Organized by:

C.T. Donovan Associates, Inc.
Burlington, Vermont

TABLE OF CONTENTS

SECTION I: PURPOSE OF THE ROUNDTABLE

There is increasing interest in using renewable energy resources for power production in New York State. The use of wood, particularly waste wood for energy, offers the potential to diversify fuel sources and decrease the amount of material disposed in landfills. Yet, as with any energy source, it is important that wood and waste wood be used for fuel in an environmentally acceptable and cost effective manner.

To further evaluate wood energy opportunities in New York, the New York State Energy Research and Development Authority (The Energy Authority) sponsored a one-day roundtable that addressed a variety of technical, regulatory, and public policy issues related to processing and combustion of waste wood for energy. The roundtable was a "roll-up- your-sleeves roundtable discussion" for public- and private-sector officials involved in developing, citing, regulating, and permitting waste wood processing and combustion facilities. The objectives of the roundtable were:

- Review and discuss "Wood Products in the Waste Stream: Characterization and Combustion Emissions" a study funded by: the Energy Authority; the U.S. Department of Energy's Regional Biomass Programs; U.S. Environmental Protection Agency; Virginia Department of Mines, Minerals, and Energy; and the Canadian Department of Energy, Mines, and Resources;

- Identify major waste wood processing and combustion issues discussed in the characterization and combustion emissions study;

- Determine additional information, data, and research about waste wood processing and combustion needed in the future;

- Review and discuss energy, solid waste, and air policies and regulations in effect in New York State that apply to waste wood processing and combustion facilities including policies and regulations developed and implemented at the federal, state, and regional levels;

- Identify current policies and regulations in New York State that conflict with other state policies and regulations, and are inconsistent with results of the characterization and combustion emissions study;

- Identify and discuss barriers to waste wood processing and combustion created by the inconsistencies;

- Develop specific strategies for eliminating or reducing the barriers; and

- Develop an action plan that can be carried out in New York State to accomplish the strategies.

Roundtable Agenda

9:00 - 9:15	**Welcome, Purpose of the Roundtable, and Introductions** Jeffrey M. Peterson, Program Manager, Energy Resources Group, New York State Energy Research and Development Authority
9:15 - 9:30	**Discussion of What The Roundtable Is and Is Not Intended to Accomplish** Christine T. Donovan, President C.T. Donovan Associates, Inc., Burlington, Vermont
9:30 - 10:45	**Summary of the Waste Wood Characterization Report - Part 1** **Overview of Research Methodologies, Basis for Study, Fuel Quality Characteristics, Air Emissions Characteristics, Wood Ash Characteristics** Dr. Richard Atkins, Principal Environmental Risk Limited, Bloomfield, Connecticut
10:45 - 11:00	Break
11:00 - 12:00	**Summary of the Waste Wood Characterization Report - Part 2** **Overview of the Types and Amounts of Waste Wood, Major Energy, Solid Waste Management, Air Emissions, and Ash Disposal Issues** Christine T. Donovan
Noon - 1:00	Lunch
1:00 - 1:30	**Results of the Pre-Roundtable Questionnaire** **Eric S. Palola, Environmental and Energy Analyst** **C.T. Donovan Associates, Inc.**
1:30 - 3:00	**Group Discussion of the Most Important Federal, State, or Local Issues Affecting Opportunities to Process and use Wood Fuel in New York State in the Future** - Energy Policy Issues - Solid Waste Management and Recycling Issues - Air Emissions and Air Quality Issues - Ash Management and Disposal Issues - Other Issues
3:00 - 3:30	Break
3:30 - 4:30	**Brainstorming Session to Develop Strategies and Recommendations for New York State**
4:30 - 5:00	**Closing Remarks - Jeffrey M. Peterson**

Roundtable Participants

Dr. Richard Atkins, Principal
Environmental Risk Ltd., Bloomfield, CT

Al Beers
New York State Electric and Gas, Binghamton, NY

Edward Bell
New York State Department of Environmental Conservation, Region 5

Garry Brown
New York State Energy Office, Albany, NY

William G. Carter, Vice President
Kenetech Energy Systems Inc., Meriden, CT

Dr. James Cook
National Audubon Society, Islip, NY

Dawn Dana
New York State Energy Office, Albany, NY

Mirka Dellacava
Natural Resources Defense Council, New York City, NY

Christine T. Donovan, President
C.T. Donovan Associates, Inc., Burlington, VT

Brian Doyle, President
Doyle Engineering, Putnam Valley, NY

Jeffrey E. Fehrs, P.E., Solid Waste Specialist
C.T. Donovan Associates, Inc., Burlington, VT

Tom Fiesinger
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Paul Kieda
Division of Air Resources, New York State Department of Environmental Conservation, Albany, NY

Kevin S. King, Executive Vice President
Empire State Forest Products Association, Albany, NY

Philip Lusk, Director
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CONEG Policy Research Center Inc., Inc., Washington. D.C.

Percival Miller, Senior Analyst
New York State Legislative Commission on Solid Waste, Albany, NY

Jeff Nelson
Kenetech Energy Systems Inc., Meriden, CT

Eric Palola, Energy and Environmental Analyst
C.T. Donovan Associates, Inc., Burlington, VT

Jeffrey M. Peterson, Program Manager
Energy Resources Group, New York State Energy Research and Development Authority, Albany, NY

Matt Polge, Combustion Section
Division of Air Resources New York State Department of Environmental Conservation, Albany, NY

James Ralston, P.E., Chief Abatement Planning
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New York State Department of Environmental Conservation, Albany, NY

Mark Richardson
New York State Electric and Gas, Albany, NY

Larry Rosenmann
Division of Solid Waste, New York State Department of Environmental Conservation, Albany, NY

Michael Tesla
New York State Electric and Gas, Binghamton, NY

John Reese
New York State Energy Office, Albany, NY

Joe Sayer
New York State Energy Research and Development Authority, Albany, NY

SECTION II: CONTEXT FOR THE ROUNDTABLE DISCUSSION

Intent of the Discussion

- Informal discussion among a diverse cross-section of public- and private-sector representatives
- Focus on sharing information and viewpoints, not on reaching resolution
- Identify areas of clarity, agreement
- Identify areas of uncertainty, disagreement
- Discuss barriers - real or perceived
- Determine additional research, information, and data needed
- Develop strategies and an action plan for addressing barriers and research needs
- Not to advocate positions on a particular issue
- Not to lobby for a specific wood project
- Not to develop new policies
- Not to make decisions on a specific project

Definition of Terms

For consistency and to aid the discussion, the following definitions of potential waste wood fuel sources were used during the roundtable. These definitions were identified during research for the report Wood Products In The Waste Stream: Characterization and Combustion Emissions (November 1992) funded by the Energy Authority and other state and federal agencies (1).

- o **"Clean, untreated wood"** - Wood harvested from the forest as a result of forest management activities, site development, or commercial logging residue. Also refers to untreated pallets, dimensional lumber, construction wood, demolition wood, and mill residue that contain no non-wood physical or chemical materials.

- o **"Treated wood"** - Wood that has been treated or chemically changed in some way including:

  - Wood **surface-coated** with paints, stains, coatings, or preservatives such as painted trim, stained cabinets, and plastic laminates.

  - Wood products **manufactured with glues and binders**, such as plywood, particleboard, and other building products.

  - Wood **impregnated with preservatives**, such as railroad ties (containing creosote), utility poles (containing pentachlorophenol), and pressure-treated wood (containing chromated copper arsenate [CCA]).

- o Clean and treated waste wood may contain **physically separable items** such as pallets with staples, dimensional lumber with nails, and manufactured building products with fixtures.

- o **Waste wood"** - All types of wood, whether clean or treated.

(1) The complete report name is entitled: Wood Products in the Waste Stream: Characterization and Combustion Emissions, Contract No. 1531-ERER-ER-91 cosponsored by the New York State Energy Research and Development Authority, U.S. Environmental Protection Agency, Canadian Department of Energy, Mines, and Resources, U.S. Department of Energy's Regional Biomass Program, and the Virginia Department of Mines, Minerals, and Energy. The report is available from the Energy Authority at 518-465-6251, ext. 272.

Types and Sources of Waste Wood

Harvested Wood

Silviculture - Commercial logging residue, residue from forest thinnings and management.

Site Conversion - Residue from conversion of land for houses, businesses, industries, agriculture, and roads.

Agriculture - Residue from orchard trimmings, annual mortality, and agricultural harvests.

Mill Residue

Primary Wood Products Industries -

Residue from sawmills, pulp and paper mills, and other mill work companies.

Secondary Wood Products Industries -

Residue from industries that manufacture wood products with lumber milled by primary wood industries. Examples include furniture manufacturers, cabinet makers, and particleboard manufacturers.

"Urban" Waste Wood

Pallets - Discarded pallets that can be reused or repaired.

C/D Wood - Untreated and treated wood residue generated by the construction, renovation, and demolition of buildings, roads, and other structures.

MSW/Other Wood - Wood commonly commingled in the municipal solid waste stream; e.g., yard waste, household wood waste, urban forestry, and right-of-way clearings.

SECTION III: HIGHLIGHTS OF QUESTIONNAIRE RESULTS

Before the roundtable session, a detailed questionnaire was sent to the participants that asked for responses on general wood energy and regulatory policies as well as on specific energy, air, and solid waste technical issues that affect waste wood processing and combustion for energy.

Ten completed questionnaires were received. Although not statistically relevant, the responses fairly reflect the variety of interests, perspectives, and roles represented at the Roundtable. Of the ten, three were received from State agency regulators; one from the State Energy Office; two from private energy companies; two from non-profit organizations; and two from other groups such as public utilities.

This section summarizes the responses in three categories: "Areas of Agreement"; "Mixed Responses"; and "Points of Interest." For the purpose of this summary "agreement" is defined as five or more similar responses; "mixed response" is defined as areas where opinions were split or unsure; and "points of interest" are based on overall impressions of the responses by the project team. In addition, Appendix B contains a copy of the full questionnaire with a compilation of all responses received.

Areas of Agreement

Background Issues

- Combustion equipment can remove contaminants in waste wood fuels.
- Waste wood for fuel should be increased and viewed as a renewable energy resource.
- Waste wood waste for fuel should not be considered solid waste "incineration".
- Unsure if processing facilities use commercially available waste wood processing equipment.

Energy Policy Issues

- Policy should strive to create more economic incentives for wood energy in power markets.

Solid Waste Management and Recycling Issues

- Policy should consider wood waste for fuel as a reuse or recycling activity, not disposal.

Air Emissions and Air Quality Issues

- Fuel quality specifications are as important as combustion equipment.

Ash Management and Disposal

- Ash from treated wood combustion should not be defined as categorically hazardous.

Mixed Responses

Background Issues

- Whether waste wood processing equipment is capable of adequately removing contaminants.
- Whether there is enough demand for processed waste wood for purposes other than fuel.
- Whether wood-fired units utilize use technology for combusting treated wood.

Energy Policy Issues

- Whether regulatory environment will allow citing and permitting of wood-fired facilities, despite support from energy policies.

Solid Waste Management & Recycling Issues

- Whether sufficient data are available on types and amounts of wood waste generated.
- Whether policies should consider wood for fuel as only a reuse activity but not a recycling activity.

Air Emissions and Air Quality Issues

- Whether criteria air pollutants are a more significant permitting concern than air toxic pollutants.
- Whether industrial-scale systems are cleaner burning than larger independent power plants.

Ash Management and Disposal

- Whether treated wood ash should be used in various recycled products.
- Whether fly ash and bottom ash should be managed separately.

Points of Interest

Background Issues

- Several respondents pointed out the need for more research on issues that are central to data developed in the Energy Authority, et al. study. It will be important to know when participants have read the full report if there are significant information gaps.

- Diverse opinions on whether waste wood processing equipment can sufficiently "clean" treated waste wood for use as fuel. In addition most respondents were uncertain if the equipment, although commercially available, is used by processing facilities.

Energy Policy Issues

- Several indicated that financial incentives in the power market (or lack of), and the need to generate public support during the citing process were equally or more important than environmental issues related to air and ash impacts.

Solid Waste Management and Recycling Issues

- A variety of views exist about where on the "disposal-diversion-reuse-recycling spectrum" waste wood for energy should fit. Although most agreed that energy recovery of waste wood should not be thought of in terms of "disposal" or "incineration", there were mixed views on how it ought to be defined.

Air Emissions and Air Quality Issues

- Diverse opinions exist about whether the standard criteria pollutants of PM, NOx, VOC's etc. are a larger air quality permitting concern than potential air toxics from waste wood combustion.

Ash Management and Disposal

- Half thought that ash should be tested for hazardous waste characteristics; others disagreed or were unsure. However, a majority felt that waste wood ash should not be categorized as a hazardous waste.

SECTION IV: HIGHLIGHTS OF THE DISCUSSION OF ISSUES

Roundtable participants identified a range of issues affecting the use of waste wood for fuel in New York State that are listed in Table IV-I. The issues were organized under five major categories: energy policies; solid waste management and recycling; air quality; solid waste management of ash; and "other issues". It is important t emphasize that Table IV-I reflects ^Qopinions^P expressed during the discussion. The opinions do not represent formal policy statements o positions by any of the public or private organizations in attendance The Roundtable was purposefully designed to promote a candid, off-the-record, exchange on opportunities and constraints affecting waste wood combustion in New York State.

Major issues and opinions raised during the discussion under eac of the five categories are summarized below. This summary reflects a larger emphasis placed by the group on these issues compared to the range of other issues identified in Table IV-I.

Energy Policy Issues

- Development of natural gas facilities currently has an economic advantage compared to waste wood power development in New York State.

- Wood fuels may be able to compete with conventional fuels if environmental benefits are recognized through externality pricing. However, many New York utilities have asserted that new environmental controls due to the Clean Air Act amendments will nc affect their avoided cost calculations for new power purchases of conventional fuels.

- Power from waste wood combustion offsets long-term reliance on, ar vulnerability to disruption from, imports of other fossil fuels. Fuel diversity enhances economic stability in New York State.

Solid Waste Management and Recycling Issues

- There is regulatory uncertainty about how to classify treated waste wood feedstocks, how much of what types to allow for use as fuel, and appropriate testing methods.

- Characterization and classification of specific waste wood types for use as fuel would be useful to wood combustion facility developers.

- Energy recovery from wood represents a viable disposal option for bulky waste wood, particularly for treated waste wood. Some chemical contaminants may be better destroyed by controlled combustion compared to volatization and leaching from land disposal.

TABLE IV-1: IDENTIFICATION OF ISSUES FROM THE ROUNDTABLE DISCUSSION (a) (b)

ENERGY POLICIES	SOLID WASTE & RECYCLING ISSUES	AIR QUALITY ISSUES	SOLID WASTE ISSUES - ASH	OTHER ISSUES
From an energy standpoint, more liquid waste fuels are burned than solid waste wood.	Important to verify fuel quality and mix of feedstocks.	Desire consistent emissions standards among different fuels ..."level the playing field."	Regular ash sampling is a form of continuous emissions monitoring.	Regulatory perception persists regarding the inability of facility operators to reliably monitor fuel, air and ash quality.
Waste wood fuels contribute to fuel diversity in NY; lessen long-term reliance on more vulnerable fuel imports.	Need to identify fuel quality standards for waste wood(s).	Why monitor waste wood feedstocks differently than other fuels if emissions standards are achieved?	Ash testing is necessary for facility compliance.	Use of an "environmental monitor" to assess compliance may assist regulators.
Power market incentives (or lack of) may overshadow air and ash permitting issues for new waste wood combustion facilities.	CCA-treated wood is a problem because of chromium levels.	Appropriate terminology and classification of wood-fired facilities is needed.	Pre-sorting fuel may assist regulatory acceptance and markets for wood fuels. Ash disposal costs influence fuel quality controls and monitoring.	Does enforceability matter if environmental and fuel quality standards are met?
Is electricity production the only (or necessarily the best) market for processed waste wood?	New opportunities for co-firing wood with MSW. However, is this the best use of wood fuel?	All air standards are evolving together; there is uncertainty from CAAA amendments due to unresolved rulemaking.	Of metals measured, how much is chromium-6 vs chromium-3?	Regulatory experience and availability of data are changing; most experience is in fossil fuels.
Wood fuels can "compete" if true environmental costs are included.	Public perception and reaction to "combustion" and/or the term "incineration" is very problematic.	Different types of waste wood mean different permitting concerns.	TCLP tests for ash are expensive, several hundred dollars per sample.	Public perception/acceptance around harvesting wood for fuel is an issue.
NY utilities attribute no new environmental costs in their avoided cost calculations as a result of CAAA (for conventional fuels).	What is appropriate solid waste management strategy for discarded utility poles and railroad ties (other than combustion)?	In NY, "incineration" status of waste wood burners stems from previous regulatory treatment of other waste liquid fuels and concern about air toxics.	To satisfy "beneficial use" classification of ash, weekly TCLP sampling is required.	Habitat/biodiversity concerns may be an issue if demand for harvested wood fuel grows substantially.
NYSEO intends to push internalization of environmental externalities.	What is likely percent of CCA-treated wood in various waste wood streams?	Regional non-attainment issues will likely affect ALL wood fired facilities. NYSDEC very concerned with NOx emissions. SNCR may be necessary for new facilities.	What levels of "contamination" of waste wood ash cause it to be unsuitable for use as a soil amendment and/or compost material?	Use of recycled wood fuels may offset portion of harvested wood fuel. This could offset biodiversity concerns from forest harvesting?
Are externalities necessary if "level playing field" is achieved in environmental permitting standards?	Are there any marketing efforts by NYS Department of Economic Developemnt Recycling Office to promote alternative uses of waste wood?	"Severe" non-attainment in urban areas mean that 25 tons per year (TPY) standard for NOx will limit new oil boilers to 19 MMBtu/hr size.	Even though ash from treated waste wood combustion may pass TCLP, should it be landspread?	Foresters want fuel markets because of forest management and timber stand improvement needs.
Despite its clean burning qualities, long-term supply of natural gas is uncertain.	Where should regulatory limits be regarding how much non-harvested, potentially treated wood is acceptable for use as fuel. Should they be determined case by case?	Combustion of certain types of treated wood (i.e. plywood & particleboard) can improve combustion and lower emissions due to low fuel moisture (compared to green wood).	Sound management of ash from combustion results in safer disposal than leaching from unsorted waste wood in a landfill or C/D dump.	What is public perception about the fate of waste wood removed as a result of site conversion activities?
300 MW set-aside for renewables is of questionable benefit to wood-fired power industry without resolving utility pricing and environmental regulatory issues.	Are there any testing devices for "spot sampling" contaminants in waste wood piles?	Recognize lower SOx and CO2 from wood combustion; formation of calcium oxide controls acid gas emissions.		
	Wood-fired power plants can offer lower tipping fees for the management of waste wood than land disposal fees.			

TABLE IV-1: CONTINUED

ENERGY POLICIES	SOLID WASTE & RECYCLING ISSUES	AIR QUALITY ISSUES	SOLID WASTE ISSUES - ASH	OTHER ISSUES
Gas is still cheap compared to wood-fired units. When demand is created for waste wood fuel, suppliers will be able to meet the need. Economies of scale in wood-fired power plant development may be affected in part by fuel storage and hauling costs. Wood can be competitive on a Btu-basis when costs of compliance from other fuels are factored in. NYSEG has the most coal stoker boilers in NY that can potentially co-fire with waste wood fuels. Overall potential contribution of wood needs to to be kept in perspective with current contribution from other energy sources. In Connecticut, a 20 MW annual capacity has been discovered in discarded telephone and utility poles alone.	Hauling costs are an issue in wood fuel procurement. There is growing interest in the potential role of processed waste wood in compost products.	Fuel switching to, and co-firing with wood may help achieve NOx stds.; EPRI & TVA researching this. Draft NYSDEC rule on NOx promotes fuel switching if result is lower NOx emissions. Performance of "older" industrial boilers of concern to NYSDEC. Retrofits and new facilities should be treated equally in emissions standards. From fuel standpoint, creosote-treated wood is not contaminated because it burns hot and clean. New source review for sources in nonattainment will require LAER at 100 TPY for CO2 and NOx, 50 TPY for VOC in "upstate" NY; 25 TPY for NOx and CO2 "downstate". Quantifiable, enforceable offsets will be tradeable in "upstate" nonattainment areas. In "severe"areas; however, they will not be tradeable. LAER compliance may require secondary combustion of furnace gases. NYSDEC needs comments from wood combustion operators on new Part 231 rules concerning offsetting and banking.	**AIR QUALITY ISSUES - cont.** Standards for fuel have to do with the amount of certain types burned. Requirements are still evolving at NY DEC. More stack emission data would be useful. Metals emissions performance from waste wood combustion may be better than oil burning. All forms of combustion are "in a cloud" in NY due to ozone transport models and Title 1 of CAAA. Emissions standards for criteria pollutants based on electricity produced is more equitable than standards based on heat input. This could improve thermal efficiency. Title V operating permits under CAAA will help "levelize the playing field" due to new fees for emissions.	

(a) This table was compiled from statements made during the Roundtable discussion of issues affecting the use of "clean" and "treated" waste wood for fuel in New York State held in Albany, N.Y. September 23, 1992. The Roundtable, sponsored by the Northeast Regional Biomass Program and the Energy Authority, was organized and conducted by C.T. Donovan Associates, Inc. of Burlington, VT.

(b) Statements in this table are based on views and opinions shared at the Roundtable and do not represent formal policies or positions of the Energy Authority or other public or private organizations.

Air Quality Issues

- Wood-fired facility developers desire a "level playing field" that treats emissions and fuel specifications equally with other combustion fuels, such as coal and oil.

- The "incineration" status of waste wood boilers in New York State is viewed as an impediment to development of wood energy for a variety of reasons related to differences in combustion performance and public acceptance.

- Non-attainment provisions and New Source Review standards resulting from the Clean Air Act Amendments will significantly effect the citing and permitting of new waste wood combustion facilities.

Solid Waste Management of Ash

- A consistent ash sampling program is the most definitive form of "continuous emissions monitoring" since it measures both combustion performance and potential fuel contamination.

- TCLP testing for ash is expensive. To avoid land disposal costs for ash, however, a "beneficial use" determination requires weekly TCLP testing.

- Even if ash from treated wood combustion passes TCLP tests, it is unclear whether it should be allowed to be landspread or used in compost and soil amendment products.

Other Issues

- Previous regulatory experience with a waste wood combustion facility in New York has created doubt about whether facility operators will conduct accurate monitoring and testing procedures of fuel, air, and ash.

- Regulatory experience and perception is evolving as more data on waste wood properties and combustion becomes available. To date, most regulatory experience in New York State has been in fossil fuel combustion.

- Habitat and biodiversity issues may be a concern if substantial growth in demand for clean harvested wood for fuel occurs in New York State. Use of non-harvested wood recycled from the waste stream may offset some of these concerns.

SECTION V: RECOMMENDATIONS AND ACTION PLAN

Roundtable participants were asked to identify specific strategies for addressing issues identified in Section IV. This section summarizes the results of the discussion. The intent is to identify key steps that will assist air and solid waste regulators, state energy planners and policymakers, wood energy industry representatives, and public interest groups to evaluate the future use of waste wood for fuel in New York State.

An important assumption in the discussion was that waste wood may be an underutilized energy resource with potential to increase in New York State, provided that environmental and economic criteria can be met. This assumption is reinforced by current energy policies. However, it may not be universally accepted by regulators or the general public due to a variety of environmental and public health concerns towards any form of combustion.

The strategies identified by the roundtable participants address both technical and informational needs. However, it is important to emphasize that roundtable participants were asked to present and discuss strategies and recommendations, not to rank them.

Energy Policy Recommendations

- Energy policies should provide information about the environmental impacts of waste wood combustion compared to other fuels.
- Energy policies should promote solid waste management-energy-and-economic linkages of using waste wood for fuel.
- Energy policies should encourage application of externality values; however, the wood energy industry should not rely on externalities as a primary financial incentive.
- The waste wood energy industry needs to "make its case" to energy policymakers and other public officials.
- "Treated" waste wood should be distinguished from other types of wood fuels as a potential renewable energy resource.

Solid Waste Management and Recycling Recommendations

- NYSDEC solid waste officials should be encouraged to read and become familiar with the report Wood Products In The Waste Stream: Characterization and Combustion Emissions (November 1992) funded by the Energy Authority and other state and federal agencies.
- NYSDEC solid waste policies and regulations should refine the definitions of "clean" and "treated" waste wood and be consistent with air quality definitions.

- The definition of waste wood should not be based on the "end use" but on its characteristics. NYSDEC solid waste regulations should broaden the definition of acceptable "clean" wood for use as fuel.

- The magnitude of waste wood disposal problems in New York State needs to be communicated to the public and NYSDEC.

- NYSDEC should reconsider policies on the use of waste wood for fuel as "not recycling" given environmental impacts of alternative disposal. NYSDEC should establish policy that energy recovery of wood is "recycling" and provide guidance on this question during the development of local and regional solid waste plans.

- NYSDEC and/or other New York State agencies should provide information on the market values for using wood for fuel and other end uses.

- NYSDEC should consider banning waste wood from landfills to encourage reuse and recycling of waste for fuel (and other products). At a minimum, segregation of waste wood by types and/or characteristics should be required.

- Energy recovery of a "homogeneous waste stream" such as clean waste wood should have priority over landfilling and MSW incineration in State solid waste policies.

- More specific identification of non-metal contaminants in waste wood is needed.

- NYSDEC should specifically promote waste wood as a renewable resource in solid waste policies.

- NYSDEC should evaluate the life-cycle costs of various waste wood disposal options compared to controlled combustion for energy.

Air Quality Management Recommendations

- NYSDEC air quality officials should be encouraged to read and become familiar with the report Wood Products In The Waste Stream: Characterization and Combustion Emissions (November 1992) funded by the Energy Authority and other state and federal agencies.

- NYSDEC air quality policies and regulations should refine their definitions of "clean" and "treated" waste wood and be consistent with solid waste definitions.

- The definition of waste wood should not be based on "end use" but on its characteristics. NYSDEC air regulations should broaden the definition of acceptable "clean" wood for use as fuel.

- NYSDEC should strive to create a "level playing field" in permitting standards between both new and existing combustion units, and across different fuel sources.

- Terminology and facility classifications make a significant difference in regulatory and public acceptance. Waste wood boilers should not be designated as "process incinerators".

- NYSDEC needs to authorize more test burns of various waste wood sources to gather baseline data on emissions performance.

- Given the interstate nature of air pollution issues in the northeast, more communication is necessary between regulators on waste wood combustion impacts, especially the risk assessment of relevant air impacts.

Solid Waste - Ash Management Recommendations

- Research is needed to develop more specific correlations between air and ash contaminants of treated waste wood.

- New York State solid waste and agricultural agencies should reconcile the designation of wood ash as both a commodity and a solid waste and should develop clearly defined permitting pathways.

- NYSDEC should promote wood ash reuse and recycling options.

Other Recommendations

- Wood-fired facility owners and operators should provide emissions data and test results to public interest groups and others.

- A working group should meet regularly in New York to discuss issues raised by the Roundtable participants.

- Future waste wood combustion working groups should strive to include members from the construction industry (as significant waste wood generators).

- Habitat and biodiversity concerns related to the potential increased demand for harvested wood for fuel should be researched.

- Lessons learned from existing wood-fired facilities should be applied to regulatory and public acceptance issues.

- Given available data on air and ash impacts of waste wood combustion, future research and testing efforts should focus on questions still unanswered from air emissions and ash contents from waste wood combustion.

APPENDIX A: OVERVIEW OF WASTE WOOD PROCESSING AND COMBUSTION ISSUES

1. Waste Wood Generated and Reused in New York State

2. Energy Policy Issues

3. Solid Waste and Recycling Issues - Feedstock

4. Air Quality Issues

5. Solid Waste Management Issues - Ash

6. The Bottom Line About Waste Wood For Fuel

1. WASTE WOOD GENERATION AND REUSE IN NEW YORK

This table lists the types and amounts of waste wood generated, reused, and discarded in New York state in 1990. For an explanation of the categories of waste wood used, consult the definitions listed in Section II.

	NEW YORK STATE		
	GENERATED	REUSED/RECYCLED	DISCARDED
	(Green tons per year, 1989)		
HARVESTED WOOD			
Silviculture	2,040,000	200,000	1,840,000
Site Conversion	4,500,000	500,000	4,000,000
Agriculture	(a)	(a)	(a)
Subtotal	**6,540,000**	**700,000**	**5,840,000**
MILL RESIDUE			
Primary Wood Industry	2,406,000	2,359,000	47,000
Secondary Wood Industry	512,000	468,000	44,000
Subtotal	**2,918,000**	**2,827,000**	**91,000**
URBAN" WOOD WASTE			
Pallets (Used)	317,000	50,000	267,000
C/D Wood	1,795,000	200,000	1,595,000
MSW/Other Wood	210,000	(b)	210,000
Subtotal	**2,322,000**	**250,000**	**2,072,000**
TOTAL	**11,780,000**	**3,777,000**	**8,003,000**
		32%	**68%**

(a) Wood waste from clearing land for agriculture is included in site conversion estimates.

(b) Data unavailable

2. ENERGY POLICY ISSUES

FACTORS AFFECTING WASTE WOOD FOR FUEL

- Federal or state policies defining the use of wood for fuel.
- Whether, and how, Public Utility Commissions and utilities value environmental, economic, and societal costs and benefits of wood and waste wood for energy.

FINDINGS

- The 1 1/2 cent/kWh production tax credit for biomass and wind energy passed by the U.S. Senate and House in 1992 may not assist the direct combustion industry unless the requirement that the feedstock be "exclusively" grown is dropped.
- PURPA-inspired wood-fired power projects are finding it difficult to develop projects at avoided cost rates offered by utilities. The use of no-cost, low-cost, or revenue-producing waste wood can be essential to financial viability.
- There may be a "disconnect" between state energy plans or policies, and the permitting/regulatory climate and process in the same state.

IN NEW YORK STATE

- The 1992 State Energy Plan supports the use of wood for energy and explicitly recognizes wood from the waste stream as a possible fuel source.
- The plan indicates that "achievable contributions" from wood and waste wood may increase from three MW in 1990 to 400-800 MW in 2010.
- There are State financial incentives for using wood for fuel (the Energy Authority Risk Sharing Program; NYSEO Energy Investment Loan Program, etc.).
- Methods for including the environmental, economic, and societal costs and benefits of wood fuel are being considered. The future direction of the PSC and utilities regarding wood is uncertain.

3. SOLID WASTE AND RECYCLING ISSUES - FEEDSTOCK

FACTORS AFFECTING WASTE WOOD FOR FUEL

- Overall need to find alternative methods for managing waste wood.
- History and experience permitting wood-waste processing facilities.
- Solid waste regulatory distinction between clean and treated wood.
- Classification of waste wood for processing, sampling/testing requirements.
- Is processing waste wood for fuel "recycling"?

FINDINGS

- Increasingly, states are banning waste wood disposal in landfills.
- Many recycling planners/activists think using waste wood for fuel is not its highest or best use.
- Most states do not define waste wood processing for fuel as "recycling". Policies and reg's may restrict or prevent waste wood for fuel.
- Fuel specifications are likely to be more specialized for combustion facilities relying on waste wood from multiple off-site sources.
- Most processors believe they can produce fuel-quality material.
- Large power plants are integrating "backwards" into waste wood collection and processing. Facilities that are not, may have additional processing equipment at the combustion site.

IN NEW YORK STATE

- Currently, waste wood feedstock is considered a solid waste. A BUD must be obtained to avoid solid waste permits. The applicable reg's are now being reviewed. A draft is due around 10/93.
- Specific definitions for clean and treated wood are used by the Solid Waste Division.
- Some recycling goals discourage wood from being landfilled.
- Energy recovery of treated wood is specifically <u>not</u> "recycling".
- NYSDED recycling market development efforts are not allowed to address processing wood waste for fuel.
- Waste "control plan" of feedstock is required for clean and treated wood combustion.

4. AIR QUALITY ISSUES

FACTORS AFFECTING WASTE WOOD FOR FUEL

- History and experience permitting wood-fired facilities.
- Classification of a facility according to state air regulations.
- Wood fuel type, specifications, and sampling/testing procedure.
- Level of control and/or equipment considered BACT.
- Effects of 1990 Clean Air Act Amendments.

FINDINGS

- Each state has either developed wood fuel definitions or classifies facilities based on the type of wood fuel burned.
- Permitting is more stringent for treated wood, than clean wood.
- Facilities burning clean wood are usually permitted as energy recovery or resource recovery facilities, not as incinerators.
- Classification and permitting of treated wood units varies among states.
- BACT is required in most states regardless of whether PSD applies.
- BACT is typically more stringent than federal NSPS and state emission standards.
- Add-on controls include ESP's or baghouses for PM, SNCR for NOx.
- "Good" combustion design is typically required for CO and VOC.
- After 11/15/92, new combustors in non-attainment areas for NAAQS will likely require add-on controls and emission offsets for NOX and/or VOC. Attainment and maintenance of NAAQS and permits will be administered by state programs.
- Hazardous Air Pollutants (HAPs) reg's are being written by EPA. MACT is likely to apply to wood-fired boilers.
- All eight states studied have HAP regs that are more stringent than the federal NESHAPS.
- Potential air toxic pollutants include benzene, formaldehyde, acetaldehyde, and trace metals. PAH, dioxin, and furan are also regulated. Data indicate they are not usually detected in significant amounts.

- Each state has developed acceptable ambient concentrations for HAP based on occupational exposure limits or toxicity studies.

IN NEW YORK STATE

- There is experience permitting facilities that burn or would like to burn both clean and/or treated wood.

- There are specific regulatory definitions for clean and treated wood.

- Clean wood combustion is classified as energy/resource recovery, not incineration.

- Treated wood combustion is classified as incineration, not energy/resource recovery.

- Regulators may require inspection of fuel sources and sampling of feedstock.

- BACT levels vary over time and among locations. Of eight states and one province studied, New York was:

  PM - 2nd highest level allowed
  NOX - 2nd highest level allowed
  SOX - 3rd highest level allowed
  CO - 4th highest level allowed
  HC - 2nd highest level allowed

- For treated wood, emissions of concern are lead, other metals, formaldehyde, and other toxic organics. Secondary post-combustion dioxin and furan formation is also a concern.

- Parts of upstate New York are nonattainment for ozone. New or modified emitters of 100 TPY NOX or 50 TPY VOC are subject to LAER.

- NYC is severe nonattainment for ozone. New or modified emitters of 25 TPY NOX or 25 TPY VOC are subject to LAER.

- The rest of New York State is in the Northeast Ozone Transport Region, and are treated as moderate nonattainment.

- CO could also be an issue in some locations.

5. SOLID WASTE MANAGEMENT ISSUES - ASH

FACTORS AFFECTING WASTE WOOD FOR FUEL

- Classification of waste wood ash, sampling/testing requirements, and management/disposal regulations (e.g. beneficial use determination).
- Policies and regulations concerning beneficial uses of ash.
- Potential effects of RCRA reauthorization on classification of ash.

FINDINGS

- Ash from waste wood combustion is not currently defined at the federal level as hazardous.
- Some states require TCLP to test toxicity and leaching.

IN NEW YORK STATE

- Clean waste wood ash is regulated as a solid waste. Disposal of fly ash is regulated separately from bottom ash, combined ash, or treated fly ash.
- An ash management plan is required for clean or treated wood. Waste characterization of ash is required for treated wood but not for bottom ash from clean wood.
- There are regulations for determining beneficial uses (BUD) of solid waste - including non-hazardous treated wood ash.
- A "generic BUD" has been issued for using clean wood ash as a fertilizer or a liming agent. The bottom ash can be disposed in a solid waste landfill. The fly ash must be disposed in a double-lined monofill.
- Non-hazardous treated wood bottom ash can be disposed in either a single-lined monofill or a double-lined solid waste landfill.
- Non-hazardous treated wood fly ash must be disposed in a double-lined monofill.

6. THE BOTTOM LINE ABOUT WASTE WOOD FOR FUEL

(Based on a variety of waste wood processing, combustion, and market analyses completed by C.T. Donovan Associates, Inc.)

- o More waste wood is generated than planners acknowledge.
- o Processing equipment is proven and commercially available.
- o Substantial amounts of waste wood are still:
  - Burned on-site in outdoor piles;
  - Buried on-site;
  - Discarded off-site to illegal dumps; and
  - Discarded, sometimes at high cost, in permitted landfills.
- o Existing processors are struggling for markets.
- o Fuel is one of the largest potential markets.
- o Barriers exist to fuel markets, especially for treated wood.
- o Emissions data indicate many types of treated wood can be burned and meet permits.

PUBLIC SECTOR BARRIERS

- o Waste wood may not be a priority in energy, solid waste, recycling, and regulatory activities.
- o There is uncertainty among regulators about the ability to process and burn waste wood for fuel in an environmentally acceptable manner.
- o There are limited or no methodologies for valuing potential environmental, economic, and societal benefits and costs of waste wood processing and combustion.
- o Processing waste wood for fuel may not count towards recycling goals. State or local policies may discourage it.
- o Limited or no public incentives or quotas to process and use waste wood for fuel or other uses.
- o States may have untested or unclear permitting processes.
- o There can be a lack of coordination and consistency across multiple permitting agencies in the same state.
- o Absence (or misinterpretation) of scientific data may lead to politicized approach.

- There are limited, or no, public incentives or quotas to process and use waste wood for fuel (or other uses).

PRIVATE SECTOR BARRIERS

- Lack of information or incorrect information about the amount of waste wood.
- Limited interest by investor-owned utilities in wood and waste wood.
- IPP's have difficulty competing with avoided costs, and costs for fossil fuel sources.
- Uncertainty about regulatory/permitting process and "climate" discourages new projects.
- Concern about restrictions on the types of waste wood that can be processed or combusted for fuel restrict investments in treated wood processing and combustion capabilities.
- All of the above create difficulty (or high costs) for raising investment capital and financing projects.

APPENDIX B: COMPILATION OF RESPONSES TO PRE-ROUNDTABLE QUESTIONNAIRE

This appendix provides a detailed compilation of responses provided by ten Roundtable participants. The participants represent a variety of public and private sector views regarding waste wood processing and combustion for energy. Some questions are posed in the form of a statement, while other questions provided opportunity for written responses.

SECTION I: BACKGROUND INFORMATION

1. Describe your professional role(s) and the type of agency or company for whom you work:

Professional Role(s)	Type of Agency/Company
_1__ State Planner	_1__ State Energy Office
_2__ State Policy Analyst	____ State Research Office
_2__ Environmental Regulator	_3__ State Regulatory Agency
_1__ Consultant	_2__ Private Company
____ Wood Processing Facility Employee	_2__ Non-Profit Organization
_1__ Wood Combustion Facility Employee	_2__ Other - Describe
____ Financial Analyst or Investor	
_1__ Environmental Activist	
_2__ Other - Describe	

2. Through your professional role(s), have you ever been involved with technical, regulatory, or public policy issues concerning the processing and/or combustion of wood for fuel in New York State? If yes, describe briefly.

Yes	No	NS
9	1	0

3. In your opinion, are there environmentally-acceptable and cost-effective opportunities for processing waste wood for fuel available in New York State today?

Yes	No	NS
6	0	4

- "yes, for processing but not necessarily for fuel"
- "yes, there are strong economic incentives"
- "it is limited due to regulations"
- "not enough information in order to judge"

4. Please indicate whether you agree with each statement below b noting "A", disagree by noting "D", or are not sure by noting "NS".

A	D	NS	
3	5	2	Waste wood processing equipment is ^Qnot^P capable of removir physical and chemical contaminants from treated wood so that it can be burned for fuel and meet existing air emissions and ash environmental standards.
1	1	8	Although equipment exists to process treated wood sufficientl for use as fuel, most processors do not have this equipment.
4	5	1	Facilities that process wood from the waste stream only into fuel (and not into other products) should be considered to b recycling facilities.
0	6	4	Given existing uses for waste wood other than fuel (e.g. landscaping mulch, compost amendment, animal bedding), there i enough demand for processed waste wood in New York without th development of new fuel markets.

Please elaborate on any of the statements above, or note addition issues or concerns below:

R	NR
3	7

(NOTE: R = Responded, NR = No Response)

- "most wood waste markets do not use treated wood"
- "level of non-wood contaminants will also affect the use of wood waste in other end uses"
- "gasification and other combustion technologies make wood waste combustion feasible"

5. In your opinion, are there environmentally-acceptable and cost-effective opportunities for combusting waste wood for fu available in New York State today?

Yes	No	NS
6	2	2

- "yes, but it is case by case to be determined by each applicant"
- "yes, but opportunities limited due to regulations"
- "technically yes, but economically uncertain"
- "opportunities are not cost-effective at this time"
- "not sure, but possibly co-firing at MSW incinerators with BACT control"
- "no, but less of a no for untreated wood fuel"

6. Please indicate whether you agree with each statement below by noting "A", disagree by noting "D", or are not sure by noting "NS".

A	D	NS	
1	9	0	Waste wood combustion equipment is ^Qnot^P capable of removing physical and chemical contaminants from treated wood so that it can be burned for fuel and meet existing air emissions and ash environmental standards.
3	2	5	Although equipment exists to combust treated wood and meet air emissions and ash environmental standards, most wood-fired facilities do not have this equipment.
1	6	3	Given other existing and potential sources of energy efficiency and new energy supplies in New York, the use of waste wood for fuel should not be encouraged.
6	2	2	The use of waste wood for energy should be considered a renewable energy resource, as are wind, hydro, solar, geothermal, and biomass "energy crops".
2	6	2	The combustion of waste wood for fuel should be considered to be incineration and as primarily a waste disposal technique.

Please elaborate on any of the statements above, or note additional issues or concerns below:

R	NR
2	8

- "the potential of emissions of heavy metals and other toxic contaminants is high"
- "lead in painted wood will cause ash disposal problems"

SECTION II: ENERGY POLICY ISSUES

7. What are the most important federal, state, or local energy policy issues affecting opportunities to process and use waste wood for fuel in New York State in the future?

R	NR
8	2

- "unless the environmental downside of burning is addressed... wood burning cannot be considered an easy fuel alternative"
- "payments to independent power producers"
- "conflicting regulations"
- "siting issues"
- "solid waste disposal costs, alternative fuel costs, and PURPA incentives"

8. **What needs to be done to address these issues?**

R	NR
8	2

- "enact recommendations in NYS Energy Plan"
- "fast track permitting program"
- "change regulator's mindset"
- "recognize economic and environmental benefits of wood waste for fuel"
- "make sure utilities pay a fair price to IPP's"
- "discriminate [more specifically] between unadulterated wood and C & D wood waste types"
- "need favorable market incentives"

SECTION III: SOLID WASTE MANAGEMENT AND RECYCLING ISSUES

9. **What are the most important federal, state, or local solid waste management and recycling issues affecting opportunities process and use waste wood for fuel in New York State in the future?**

R	NR
7	3

- "reuse of ash residues"
- "regulatory inconsistency; permitting and citing"
- "impact of chlorinated compounds, PAH's, and dioxins in air emissions; impact of arsenic and lead in ash disposal"
- "need to quantify the types, sources, and contaminants of different wood wastes"
- "how to guarantee fuel quality for regulators"
- "Part 360 regulations are a major barrier to waste wood utilization"

10. **Please indicate whether you agree with each statement below noting "A", disagree by noting "D", or are not sure by noting "NS".**

A	D	NS	
4	3	3	There is limited or no data on the types and amounts of waste wood generated, therefore it is difficult to determine how much untreated or treated wood may be available for fuel.
3	1	6	Existing state solid waste management and recycling policies do not consider the processing of waste wood for fuel to be recycling.
3	3	4	In state solid waste management policy, the processing and use of waste wood for fuel should be considered to be reuse (or diversion), not recycling.
1	7	2	In state solid waste management policy, the processing and use of waste wood for fuel should be considered to be a form of disposal, not reuse or recycling.

Please elaborate on any of the statements above, or note additional issues or concerns below:

R	NR
5	5

- "woodburning does not appear to be recycling
- "reuse or 'diversion to energy production' might be a more apt description"
- "the material is made useful to produce electricity"
- "processing and combustion of untreated wood is considered a 'beneficial use' and would be considered as energy recovery
- "it is 'combustion for energy recovery' and should be #3 on the hierarchy in NY state"

SECTION IV: AIR EMISSIONS AND AIR QUALITY ISSUES

11. What are the most important federal, state, or local air emissions and air quality issues affecting opportunities to process and use waste wood for fuel in New York State in the future?

R	NR
7	3

- "implementation of CAA Amendments,"...[specifically],"Title 1, nonattainment provisions, Title 3 air toxics, and Title V, operating permits"
- "reducing emissions of SOx and NOx, stabilize CO2 and other greenhouse gases"
- "Clean Air Act emissions offsets [in Title 1]"
- "controlling air toxic emissions"
- "same issues as any other fuel type"
- "treated wood combustion cannot be allowed in units lacking sufficient controls, even then, residual emissions must be evaluated"

12. Please indicate whether you agree with each statement below by noting "A", disagree by noting "D", or are not sure by noting "NS".

A	D	NS	
2	4	3	Federal standards for attainment pollutants (e.g. particulates, sulfur oxides, nitrous oxides, and ozone) are the most important issue affecting the combustion of waste wood for fuel.
3	3	4	Federal air toxic standards are the most important issue affecting the combustion of waste wood for fuel.
6	2	2	Fuel quality specifications and contracts for the types of waste wood accepted for combustion are as important as combustion equipment in meeting environmental standards.

4	1	5	State policy should distinguish between solid waste incineration and waste wood combustion because of the differences in combustion performance between MSW incinerators and wood-fired facilities.
1	4	5	Industrial- and commercial-scale wood-fired facilities produc less and/or cleaner air emissions than "large", stand-alone wood-fired power plants.

Please elaborate on any of the statements above, or note additional issues or concerns below:

R NR
4 6

- "measurement of stack emissions is critical determinant"
- "control of what goes in to the plant is equally important"
- "it may be appropriate to distinguish between facilities th use treated and untreated wood"
- "'large' wood facilities may better able to afford precipitators and other pollution control equipment"
- "emission standards based on useful heat or electrical outp rather than heat input would encourage maximum thermal efficiency in disposing of waste wood"

SECTION V: ASH MANAGEMENT AND DISPOSAL ISSUES

13. What are the most important federal, state, or local a management and disposal issues affecting opportunities process and use wood for fuel in New York State in the futur

R NR
5 5

- "whether wood ash is likely to fail TCLP tests"
- "disposal needs and reuse restrictions"
- "heavy metals in ash"
- "the issues are the same as any other type of ash"
- "establishing maximum contaminant levels for ash reuse"

14. Please indicate whether you agree with each statement below noting "A", disagree by noting "D", or are not sure by noti "NS".

A	D	NS	
6	2	3	Ash from treated wood combustion should in all instances be tested for hazardous waste characteristics.
0	7	3	Ash from treated wood combustion should be categorically defined as a hazardous waste in federal and/or state policies.
6	1	3	Ash from treated wood combustion should be used in other products (such as concrete mixes) if the product containin

the ash can satisfy leaching tests and other environmental standards.

2 4 4 Fly ash and bottom ash from treated wood combustion should be managed and handled separately from each other.

Please elaborate on any of the statements above, or note additional issues or concerns below:

R NR
2 8

- "TCLP tests for ash reuse in cement and other products is not realistic"
- "Public assurance of environmental capability calls for initial facility-specific testing and periodic fuel quality monitoring

SECTION VI: THE ROLE OF WOOD IN NEW YORK'S ENERGY AND SOLID WASTE MANAGEMENT FUTURE

15. **Should the use of "clean", untreated wood for fuel increase in New York State in the future?**

If yes, why? If no, why not?

Yes No NS
8 0 2

- "yes, particularly to cut CO2 emissions from fossil fuels"
- "yes, because of solid waste crisis and fuel diversity"
- "yes, to make up for lack of markets for clean wood chips"
- "yes, provided it is burned competently"
- "not sure, recycling alternative for wood should be assessed first"
- "not sure, it should be driven by market forces and include necessary environmental safeguards"
- "yes, it is clean, renewable, and CO2-neutral technology"
- "yes, to the extent it is cost-effective"

16. Should the separation, processing, and use of treated wood for fuel increase in New York State in the future?

If yes, why? If no, why not?

Yes No NS
8 2 0

- "yes, if it can be done in environmentally acceptable way"
- "yes, for the same reasons as untreated wood"
- "use for fuel should not be the only reuse option"
- "most of it is a clean fuel which will otherwise be landfilled"
- "no, unless very good controls are employed, emissions of heavy metals and toxic organics will increase"
- "yes, to provide an alternative to landfilling"

- "not any more, unless distinguish between different types of contaminants"

17. **What are the five most important issues affecting opportunitie to process and use waste wood for fuel in New York State in th future?**

- achieving acceptable air emissions
- meeting ash disposal and reuse standards
- lack of or inadequate power market incentives
- achieving clear regulatory pathways
- generating public support for wood energy
- ensuring good facility operation
- meeting capital requirements and fuel supply needs

18. **What are the five most important activities that need to completed in New York State during the next 1 to 3 yea concerning the potential processing and use of waste wood f fuel?**

- characterizing and quantifying wood waste stream, identifyi waste management needs
- characterize air and ash emissions
- increased testing at existing facilities, identifying NOx, RACT, BACT, and LAER technologies
- commitments to assure fuel quality
- develop information on potential power supply from wood wast
- ensure access to renewables set-aside (i.e. 300 MW); work wi NY PSC for financial incentives
- establish beneficial uses for ash

19. **What (if any) type(s) of information, technical assistance, other services concerning the processing and use of wood f fuel would be most helpful to you in your job?**

R	NR	
4	6	**New research and development on (list the topics):**

- "contaminants in treated wood, especially metals"
- "develop information on wood waste sources"
- "full-scale testing"
- "chemical characterization of ash"
- "chemical characterization of ash"
- "assess emissions controls performance and management"
- "develop fuel from waste wood capacity estimates"

3	7	**Applied research on (list the topics):**

- "analyze emissions compared to other types of fuels"
- "using waste wood as fuel pellets"
- "need for ongoing assessment of wood use and availability"

2 8 **Professional education and training on (list the topics):**

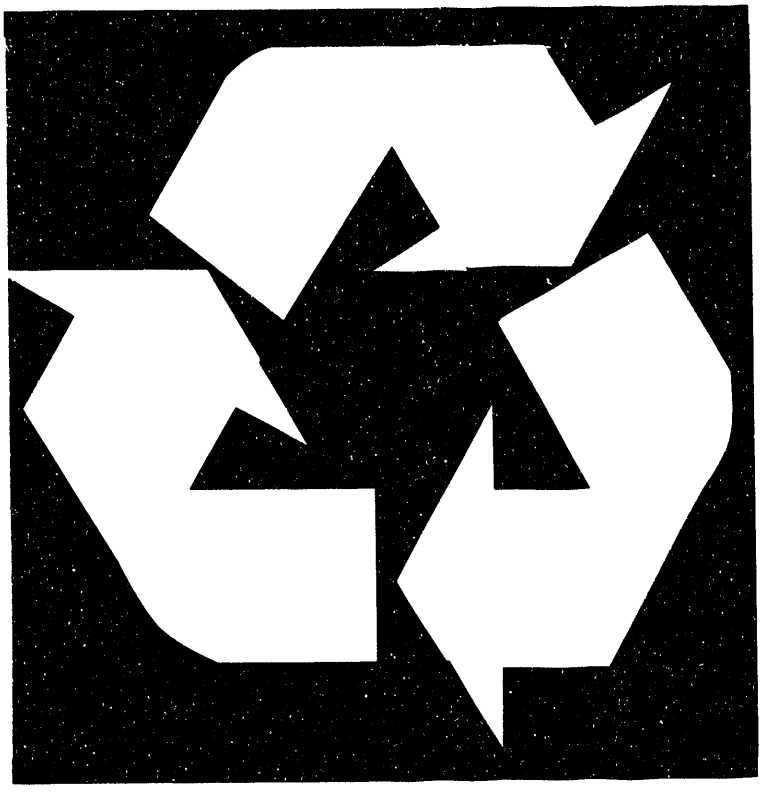
- "more education around economic and environmental benefits of waste wood for fuel"

- "develop case histories of state of the art facilities from an air pollution perspective. Need to know about SNCR performance and combustion practices for CO, VOC, and NOx"

2 8 **Consumer information on (list the topics):**

- "explanation of environmental consequences"
- "waste wood availability"

0 10 **Other suggestions - Describe.**



Waste Wood Processing and Combustion for Energy

Complete Speaker Listing

5th Annual

NATIONAL BIOFUELS CONFERENCE AND EXHIBITION

OCTOBER 19 - 22, 1992

Boston Marriott Newton

Newton, Massachusetts

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National Wood Energy Association (NWEA)

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State and Territorial Air Pollution Program Administrators (STAPPA)

The Combustion Research Laboratory of ERL/CANMET

HOSTS

Northeast Regional Biomass Program

Massachusetts Division of Energy Resources

PURPOSE

Concern about global climate change, increasing air pollution, depletion of forest resources, and limited solid waste disposal capacity is stimulating interest in the environmental impacts of processing and using waste wood for energy.

The 1992 National Biofuels Conference will include the annual national meeting of five Regional Biomass Programs funded by the U.S. Department of Energy. In addition, the conference will present the results of R&D efforts, applied research, technology transfer activities, and environmental policies and regulations concerning the processing and use of waste wood for energy.

The theme of the conference is **"Waste Wood Processing and Combustion for Energy."** More than 50 speakers will address a variety of technical, regulatory, and public policy issues affecting the use of "clean," untreated waste wood (such as forest residue) and treated waste wood (such as plywood, pressure-treated wood, painted wood, railroad ties, and demolition wood) for fuel. Responding to the growing interest in the use of waste wood for fuel in the U.S. and Canada, the conference will address aspects of waste wood processing and combustion not included in other biofuels conferences.

CONFERENCE AGENDA

As the first national conference focussing on waste wood processing and combustion for energy, the conference will:

- Characterize the physical and chemical contents of waste wood potentially processed and used for energy.
- Identify chemicals, metals, and other contents of treated waste wood that affects it's use as fuel.
- Describe waste wood separation, processing, combustion, air emissions, and ash handling equipment that can meet environmental standards.
- Explain federal and state air, energy, solid waste management, and recycling policies and regulations concerning the processing and use of waste wood for fuel.

WHO SHOULD ATTEND

- Regional Biomass Program Staff
- Federal and State Energy Planners and Foresters
- Solid Waste and Air Environmental Regulators
- State and Local Solid Waste and Recycling Planners
- Waste Wood Processors
- Wood Chip and Pellet Boiler Manufacturers
- Wood Gasification Manufacturers
- Waste Wood Generators and Haulers
- Solid Waste Facility Operators
- Biofuels Research Scientists
- Forest Products Industry Owners
- Independent Power Producers
- Electric Utility Planners

REGIONAL BIOMASS PROGRAM ANNUAL MEETING

SUNDAY, OCTOBER 18, 1992

5:00 – 7:00 pm **Registration**

MONDAY, OCTOBER 19

8:00 am	**Registration**
8:30 – 8:45	**Welcome** Philip Lusk, Program Director, Northeast Regional Biomass Program J. Rachel Shimshak, Director, Policy Unit MA Division of Energy Resources
8:45 – 9:15	**The Role of the Regional Biomass Programs in Federal Energy Programs** Harry Lane, Director of the Office of National Programs, U.S. DOE
9:15 – 10:30	**Northwest Region Presentation** Patrick J. Fox, Program Manager, Bonneville Power Administration
10:45 – Noon	**Western Region Presentation** Dave Swanson, Biomass Manager, Western Area Power Administration
Noon – 1:00	**Lunch and Luncheon Speaker** Robert H. Annan, Director, Office of Solar Energy Conversion, U.S. DOE (Invited)
1:00 – 2:15	**Great Lakes Region Presentation** Fred J. Kuzel, Director, Great Lakes Region Biomass Energy Program
2:15 – 3:30	**Southeast Region Presentation** Phillip C. Badger, Manager, Southeastern Regional Biomass Energy Program
3:45 – 5:00	**Northeast Region Presentation** Philip Lusk, Program Director, Northeast Regional Biomass Program
5:00 – 6:00	**Reception**

TECHNICAL CONFERENCE

TUESDAY, OCTOBER 20

8:00 – 5:00 **Registration**

10:00 – 7:00 **Exhibits**

8:30 – 9:00 **Welcome**
Anne Stubbs, Executive Director, CONEG Policy Research Center, Inc., Washington, D.C.
The Honorable William F. Weld, Governor, Commonwealth of Massachusetts; Chair, Coalition of Northeastern Governors

9:00 – 10:15 **Plenary–Existing and Future Roles for Wood Energy**

Biomass in the U.S. Energy Mix
Dr. Ralph Overend, Biomass Power Program Leader, National Renewable Energy Laboratory, Golden, Colorado

Global Outlook for Biomass Energy
Dr. Robert H. Williams, Senior Research Physicist, Center for Energy and Environmental Studies, Princeton University, Princeton, New Jersey

Economic Attributes of Wood Compared To Other Fuels
John (Skip) Laitner, Principal, Economic Research Associates, Eugene, Oregon

10:45 – 12:00 **Plenary–The Dilemmas of Waste Wood For Energy**

Environmental Impacts of Waste Wood Combustion for Energy – Air and Ash
Dr. Richard Atkins, Principal, Environmental Risk Limited, Bloomfield, Connecticut

Key Federal and State Policies and Regulations Affecting Waste Wood for Energy
Christine T. Donovan, President, C.T. Donovan Associates, Inc., Burlington, Vermont

Using Waste Wood for Energy in the Real World
Aaron Samson, Vice-President, Kenetech Energy System, Inc., Meriden, Connecticut

12:00 – 1:30 **Lunch and Exhibits** (No Speaker)

1:30 – 5:00 **Concurrent Sessions 1 and 2 (see pages 3-6)**

5:00 – 7:00 **Reception in Exhibit Area**

WEDNESDAY, OCTOBER 21

8:00 – 5:00 **Registration**

8:30 – Noon **Concurrent Sessions 3 and 4 (see pages 3-6)**

Noon – 1:30 **Lunch with Luncheon Speaker**
"Biomass Inside the Beltway: Federal Issues Affecting Wood Energy"
Scott Sklar, Executive Director, National Wood Energy Association, Washington, D.C.

1:30 – 3:00 **Concurrent Session 5 (see pages 3-6)**

3:30 – 5:00 **Closing Plenary–Future Steps**

The Utility Perspective
Dr. Evan E. Hughes, Manager, Renewable Fuels, Electric Power Research Institute, Palo Alto, California

The Independent Power Producers' (IPP) Perspective
Martin M. Duggan, President, DKF International Energy Associates, Baldwinsville, New York (Past President, HYDRA-CO Enterprises, Inc.)

The Environmental Perspective
Dr. James H. Cook, Scientist, Scully Science Center, National Audubon Society, Islip, New York

CONCURRENT SESSIONS

TUESDAY • OCTOBER 20 • SESSION 1 • 1:30–3:00

BIOMASS COMBUSTION EQUIPMENT: AN OVERVIEW

Direct Combustion Technologies, Roger Bloomfield, P.E. President, Bloomfield Associates, Concord, New Hampshire

Fluidized Bed Technologies, Sheldon Schultz, General Manager, Yanke Energy, Boise, Idaho

New Techniques in Waste Wood Combustion, David Tillman, Operations Manager, Ebasco Environmental, Sacramento, California

WASTE WOOD PROCESSING: FROM BACKYARD SCALE TO STAND-ALONE FACILITIES

Low-Cost Technology Choices for Managing Waste Wood, William Seekins, Maine Department of Agriculture and Rural Resources, Augusta, Maine

Intermediate-Scale Waste Wood Processing Facilities, Peter Logan, President, RE-TECH Inc., Elizabethtown, Pennsylvania

New Directions in Waste Wood Processing, Heidi J. Winzinger, Manager, Winzinger Woods, Hainesport, New Jersey

STATE AIR QUALITY TRENDS RESULTING FROM THE 1990 CLEAN AIR ACT AMENDMENTS

Federal Policies and Regulations Affecting Untreated and Treated Wood, Andrew Otis, Policy Analyst, U.S. EPA, Air Quality Branch, Washington, D.C.

Effects of Non-Attainment Status on Wood Combustion Permitting, Joseph Ulivicus, P.E., Air Management Bureau, Connecticut Department of Environmental Protection, Hartford, Connecticut

Encouraging "Good Combustion Practices" at Wood-Fired Facilities, Allen Hubbard, P.E., Wisconsin Division of Air Quality, Madison, Wisconsin

TUESDAY • OCTOBER 20 • SESSION 2 • 3:30–5:00

COMBUSTION AT THE UTILITY SCALE: UNTREATED VS. TREATED WOOD

IPP's in the Pine Tree State: The Maine Experience, Jim Connors, Senior Planner, Maine State Planning Office, Augusta, Maine

Experience in Expanding Fuel Use from Untreated to Treated Wood, John Irving, Plant Manager, Burlington Electric Department, Burlington, Vermont

Utility-Scale Experience Burning Treated Wood in California, George Wiltsee, President, Appel Consultants, Stevenson Ranch, California

EMERGING WASTE WOOD PROCESSING TECHNOLOGIES

Evolution of Float Tank Technologies, David Forman, President, Recovery Systems Technology Inc., Bothel, Washington

Strategies for Separating Metals, C.T. Martin, Manager, Industrial Magnetics Inc., Boyne City, Michigan

New Screening and Air Classification Systems, Raymond Sherman, Industry Manager, General Kinematics Corp, Barrington, Illinois

PHYSICAL AND CHEMICAL CHARACTERISTICS OF WASTE WOOD FUELS

What Types of Wood Are in the Waste Stream?, Eric S. Palola, Analyst, C.T. Donovan Associates, Inc., Burlington, Vermont

Properties of Shredded Wood Pallets, Dr. Marshall S. White, Professor of Wood Science and Forest Products, Virginia Polytechnic Institute, Blacksburg, Virginia

Characteristics of Yard Waste as a Biomass Fuel, Richard Schroeder, Vice President, Kenetech Resource Recovery, Gainesville, Florida

CONCURRENT SESSIONS

continued

COMBUSTION AT THE INDUSTRIAL SCALE: UNTREATED VS. TREATED WOOD

Issues Affecting the Ability to Burn Waste Wood in Small-Scale Commercial, Institutional, and Industrial Applications, Rick Handley, Energy Conservation Specialist, New York State Energy Office, Albany, New York

Technology Innovations in Industrial Combustion, Leonard Theran, President, G&S Mill, Inc., Northborough, Massachusetts

Air Toxic Sampling Results from Industrial Wood-Fired Boilers, Andre Caron, Regional Manager, National Council for Air and Stream Improvement, Corvallis, Oregon

WASTE WOOD SEPARATION AND PROCESSING STRATEGIES FOR SOLID WASTE MANAGERS

Is Processing Waste Wood for Fuel "Recycling"?, Denise Lord, Director, Office of Planning, Maine Waste Management Agency, Augusta, Maine

Innovative Municipal Strategies for Separating and Processing Waste Wood, Orvil Norman, Manager, Ulster County Resource Recovery Agency, Kingston, New York

Issues Affecting Waste Wood Availability at the State and Local Level, Alex Sifford, Bioenergy Program Manager, Oregon Department of Energy, Salem, Oregon

An Evaluation of Air Emissions from the Combustion of Demolition Wood Compared to Other Disposal Options, Dr. James Houck, Senior Vice President, OMNI Environmental Services Inc., Beaverton, Oregon

STACK RESULTS FROM COMBUSTION OF TREATED WOOD PRODUCTS

Comparison of Emissions from Waste Wood, RDF, and MSW Fuels, Dr. Dwight J. Bushnell, Associate Professor, Oregon State University, Corvallis, Oregon

Emissions from Particleboard, Plywood, and Furniture Scraps, Andrew J. Baker, Chemical Engineer, USDA Forest Products Laboratory, Madison, Wisconsin

Ability to Meet Air Quality Standards When Burning Treated Waste Wood, Michael I. Holzman, Senior Associate, Environmental Risk Limited, Bloomfield, Connecticut

CONCURRENT SESSIONS
continued

WEDNESDAY • OCTOBER 21 • SESSION 4 • 10:30–NOON

EMERGING GASIFICATION TECHNOLOGIES FOR WASTE WOOD RECOVERY

Performance of a Small System Gasifier, Walter H. Zachritz II, Program Manager, Southwest Technology Development Institute, Las Cruces, New Mexico

Field Tests of a Biomass Gasification System, Prab S. Sethi, Project Manager, California Energy Commission, Sacramento, California

The R&D of Biomass Integrated Gasifiers: BIG/GT and BIG/STIG, Carol Purvis, P.E., U.S. EPA Air & Energy Engineering Research Laboratory, Research Triangle Park, North Carolina

Design and Economics of Electricity Production from an Indirectly Heated Biomass Gasifier, Ronald W. Brault, Senior Program Manager, Tecogen, Inc., Waltham, Massachusetts

CHARACTERISTICS AND USES OF ASH FROM UNTREATED VS. TREATED WOOD

Overview of Untreated and Treated Wood Ash Compared to Other Fuels, Peter M. Coleman, Senior Manager, Resource Conservation Services, Inc., Brunswick, Maine

The Environmental Fate of Wood Ash Applied to Soils, John F. Diebel, Marketing and Financial Analyst, Michigan Technological University, Houghton, Michigan

Issues Affecting the "Beneficial Use" Classification of Untreated vs. Treated Wood Ash, Patricia Hannon, Waste Management Specialist, New Hampshire Waste Management Division, Concord, New Hampshire

COMBUSTION CHARACTERISTICS OF WASTE WOOD FUELS

Factors in Waste Wood Fuel Selection, John T. Karakash, Fuel Specialist, CRSS Capital, Inc., Harford, Pennsylvania

Fuel Blending in California Fluidized Bed Facilities, Dara Salour, Associate Mechanical Engineer, California Energy, Commission, Sacramento, California

Potential Benefits of Co-Firing Wood and Coal, Dr. Charles R. McGowin, Technical Manager, Electric Power Research, Institute, Palo Alto, California

WEDNESDAY • OCTOBER 21 • SESSION 5 • 1:30–3:00

FUTURE ROLES FOR MANUFACTURED WASTE WOOD FUELS

Business Opportunities for Wood Pellet Manufacturing, Jack Whittier, Senior Associate, NEOS Corporation, Lakewood, Colorado

Evaluation of Briquetted Wood Waste for Commercial Heating, Andrew O. Lee, President, BMSI Inc., Richfield, Minnesota

Opportunities in Wood Pellet Commercialization, Phillip C. Badger, Manager, Southeastern Regional Biomass Energy Program, Muscle Shoals, Alabama

RADIOACTIVITY IN WOOD ASH

Survey Results of Cesium-137 in Wood Ash, Stewart A. Farber, P.E., Public Health Sciences, Pawtucket, Rhode Island

Wood Ash Radioactivity Testing Program in Maine, Dr. Charles T. Hess, Department of Physics, University of Maine, Orono, Maine

Results of a Health Risk Assessment of Radioactivity in Wood Ash, Peter Valberg, Principal, Gradient Corporation, Cambridge, Massachusetts

NEW MARKETS AND PRICES AFFECTING WOOD ENERGY

Potential Impacts of Externalities Consideration in Biomass Power Planning, J. Sherman Feher, Energy and Environmental Consultant, Englewood, Colorado

Linking Fuel Supply and Wood Energy Projects, David C. Allen, Vice President, Thermo Fuels, Roseville, California

Processing for Multiple Waste Wood Markets, Marc S. Mittleman, Vice President of Marketing, Canadian Eagle Recyclers, Brampton, Ontario, Canada

CONCURRENT SESSIONS SCHEDULE

The titles listed here correspond to the concurrent session titles on pages 3–5

	WASTE WOOD COMBUSTION	WASTE WOOD PROCESSING, ASH CHARACTERISTICS	AIR EMISSIONS, FUEL QUALITY, FUEL MARKETS
TUESDAY, OCTOBER 20			
Session 1 1:30–3:00	Biomass Combusion Equipment: An Overview	Waste Wood Processing: From Backyard-Scale to Stand-Alone Facilities	State Air Quality Trends Resulting from the 1990 Clean Air Act Amendments
Session 2 3:30–5:00	Combustion at the Utility Scale: Untreated vs. Treated Wood	Emerging Waste Wood Processing Technologies	Physical and Chemical Characteristics of Waste Wood Fuels
WEDNESDAY, OCTOBER 21			
Session 3 8:30–10:00	Combustion at the Industrial Scale: Untreated vs. Treated Wood	Waste Wood Separation and Processing Strategies for Solid Waste Managers	Stack Results from Combustion of Treated Wood Products
Session 4 10:30–Noon	Emerging Gasification Technologies for Waste Wood Recovery	Characteristics and Uses of Ash from Untreated vs. Treated Wood	Combustion Characteristics of Waste Wood Fuels
Session 5 1:30–3:00	Future Roles for Manufactured Waste Wood Fuels	Radioactivity In Wood Ash	New Markets and Prices Affecting Wood Energy

SITE VISITS

THURSDAY, OCTOBER 22

8:00 – 8:30 **Registration**

8:30 – 9:00 **Orientation**

9:00 **Site visits leave.** Each will return on their own schedule.

Site visits provide an opportunity to visit and talk directly with the operators of waste wood processing and combustion facilities. All visits originate at and return to the Boston Marriott Newton. The registration fee includes hand-outs and transportation in car pools. Lunch is not included. Preregistration is required. Visits may be canceled, if there are not enough preregistrations.

1. Waste Wood Processing Facility

Recycled Wood Products in Woburn, MA collects, sorts, and processes 35,000 tons of waste wood per year. Approximately half the wood is derived from landscaping and landclearing activities. The other half comes from post-consumer wood waste such as pallets, construction, and demolition wood. A three-stage system sizes and screens wood for three grades of mulch and other markets.

Site Visit Leader: Philip Lusk, Program Director, Northeast Regional Biomass Program

2. Construction and Demolition Debris Processing Facility

Begun originally as a private transfer station, Jet-A-Way, Inc. in Boston has grown to be a comprehensive C & D recycling facility that handles 150-200 tons per day of material including wood, rock, concrete, asphalt, brick, and metal. This is a chance to see how wood waste is separated from other waste materials and how wood separation complements other recycling activities.

Site Visit Leader: Eric S. Palola, Environmental Analyst, C.T. Donovan Associates, Inc.,

3. Wood-Fired Power Plant

View the nearly completed 18 MW wood-fired power plant under construction in Westminster, MA. Developed by Kenetech Energy Systems, Inc., the facility is scheduled to become fully operational later this year. The plant features an enclosed wood fuel storage system, thermal De-Nox, and a unique air cooling system. The plant will burn approximately 150,000 tons per year of harvested wood, mill residue, and clean wood separated from the waste stream.

Site Visit Leader: Christine T. Donovan, President, C.T. Donovan Associates, Inc.,

4. Industrial Wood-Fired Boiler

Visit the Rex Lumber Company in Acton, MA to view a 212 horsepower boiler installed in 1989 by G & S Mill, Inc. of Northborough, MA. This pile burning system uses a unique zoned-grate design that produces low bed turbulence and minimizes fly ash production. The boiler burns up to 1200 pounds per hour of mill residue and sawdust at 10% moisture and is used for kiln drying.

Site Visit Leader: Irving Sacks, Program Manager, MA Division of Energy Resources

HOTEL INFORMATION AND RESERVATIONS

The conference will be held during peak foliage season at the Boston Marriott Newton, conveniently located 20 minutes from Logan International Airport. The first class hotel is located on the Charles River and features an outdoor riverside recreation path, indoor exercise spa, and gameroom. Paddle boats, a horseshoe pit, and canoes are available. The hotel is located near the intersection of Route 128/95 and the Massachusetts Turnpike in historic Newton.

A block of rooms have been set aside at the hotel in the name of the "National Biofuels Conference." A special conference rate has been arranged of $99.00 per night single or double occupancy, plus 9.7% hotel tax for Saturday, October 17 through Wednesday, October 21. This special rate only applies to room reservations made prior to September 25. Be sure to note you are with the "National Biofuels Conference" to receive the special rate. The hotel expects to be full, so reservations should be made early. Make your own hotel reservations by contacting the:

Boston Marriott Newton

Commonwealth Avenue at
Route 128/95 and the
Massachusetts Turnpike
Newton, Massachusetts 02166
(617) 969-1000
(617) 527-6914 FAX

Handicapped Access

The hotel is accessible to wheelchairs.

Conference and Exhibit Registration Refunds

Requests for conference and exhibit cancellations must be made in writing and sent to the conference office. Each conference or exhibit booth cancellation will be charged a $50 handling fee. Each site visit cancellation will be charged a $15 handling fee. No refunds will be made for requests received after October 1.

Information

National Biofuels Conference
P.O. Box 5665, 22 Church Street
Burlington, Vermont 05402
(802) 658-9385

Organized by C.T. Donovan Associates, Inc.,
Burlington, Vermont

EXHIBIT BOOTHS

Exhibit booths are available Tuesday, October 20 for waste wood processing and combustion equipment manufacturers and retailers, engineering firms, environmental consultants, public agencies, and public interest organizations.

The exhibit hall is located immediately adjacent to the main meeting room used for the plenary and concurrent technical sessions. The exhibit will feature approximately 15 exhibits, available on a first-come, first-served basis. The exhibits will be open for viewing from 10:00 am to 7:00 pm. The space will be available for setting up beginning Tuesday at 7:00 am. (The space will not be available for setting up prior to this time.) All exhibits must remain set up until 7:00 pm and must be taken down by no later than 10:00 pm.

Each exhibit booth is 8' x 10'. The exhibit registration fee includes the cost of a Basic Booth Set-Up. The set-up includes two 3-foot side drapes, one 8-foot back drape, one 6-foot skirted table, two folding chairs, one waste basket, and one booth identification sign. Set-up and take-down costs for these items are included in the exhibit registration fee.

Each exhibit registration also includes two exhibit admissions, two conference packets, and two box lunches provided at your exhibit at noon on Tuesday. The admission applies only to the exhibits on Tuesday, October 20. Conference attendees will be encouraged to visit the exhibits during the lunch break. Due to space limitations, exhibitors will not be served lunch in the luncheon room for conference attendees.

The exhibit registration fee does not include additional items and services available from the Pipe and Drape Vendor. Examples of items not included in the exhibit registration fee include additional labor for set-up or take-down, handling and storage of equipment, extra tables, chairs, signs, counters, easels, etc.

Registered and paid companies will be sent a confirmation letter and map of the exhibit space by the conference staff. A more detailed exhibitor service kit will be sent by the Pipe and Drape Vendor 30-40 days before the conference. The kit includes items and services available from the Pipe and Drape Vendor not included in the Basic Booth Set-Up and a form for ordering electrical service from the hotel.

Exhibit tables are available Monday, Tuesday, and Wednesday for non-profit organizations and public agencies with representatives registered for the conference. The tables will be located in the hallway outside of the meeting rooms and will be available on a first-come, first-served basis. The tables should be used for self-standing displays or displays of information, reports, and other publications.

CONFERENCE REGISTRATION

Each conference registration includes admission, one conference packet, and lunch for one person. An early registration discount is available for registrations postmarked by August 31.

Name _____ Title _____

Company _____ Address _____

City _____ State _____ Zip Code _____

Telephone _____ Fax _____

For multiple registrations, provide the name, address, and telephone of all additional registrants.

		Postmarked *by* August 31	Postmarked *after* August 31
Regional Biomass Program Meeting– Mon., Oct. 19	_____ Registration(s) at	_____ $75	_____ $100
Technical Conference– Tues., Oct. 20 and Wed., Oct. 21	_____ Registration(s) at	_____ $150	_____ $200
Regional Meeting and Technical Conference– Mon., Oct. 19 through Wed., Oct. 21	_____ Registration(s) at	_____ $175	_____ $250
Site Visits– Thurs., Oct. 22	_____ Registration(s) at	_____ $25	_____ $45

1st Choice: #____ 2nd Choice: #____ 3rd Choice: #____

Send check or money order only. Credit cards are not accepted. **TOTAL ENCLOSED** _____

Make check or money order payable to the "National Biofuels Conference" and mail to the:
National Biofuels Conference • P.O. Box 5665, 22 Church Street • Burlington, VT 05402
_____ I can not attend, but keep me on the list for future conferences on similar topics.

B2

EXHIBIT REGISTRATION

Each exhibitor registration includes one 8' x 10' booth with the Basic Booth set-up, two exhibit admissions, two conference packets, and two box lunches. The admission applies only to the exhibits on Tuesday, October 20. Due to space limitations, exhibitors will not be served lunch in the luncheon room for conference attendees.

An early registration discount is available for exhibit booth registrations postmarked by August 31.

Name # 1 _____ Title #1 _____

Name #2 _____ Title #2 _____

Company _____ Address _____

City _____ State _____ Zip Code _____

Telephone _____ Fax _____

If a second person will staff your booth, include their name and title above.

		Postmarked *by* August 31	Postmarked *after* August 31
Exhibit Booth(s)– Tues. Oct. 20	_____ Registration(s) at	_____ $250	_____ $300

Send check or money order only. Credit cards are not accepted. **TOTAL ENCLOSED** _____

An exhibitor confirmation letter and map will be sent upon receipt of payment.

An exhibitor service kit will be sent 30-40 days before the conference.

Make check or money order payable to the "National Biofuels Conference" and mail to the:
National Biofuels Conference • P.O. Box 5665, 22 Church Street • Burlington, VT 05402
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