Report of the Committee on Sawmill Biomass

December 31, 1999

January 4, 2000

Representative G. Steven Rowe, Speaker
Maine House of Representatives

Senator Mark W. Lawrence, President
Maine Senate

Hon. Angus S. King, Jr. Governor
State of Maine

Dear Governor King, President Lawrence, and Speaker Rowe:

The Committee on Sawmill Biomass created by Legislative Resolve HR 1583, with members appointed by the Governor, the House Speaker, and the President of the Senate respectfully submit for your consideration its final report.

The Committee conducted it deliberations over six meetings held in various locations around the state. In addition to the Committee's deliberations, we accepted testimony and participation in committee discussion by a number of representatives of sawmill and biomass power businesses, industry organizations, and others during the course of the committee's work.

We commend for your consideration and action a number of recommendations, that if enacted, would help to alleviate the problems of the sawmill industry at the loss of biomass power markets for their mill residues. We encourage your strong support of the recommendations presented in this report.

Respectfully;

Senator Richard J. Carey, CO-Chair

Representative Charles C. LaVerdiere, CO-Chair

COMMITTEE ON SAWMILL BIOMASS
Joint Order, HP 1583

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Ex Officio

Steve Ward, Public Advocate

Angela Monroe, Public Utilities Commission, Chair Designee

Staff: Jim Connors, State Planning Office

Background

Late in the first session of the 119th Legislature members of the sawmill industry brought to the attention of the Governor and Legislative leaders their concerns about the dire consequences that would occur if the biomass power plants ceased operations as a result of increasing competitive pressures in the electric generation industry. Sawmill operators pointed out their established dependency on the existence of biomass fueled power plants as essential markets for mill residues that could not find a higher value use. If the biomass power plants ceased operations they would lose a valuable market for their mill residues. Worse still, with no viable alternative market, and facing limited disposal options, the cost for proper and acceptable disposal of large volumes of mill wastes would drive the sawmills out of business.

Over the past twenty years an almost symbiotic relationship has become established between sawmills and the biomass power plants. Sawmills have come to rely on the existence of biomass power plants to provide a market for mill residues for use as boiler fuel, while the biomass power plant operators have shifted to a greater use of these residues as a lower cost fuel source. The biofuels market for many mills is a crucial element in the options available to handle the various types of mill residues they produce. The biomass power industry is now confronting major changes and uncertainty as power contracts end and new competitive forces become established. These independent power producers continue to make critical adjustments to keep operating costs as low as possible, and to position themselves to be competitive producers of electricity.

The extended closing of the AVEC Plant in Fort Fairfield, and curtailed deliveries of mill residues to the Sherman Wheelabrator plant came as a clear warning of what the future could be if the biomass power market disappeared. Sawmill operators that felt the impact of these shutdowns first hand began to express their concerns to Administrative and Legislative leaders, suggesting that the situation was a product of public policy, that in turn should be solved through public policy actions.

All participants in the discussion of the issue acknowledge that the existence of a biomass power industry in Maine is the direct result of Federal and State energy policies put in place in the late 1970's. These policies (PURPA and Maine's Small Power Production Act) were established to encourage the development of indigenous renewable energy sources, and were successful in creating an independent power industry at a time when traditional sources of power were expected to be more costly to develop or purchase. But, by the mid-1980's these indigenous renewable sources of power become more costly than other power sources, creating a burden in electricity rates for the higher than market priced electricity that was being provided under long term fixed priced contracts with non-utility generators. With enactment of the Electric Industry Stabilization Act in 1994, the Legislature put the "moral obligation" of the State behind a low

interest fund to support utility buyouts and buydowns of their contracts with non-utility generators. The expressed purpose of the 1994 Legislation was to reduce electricity cost and to keep Maine's renewable generators in production. Today most of the remaining PURPA inspired generation contracts have been bought out or renegotiated, reflecting prices much closer to current market price. However, the cost of these power contract obligations continue to accrue to the ratepayer in the form of stranded costs. In the Electric Industry Restructuring Act of 1997, the Legislature once again enacted public policies designed to ensure the existence of at least some of the established renewable power industry in Maine by creating a supply portfolio requirement for retail electricity sales. These repeated actions of public policy to encourage and maintain biomass power generation have come at a cost to electricity ratepayers in the form of higher electricity costs than alternative market sources. From the perspective of sawmill operators, investments they made to handle and deliver mill residues as boiler fuels for the biomass power plants were made on the basis of a good faith reliance on public policy support for the biomass power plants.

At a meeting with the Governor, all parties expressed a common goal to find a way to resolve the problem. Sawmill operators stressed the importance of maintaining a viable biomass power industry in order to keep available markets for waste materials. The biomass power plant owners expressed great uncertainty in their future as contractual arrangements expire and they face a changing competitive environment. The State Planning Office expressed its concern about losing the economic and environmental benefits associated with both industry sectors.

With the specter of major sawmill closings, as well as the prospects for the loss of the biomass power plants, the Administration and Legislature acted to confront the problem by creating the Committee on Sawmill Biomass. The committee was charged to ...

"The committee shall investigate opportunities for maintaining markets for the sawmill biomass industry that will enhance the sawmill industry in the State, maintain employment and strengthen rural economies. The committee shall also study barriers to sawmill biomass markets and identify appropriate activities to promote existing or new products."

This committee has explored the opportunities for maintaining existing markets for mill residues, especially the biofuels markets; as well as considering potential alternative markets for mill residues currently being used as power plant fuel. In the end, the Committee's objective is to find a solution that will help alleviate a potentially catastrophic mill waste disposal problem for the sawmills.

Perspectives and Positions on the Issues

The Sawmill Industry

The sawmill industry sees the current situation occurring as a result of past public policies that encouraged, even demanded, the creation of biomass power plants that would operate on the basis of the ample supply of lower cost fuels available from the mills, while at the same time the DEP has revised waste management rules, predicated on the enduring existence of an energy market, that result in severely limited and expensive disposal options.

The sawmills have become very dependent on the existence of biomass power plants to provide viable market opportunities for the sale of mill residues. Any loss of these markets would have a negative economic ripple effect back through the trucking companies to the sawmills, creating a very expensive waste disposal situation that could force mills to close. An estimate prepared by the Irland Group for the Maine Forest Products Council found that potential waste disposal costs could be as high as $60 million.

Sawmill operators would prefer to have the biomass power plants remain in business, thus continuing to provide markets for mill residues. In the current discussions, they recognize that some adjustments in residue prices will be a necessary part of a solution, but they state as a business they can not tolerate expensive disposal cost for mill wastes.

The Biomass Power Industry

The biomass power industry acknowledges that any action that will lower fuel costs would have a positive effect on the ultimate competitiveness of individual plants. But, they face other much more problematic issues related to the structure and functioning of the electricity market in a restructured environment. The industry is interested in any solution that will help them remain in production, and in fact individual plants are making adjustments in preparation for competition, including finding lower cost fuel sources.

In the context of this committees work, industry representatives maintain they are not looking for a subsidy or expensive fix at the ratepayers expense, but are very concerned about the ability of Maine based generators to competitively serve state and regional markets. Thus, they are pursuing issues related to the ability of Maine biomass power plants to compete in the changing electricity market.

The Public Utilities Commission

As Commission Chair Tom Welch pointed out at the first meeting of the Committee, this crisis should not be seen as the result of restructuring the electric utility industry. Rather, the situation is an historical convergence of events, beginning with the winding down of power contracts with non-utility generators that is intersecting with the restructuring of the electric utility industry. Since the crisis is not the result of restructuring, it is thus not necessarily a

"utility" problem. In fact, the situation is brought on by the dependency created in the business relationships that have become established between sawmills selling residues as lower cost fuels to independently operated biomass power plants. Thus the solution should rests not with utility regulation or the rate payers but with public policies enacted to solve the sawmill's problems in ways that best serve the interests of all taxpayers.

The position of the PUC is that the Commissions' first interest is to ensure that rate payers are not burdened unnecessarily by costly solutions, and that the Commission has very little control or influence over the events and factors contributing to the crisis, but is concerned enough to work to find a solution with positive outcomes for both industries.

The Public Advocate

The Public Advocate stated for the record that his involvement and interests with this Committee is to protect the best interests of the electricity rate payer, which means fending off any solution that would result in increasing electricity prices to consumers.

The State Planning Office

The State Planning Office, representing the interests of the Governor's Office, expresses deep concern for the well being of both the sawmill and biopower industries, recognizing the significant economic, energy, and environmental contribution they each make especially in rural Maine communities. The interest of the SPO is to find a solution that solves the sawmills problem, and helps the biomass power plants remain in business without unduly raising electricity prices.

Department of Environmental Protection

The DEP is responsible for protecting the land, air, and water quality for the health and well-being of all citizens of the state. The Solid Waste Division has revised the State's rules for waste management as they relate to sawmill residues, to accommodate both the need for short term on-site storage and for on-site disposal in a landfill. These rules have been worked out with the participation of an industry committee, with an eye to simplified standards for projects involving six acres or less. From the perspective of DEP, a sound market outlet for mill residues is a critical part of any waste management solution, not a roll back to more polluting disposal methods.

Understanding the Sawmill Industry

Maine's wood products industry is comprised of several sectors, including sawmills which perform the "primary" breakdown of round logs into studs, lumber, and other sawn products; the "secondary" wood based product manufactures who convert sawn materials into "value added" products for sale or further processing; the pulp and paper industry; and other forest based products such as Christmas trees and maple syrup.

The sawmill industry includes manufacturers of dimensional construction materials like studs and timbers, the production of white pine lumber, and hardwood mills that convert logs and bolts into lumber and planks for further processing and assembly into such products as pallets and furniture stock. Other large "wood processors" that convert raw logs into end use products are oriented strand board (OSB) plants, birch turneries, and wood-to-energy facilities.

All of these mills are consider primary manufacturers by the Maine Forest Service in its annual survey of wood processors. The MFS counts 238 sawmills, 56 wood to energy facilities, 10 pulp and paper mills, and 45 whole tree chippers in its wood processor database. In 1998, the sawmills alone processed 1.2 billion board feet of saw logs, which yielded an unmeasured quantity of residues. Based on their annual data gathering, however, the MFS estimates that Maine sawmills produce about 3.5 million tons of residues for subsequent sale (in addition to wastes and residues used on-site, usually for energy), most of which finds a use as pulp quality chips, biomass fuels, landscaping materials, on-farm uses, and for composting operations.

The MFS reports (see Appendix C for a complete presentation of the information that follows) that the 56 wood-to-energy facilities "processed" (consumed) 3.8 million tons of fuel in 1998, which was purchased in the form of "hog fuel" sawmill residues (2.0 million tons, 53% of total fuel mix), and whole tree chips (47% of the fuel mix) produced directly from forest harvesting operations. Of the two million tons of sawmill residues used as wood fuel in all energy facilities, 1.3 million tons of hog fuel material was purchased from Maine sources, and 0.7 million tons was imported from out of state sources.

Looking more closely at the wood-to-energy sector, the MFS counts eleven stand-alone biomass power plants, 37 sawmills with co-generation facilities, and ten P&P mills with co-generation facilities in its inventory of energy facilities. In 1998, the ten stand alone plants consumed 1.9 million tons of wood fuel, of which 894,000 tons (47% of the fuel mix) was mill residues, of which 472,000 tons was obtained from Maine sawmills. Thus the balance of Maine mill residues(778,000 tons) used as biomass fuel goes to co-generation facilities, which comprises the largest market share for mill residues. These figures show that it is not just the stand alone plants that are important in maintaining a biofuels market.

So the "problem" for Maine sawmills, vis-a-vis the stand-alone biomass power plants, amounts to about 500,000 tons of mill residues that would need to find a use if the stand-alone power plants were to cease operations. This smaller volume of wastes makes the crisis more manageable and the solution, therefore, can be more a targeted. One dealing with the problem where and when it might occur. The waste crisis is really a significant problem for only those

mills currently selling to specific biomass plants that might go out of business. In contrast, if the waste disposal issue involves all of the mill wastes currently be sold as boiler fuel, then the problem is one of finding a use for 1.3 million tons of mill residues currently being consumed by all the wood-to-energy facilities.

Collaborating data on the volume of mill residues is provided by the MFS's 1999 Sawmill Residue Survey. This survey reports results from 107 mills, which accounted for 83% of statewide sawmill consumption of raw wood processed. These mills report the production of 2.675 million tons of residue materials in the form of slabs and edgings (48%), bark (20%), mixed materials (18%), and sawdust (14%). Geographically, the areas with the largest quantities of residues were Aroostook Co., Penobscot Co., Somerset Co., and Oxford Co. The market destination for these residue materials was reported as pulp chips (48%), fuels (34%), landscape materials (14%), compost/bedding (4%), and stockpiling (less than 1%). This partial survey of mills found 909,000 tons of residues headed to fuel uses, which is consistent with the 1.3 million ton figure reported above by the MFS as their measured volume of mill residues consumed annually in all wood to energy plants. (all figures exclude on-site self consumption of wastes for energy).

The Irland Report

In a study commissioned by the Biomass Committee of the Maine Forest Products Council, the Irland Group prepared a report on the financial impacts that might be associated with the closing of biomass power plants that provide a significant market for mill residues. The data and perspectives presented in the report are the results of a survey of biomass plant operators, sawmill operators, and the consultants' knowledge and experience.

A phone survey of five operating biomass power plants found that these plants purchased 875,000 green tons of byproducts from sawmills in 1998. This finding is consistent with MFS reports. The study does not differentiate between Maine sources and imported sources.

Irland reports that Maine sawmills realized an estimated $7.1 million in sales of "materials sold to others" as fuels. Working with 21 mill operators, Irland determined that the unit value of the material FOB (including transportation cost) to be $8.10 per ton. In contrast, the SPO in a 1992 study found wide variation in the price of mill residues, ranging from $0 - $5/ton for small periodic deliveries to $15/ton for regular delivery of substantial volumes.

The report goes on to relate that this loss of revenue is only part of the possible impact on a sawmill. Should the mills be compelled to dispose of mill residues currently going to power plants they could face additional disposal cost estimated to range from $45/ton to $60/ton, which would result in a financial loss to the industry of $46 to $59 million dollars.

In a discussion of alternative markets, the Irland Group relates there is little basis for any confidence that alternative markets for sawmill byproducts would develop quickly. Any likely alternative markets will have raw material specifications that might be difficult for sawmills to

meet with the lower quality and variable characteristics of the materials now sold as hog fuel. This would be particularly difficult for smaller mills. The Irland Group is aware of a number of longer term possibilities for new plants to locate in Maine that could use some volume of sawmill byproducts, but they fail to see any in the near term that would absorb any major share of the current biomass plant consumption.

In a worst case scenario, the Irland analysis assumes the loss of four biomass power plants, which in turn takes with them 16 sawmills. Employment losses and lost wages could total $15 million, plus the ripple effect on other businesses and jobs, as well as lost tax revenues for towns where the plants are located.

In the report, Irland compares the immediate loss of $7.1 million in mill sales revenue to current payroll levels of $1.6 million. A more appropriate comparison would be to compare these losses to the value of product sales. In this case, according to the 1996 Census of Maine Manufactures published by the Maine Department of Labor, the value of products shipped by Sawmills & Planning Mills (SIC 2420) is $427,808,847. Thus the 7.1 million dollar loss is not as significant, but still a substantial loss.

Summary

In summary, the dependency of Maine sawmills on stand alone biomass power plants to handle their mill residues is currently less than 500,000 tons. And at a maximum, the volume of mill residues used in all wood-to-energy facilities is 1.3 million tons on an annual basis, according to MFS figures. According to the Irland Report, if current biomass power markets closed there would be 875,000 tons of material, with a worth of $7.1 million, looking for a new market or requiring some costly disposal action.

Understanding the Biomass Power Industry

The biomass power industry, at its zenith in 1992, was comprised of twenty two (22) wood fueled generation facilities operating under some form of contract or agreement to generate electricity for a "host" utility. In 1992, these facilitates provided 540 megawatts of contracted capacity, and generated over three million megawatt hours of electricity accounting for nearly 25% of the state's consumption. By 1999, utility contracted capacity was significantly reduced, with utility purchases amounting to about two million megawatt hours, which is still about 23% of statewide consumption.

The biomass power industry is comprised of two types of generators. There are ten independent stand-alone facilities, of which seven continue to generate on reduced capacity and operating schedules. The two Maine Energy plants operated by Ridgewood Power are maintained in standby condition and have operated intermittently during summer power shortages. One additional biomass power facility is closed, but could still be potentially available.

The second type of generators are the power facilities situated as co-generation facilities in pulp and paper mills, and sawmills. The P&P co-generation facilities are relatively large generators that are operated to meet mill requirements for energy and to sell excess generation into the grid. There are also several very small co-generation facilities located at some of Maine's larger sawmills and wood processing plants that today are mostly out of the business of selling electricity to a utility.

As committee members and others have stated, each biomass power facility is unique. Each plant was developed within its own set of circumstances that included considerations of the power requirements of the utility, its location in the grid, the availability of fuel supply, and the combustion technology available. Each plant is configured in size and location to account for these considerations and others. One factor all biomass power plants have in common is that they operate the best, in terms of thermal processes and air discharge emissions, when they are run at design capacity on a regular schedule, making them ideal as so called base load facilities.

Similarly, the business circumstances, contract obligations, and financial condition are unique for each plant, making it very difficult to project on an industry level how these plants will fare in the new competitive environments. In general, the initial capital cost for biomass power plants have been paid off, but resale of a plant establishes new debt. Fuel cost have been stable and declining on a inflation adjusted basis over the history of the industry. If the plants continue to be operated efficiently and well maintained they can be a reliable part of a mixed resource base for electricity supply in the state.

Hurdles Facing Biomass Generators

In commenting to the Committee, Beth Nagusky, Executive Director of the Independent Energy Producers of Maine, offered a list of the challenges facing the biomass generators as they

enter a competitive electricity market. She identified the following issues related to the emergence of new markets:

1. **Pancaked Rates.** Maine's biomass (and hydro) generators that are located on transmission facilities that have not been designated pool transmission facilities (PTF) by NEPOOL have to pay a local transmission charge to Maine utilities in order to get their power to the PTF network for sale out of state.

2. **Fuel Costs.** The cost of wood wastes and other wood-based biomass fuels are higher than current prices of fossil fuels.

3. **Stand-by Rates.** Maine biomass facilities mainly export power to the grid. However, if there is a power outage or they need to do maintenance, they need power from a utility to restart the unit. These are not frequent occurrences, but if the biomass plant needs to restart during certain months and hours, they must pay a demand charge not only in the month they need the power, but for the subsequent eleven months.

4. **Standard Offer may Preclude Green Markets.** It was hoped that biomass generators would have a niche in regional renewable/green markets. However, recent experiences in California, Pennsylvania, and Massachusetts--three states that implemented restructuring before Maine--show that setting the standard offer artificially low (California and Massachusetts) prevents competitive markets from developing and suppliers from entering.

5. **Maine's Renewable (and Efficient) Portfolio Standard is overly inclusive.** Currently, about 50% of Maine's power is generated from indigenous renewables. Maine adopted a 30% RPS in its restructuring bill to ensure the health of Maine's existing renewable generators. Even though the Utilities Committee made some real improvements to the RPS this past session, it still appears as if it will not help biomass generators as much as intended.

6. **Customer Disclosure Treats CO2 Emissions from Biomass Like Coal Emissions.** In March, every Maine electric consumer will begin receiving a disclosure statement with their bill showing not only the rate they are paying, but the mix of fuel they are purchasing and the emissions from that fuel. Carbon dioxide (CO2, the primary greenhouse gas) emissions from biomass plants will be treated just like emissions from fossil fuel plants. This may discourage some competitive renewable or "green" suppliers from purchasing the output of these plants.

The Emerging Electricity Marketplace

The Committee received a considerable amount of testimony and comments on a variety of issues and concerns about the circumstances and conditions that will exist as the biomass power plants move into a more competitive environment. To a great extent, an environment being defined by state and federal actions to restructure the electric utility industry. The real challenge facing the biomass power plants is figuring out what it is going to take to be competitive in the new electricity markets. Some hints or even components of that challenge are

already apparent in the marketplace, based on new rules and other requirements being set for generators to participate in the New England market.

Perhaps fundamental to biomass power plant competitiveness, and certainly a key concern for the Committee, is understanding the economics involved in the generation and sale of Maine based biomass electricity. Although hard numbers are scarce, and the early market prices for electricity are preliminary and certainly bound to change as the restructured market shakes out, the following material is presented in an attempt to address the Committee's questions about the competitiveness of biomass power plants.

On the generation side (as contrasted with the retail market side) of the competitiveness issue is the question of the cost of producing electricity from biomass fuels in Maine, in which fuel prices can play a critical role. Bill Short of Ridgewood Power in testimony to the Committee demonstrated the importance of lower fuel cost to his company's ability to produce competitively priced power. He stated that for the Maine Energy plants (which can only burn up to 20% mill residues, the rest is whole tree chips) to be competitive in a marketplace paying $0.045 per kWh he would need to have production cost of $0.03 per kWh, which would require a reduction in fuel cost to zero or even to the point of charging a small tipping fee to accomplish. With this example he points out that it is important to keep in mind that there is a 1.5 cent per kWh differential between the retail market price of electricity to the consumer and the wholesale price paid to the generator of that electricity.

In responding to a direct inquiry by the Committee about generation costs and a break-even market price, Beth Nagusky stated that the operational circumstances and economics for each plant varies, even if she could share proprietary information. She stated that her members feel that a zero fuel cost would make a meaningful contribution to the competitiveness of their power plants.

Some sources familiar with the biomass power industry report that biomass power generation, under current fuel and operational conditions, is selling at 2.8 to 3.5 cents per kilowatt hour. The lower figure is a short term below cost rate set for short periods, with the higher figure being the current "market price" for generators in Maine selling biomass electricity outside of any QF contract obligations . In the opinion of one industry observer (Ken Borneman, KenEnergy Services), in the short term, while markets become created and adjust, generators will be able to deliver electricity in the 3.3 to 3.5 cent per kWh range, although the break even point (all cost, with no profit) for plants may be closer to 4.0 to 4.5 cents range. In addition, FERC Form One Reports from the initial years of operation of the AVEC plant under CMP ownership show the production costs from 1995 through 1998 range from 3.41 to 3.55 cents per kWh, which indicates an average production cost of 3.5 cents per kWh. Thus, these "wholesale" prices may represent a break-even short term generation cost, that can at least serve as a benchmark figure for the Committee to use in judging the magnitude of any subsidy to maintain the competitiveness of biomass power plants. In general, these market figures are above the average market price of 2.85 cents for wholesale generation purchases established in the NEPOOL control area during the April to October period in 1999. Market prices fluctuate daily and

seasonally, so there is great risk in using these number for final decision making, but they do indicate the current pricing situation.

On the market side of the equation, some idea of the new retail prices for electricity in Maine is evident from the recent decisions by the Maine PUC to accept bids for standard offer services, at least for some customer classes. For residential customers the established rate in the Maine Public Service territory is 4.2906 cents, in the Bangor Hydro area it is 4.5 cents, and in the Central Maine Power service area it is 4.089 cents. In a related decision linked to the approval of the standard service provider for CMP customers, the Commission accepted a bid of 2.79 cents as the levelized price for CMP "owned" generation from QF Contracts and other sources. While this price is an average for a variety of sources, it does suggest the current wholesale price for renewable generation sources in Maine when linked with retail sales.

So what is the price structure in which biomass power plants can successfully compete? The answer is extremely unclear, lacking any specific data from the industry, but in general with wholesale market prices for biomass power in the 2.8 to 3.5 cent range, and production cost in the 3.5 cents range, it appears that market prices for biomass generation are below even short term break even production costs and certainly below the level of prices needed for longer term business success. Given these conditions, significant adjustments in operating cost and market prices appear to be needed to assure the continued viability of the biomass power industry.

In considering an action to subsidize biomass power generation as a mechanism to keep the power plants in operation, the Committee discussed using a systems benefit charge applied to all electricity customers to buy down generation price. This action would pay for the difference between generation costs and market prices, which would enable subject plants to offer their product at the prevailing competitive price, other factors being equal. If the current gap between the wholesale price of biomass electricity (2.85 cents), and a break even cost of 3.5 cents is 0.65 cents per kWh then the required subsidy could be in the 1.0 cent range. Applying figures provided by Steve Ward for the amount of generation that might need to be subsidized the total cost would be less than $17 million for this level of support.

Again using figures provided by the Public Advocate, when these subsidy costs are spread across all electricity sales, as a ratepayer burden, in residential and small commercial classes, the additional cost required to raise $15 million is $.002113 per MWh, which for a typical residential customer would add $1.27 to the monthly bill.

Problems with Access to Competitive Markets.

In addition to consideration of the competitiveness of biomass power plants on the basis of production costs, Maine generators face significant hurdles getting biomass power into the northeast market. A variety of additional costs are associated with meeting the requirements to join and participate in the regional grid, as well as satisfying certain ongoing operational requirements. Maine located generators are facing additional transportation costs, and potential congestion charges which add cost to the price of electricity delivery into the regional market.

While it is still too early to tell how these hurdles and costs will effect the competitiveness of Maine biomass power plants, some recent experiences suggest great difficulties may exist.

The problems and issues confronting merchant plants wishing to participate in the regional power market were explained by Bill Short in a presentation at the Ashland meeting. He offered the Committee several recommendations (see appendix G). Mr. Short pointed out that the regional market segment for renewables is not uniform because of significant differences in State definitions and eligibility requirements under various state RPS rules, thus Maine plants may not qualify to participate in out-of-state markets. In addition, he noted that the Maine standard includes efficient co-generation facilities allows out-of-state sources to compete for the 30% market share instate. He felt that Maine needs to take a much more active role in forums in other states to ensure that markets are available for Maine based renewable generators, and to argue the case for Maine generators in NEPOOL/ISO-NE and FERC deliberations and decisions. In particular, he stated that ongoing discussions and pending decisions regarding congestion pricing will put Maine export (renewable) power at a considerable competitive disadvantage.

The Committee discussed the effects of non-PTF access charges on Maine based generators. Access charges in the form of transportation tariffs to wheel wholesale power across a utility's wires to reach a customer in another service territory are set by the Federal Energy Regulatory Commission (FERC). The tariff rate is based on the utility's filings of costs to provide the transportation service. To accommodate the calculation of these charges, the network of transmission facilities in the NEPOOL area have been segregated into PTF lines (primary transmission facilities) and non-PTF network wires. All utilities have a local network system (LNS) costs (for CMP it is currently $19 million, but these cost vary yearly so a hard number is difficult to target), which are included in their rates. The system cost to handle the distribution of local generation of electricity that is sold to a customer on the local network is covered in these LNS rates.

The issue is what is a fair allocation of costs and charges to electricity generators using the local network to transport electrons for export outside the host utility system. To the extent that local utility rates can be structured to avoid extra charges for the use of local distribution facilities to reach the PTF system, it would create a benefit that might help Maine plants be more competitive in the regional market. As currently structured, local network systems cost are shared by all ratepayers, including any generators providing service to customers in the system. In the case where a local generator wishes to sell blocks of wholesale power to a customer in another utility service area, a wires charge is levied to wheel the power across the local system. How the costs to provide and maintain this transportation service on the local non-PTF should be allocated is the issue. Should all of the customers on the local system absorb those costs as part of the total network costs or should a tariff be charged to the generator to cover some share of local network costs? Utility representatives maintained that not being able to charge a transportation fee would not increase local network system costs, but it would force them to forego a significant source of income that could be used to lower system costs to other customers. So the choice is one of not charging generators for local access in order to lower transportation costs for Maine power being shipped into the regional marketplace, verses

applying a cost based charge to cover the cost of wheeling wholesale power over the system to another utility system.

Potential New Markets

Ethanol Production Potential

The idea of producing fuel ethanol from biomass feed stocks in Maine is not really new. During the energy crisises of the 1970's considerable time and moneys were invested in planning the development of ethanol production plants in Maine, using agricultural or wood wastes as the prime feed stocks. Today, what is new is improved production technologies and an increasing demand for ethanol for use as a fuel additive in gasoline or as a substitute to gasoline. In the last few years at least two potential producers have explored the potential to produce ethanol in Maine, based on available feed stocks and other locational considerations. Currently, the most active developer is BC International, "a company commercializing its proprietary and patented technologies to produce ethanol and other specialty chemicals from biomass".

In addressing the Committee on the potential for ethanol production in Maine, BCI representatives explained the chemical and mechanical process of converting cellulosic (biomass) feed stocks into bioenergy products like ethanol, they reviewed their proprietary technology, described their ongoing testing of the process and feed stocks, introduced the "biorefinery" concept, and provided information on several of their ongoing and planned projects around the country.

Coupled with a forecast of significant cost reductions in the production of ethanol from wood over the next decade, and the advantages of multiple product production in a biorefinery setting, BCI states that the technology is now ready for commercial use, and that it is "time to build" plants, potentially locating one or two plants in the northeastern US.

In listing the benefits of biomass ethanol production in Maine, BCI identifies the creation of new jobs and payrolls in rural communities as prime economic benefits, they list as environmental benefits providing a solution for waste management problems and certain air and water quality improvements, and energy security benefits from reduced reliance on fossil fuel imports and reduced susceptibility to price shocks.

In responding to the Committee's questions, BCI offered their view of the key components needed to make biomass ethanol production a reality in Maine. They stated that it will take:

> The development of demonstration projects to establish pilot plants and initial production facilities,

The assured availability of adequate quantities of suitable materials at a reasonable cost, and
A ten year market commitment of support for ethanol use to assist its transition to a fully competitive fuel alternative.

Supported by:

Research, such as a feasibility study for siting and developing a northeast biomass ethanol plant,
Advocacy to build a broad base of stakeholder support throughout Maine and the entire Northeast,
Supportive Governmental Policies, and
A Focus on a regional fuel market and infrastructure.

During the course of the Sawmill Biomass Committee's work, the State Planning Office helped organize a one day workshop funded by the US Department of Energy on the potential for biomass ethanol production and use in Maine. The purpose of this workshop was to provide information on ethanol market opportunities and the emerging production technologies using biomass feed stocks. In summarizing the results of the workshop, the State Planning Office characterized the current situation for ethanol production:

> Feed stocks are available, in sufficient volume to support an estimated 120 to 200 million gallons of production per year; there are proven production methodologies that can be used with Maine feed stocks, but still need to be tested for yields and other factors; potential markets exist but it is unclear as yet as to their size and competitiveness; and the environmental benefits on balance need to be more clearly established.
>
> There are clearly opportunities and benefits to be gained from the development of a biomass ethanol industry in Maine. The primary benefits include:
>
> New market for sawmill and silvicultural residues.
> New jobs and income in rural Maine communities.
> Additional economic stimulation supporting employment and income levels in local economies.
> Environmental benefits associated with lower emissions of SOX, and avoidance of problems like MTBE ground water contamination.
>
> A key element of a viable project opportunity will be the ability of a developer to plan and launch a project. For example, Farmers Fuel Inc. is a small farm scale operation and technology with a proven track record that could under the right circumstances be replicated in Aroostook Co. and other farming areas. On a much larger scale, the BCI folks have a reasonably sound business vision,

ownership of the right technology, an emerging pilot plant experience in LA, and big plans in CA; but still a fairly limited track record and experience in actual production and long term delivery of product.

Another key element will be the price/cost of feed stock materials. Ethanol product will be economically viable more quickly if feed stock costs are low to no cost. There are synergies in controlling feed stock costs when plants can be co-located with biomass power plants or other wood based manufacturing facility. Competition for mill residues will tend to keep a higher market price for these feedstocks.

And the third key element is the availability of solid markets to use the ethanol and other co-products. Given the volumes of ethanol that can be potentially produced and the current levels of gasoline consumption in Maine, ethanol will only satisfy a part of the market, probably in special applications such as fleets and aviation fuels. Significant distribution and marketing hurdles exist to getting ethanol in the fuel tanks of vehicles. The ethanol production process also yields a variety of other chemicals and materials that will have market value, that may actually be more profitable and thus support a project through price fluctuations and variations in demands.

So what is the potential for Maine sawmills to supply mill residues as feed stocks to bio-ethanol plants? BCI envisions possibly two biomass ethanol facilities in Maine, each about 20 million gallons of production in size, as being potentially developable based on available feed stocks and locational requirements. A plant in Northern Maine would require an annual feed stock supply of about 250,000 tons. Which could be made up of woody mill residues, the seasonal supply of agricultural wastes, and some whole tree chip material from logging operations. A full scale biomass ethanol production facility would create a substantial demand for feed stocks that could provide a significant new market for a large volume of mill residues currently headed to power plants and other markets. In fact, an ethanol plant would create a substantial market demand that could have the effect of raising the market value of mill residues, which would be good for the sawmills.

The Committee asked representatives of BC International Corporation to present a list of hurdles to the development of an ethanol plant in Maine. BCI responded by offering six suggested solutions:

1. Provide State fuel tax equalization for alternative fuels, where fuel taxes are based on the energy content on a per Btu basis. This would level or equalize the playing field for alternative fuels such as biomass ethanol.

2. Establish a goal for the use of ethanol fuels in the State's fleet vehicles, which would help create a market for Maine based plants.

3. Classify biomass ethanol plants as Manufacturing facilities, which would help streamline the siting process for environmental permits.

4. Establish a renewable fuel standard, on a regional basis, in order to stimulate market demand for biomass ethanol.

5. Consider biomass ethanol in new gasoline mixtures as a viable alternative to MTBE.

6. Investigate ethanol development programs in other States, notably Minnesota where strong and direct government policies have lead to the development of a robust ethanol industry.

In summary, the availability of ample feed stocks, and the opportunity to co-locate with an existing biomass power plant, with reasonably good rail and highway connections make Northern Maine a strong candidate to host a wood-to-ethanol plant. The Committee recognizes that biomass ethanol production is a longer term market based solution for the sawmill residue issue, given the current state of the technology and fuel market circumstances, and the lead times needed to construct a plant and get it into operation. But, the Committee through its recommendations can help encourage and even assist the process leading to the production and use biomass based ethanol fuel in Maine.

Processed Fuel Opportunity

Morrison Technologies, Inc., a Quebec based company whose principle owner is Morrison Technology in Unity, Maine has a patented process to manufacture a high quality fuel to be used in cement kilns. The patent is for the "managed composition of waste derived fuel" that can be made from various non-hazardous waste materials such as P&P mill treatment plant sludges and wood mill residues. The resulting fuel has a low to medium energy content, but a high ash content very suitable for use in cement kilns where the residual ash from combustion in a boiler can in turn be used in the cement product. An end-of-the-line disposal option for sludges and other materials mixed in the fuel.

Morrison sees a potential to utilize 300,000 to 500,000 tons of waste materials per year initially, and increasing to perhaps twice that volume as suitable materials become available. Although the potential wood volume content would be fairly small, 50,000 to 75,000 tons, a fuel processing plant could provide a limited market for excess mill residues.

Commercial development is still to be realized at some point in the future. Morrison has a potential manufacturing site in Fairfield, with good access to sludges and other waste materials in the region, but other than Rockland cement kiln markets are mostly in Quebec and New York

state. Again, Committee actions that would encourage delivery of lower cost wood residue would be of benefit to manufactured fuel facility.

Medium Density Fiberboard

During Committee discussions of existing and alternative markets, questions were raised about the potential for a medium density fiberboard (MDF) in Maine. The potential for locating an MDF plant in Maine frequently arises in the discussion of growth opportunities in Maine's wood products industry, because of the large volume of mill residues generated. A number of firms have studied and planned to develop a plant in Maine, only for it not to happen for some reasons. The committee discussed the potential for an MDF plant and the role it could play in providing a new market for mill residues. There are different grades of MDF which would have differing requirements for raw material, but in general, the existence of an MDF plant would be a valuable addition to existing markets.

Committee member Jim Lehner offered to inquire with some company contacts about the current circumstances influencing the development of a MDF plant in Maine. He reported that in keeping with committee discussion, the outlook is not good at the present time because of over capacity in North American plants. He reports that although markets are good, new capacity installed recently in Canada and Pennsylvania are keeping prices low, which will not entice consideration of a new plant. Nonetheless, in the long run Maine could still be a good location for an MDF plant.

Other Existing Markets and New Product Opportunities

Ongoing research and development of wood based products conducted by the US Forest Service, the University of Maine, and wood products manufacturers periodically yields a new product that could be manufactured in Maine, using native species and wood residues. One current example is the potential to produce a natural phenolic resin from certain biomass residues for use as a substitute in phenol/formaldehyde adhesive currently used to bond wood into products like oriented strand board. The production of a natural resin, would provide another option for the use of excess wood and bark residues.

In addition to the above described opportunities for new products, sawmill owners on the Committee report that they have studied the potential to make residential fuel pellets from their saw dust, and to provide materials for the landscaping mulch industry. Neither of these opportunities has been viable for a number of reasons. For one, the raw material specifications for alternative products could not be met with the types of materials currently going into hog fuel. In addition, transportation cost have been prohibitive to supplying distant markets. And thirdly, products like fuel pellet manufacturing and sales is not within their business focus.

Sawmill residues are highly variable in size and conditions and are not readily interchangeable as raw materials for other products. Usually the sawmill must separate and handle different waste types individually to meet the specifications of another use. Extra handling costs and relatively

small volumes will often make mill residues uneconomical to handle and sell. A wood fuel market can accept a range of materials all mixed together. Even in larger mills with a sizable volume of homogenous materials the potential to sell waste materials is often limited by the volumes that can be delivered, on a regular economical basis, to another user.

A sawmill operation can be adjusted to serve other existing product manufactures or new markets but it takes time to move into new arrangements. A sudden crisis brought on by the loss of a market can be a real problem for an operating plant, in the short term; but given some time, new markets can often be found and served.

Recommendations and Actions

From its first discussions, the Committee worked to differentiate the crisis as a sawmill problem verses a biomass power plant problem. As a sawmill problem the solutions would involve actions to alleviate a severe waste disposal problem for sawmill and wood processing operators, that would ultimately rest on Maine taxpayers to the extent any financial support was necessary. As a biomass industry problem the solutions would involve actions to help keep the biomass energy facilities in operation, which would necessarily place any financial responsibility on the electricity rate payers. The Committee has come to uniformly agree that their purpose is to find solutions that will work to solve the problems of the sawmill industry in handling quantities of mill residues that are currently sold to biomass energy facilities. To this end the Committee strongly recommends the creation of an income tax credit as a mechanism to help sawmills through a short term problem, while encouraging the development of expanded and new alternative markets as a longer term solution.

While the Committee is unanimous in its support for the sawmill industry, a majority of the Committee also feels that the income tax credit proposal recommended by the Committee would not be enough to ensure that biomass power markets would remain in place. Thus the Committee has discussed a number of additional proposals for actions that are needed to assist and contribute to the viable operation of the biomass power plants in the new, more competitive electricity marketplace. The Committee has considered a number of specific problems and issues confronting biomass power producers as they transition to become merchant power plants, free of PURPA-era contracts, as competitive sources of electricity. These actions are covered in the following Committee recommendations.

Income Tax Credit for Sawmills and Wood Products Manufacturers

The purpose of an income tax credit is to allow sawmill operators and other wood products manufacturers to deliver their wood fuel materials to biomass power facilities and certain other alternative markets for the cost of transportation. The credit would be set at a level a little less than the actual cost to deliver mill residues to the nearest market or user of those materials. A rate less than 100% is meant to discourage mills from taking any undue advantage of the credit. As an income tax credit the covered cost for transportation is subtracted from the taxpayers corporate income tax obligation, resulting in a direct "reimbursement" for delivery costs. For the Maine taxpayer this means that a certain amount of income tax revenue is foregone as a method to help mills recover their costs for handling excess mill residues. The result is that with most of the transportation cost covered, mill residues should be available at lower cost to the power plants and other alternative users, which should be a significant savings in fuel and raw material costs. This can be a win-win-wine situation, that is, sawmills will not have a costly disposal problem, although they may lose a current income stream; biomass power plants gain an edge in lower production costs; and the Maine economy benefits by retaining and expanding wood product based manufacturing jobs and businesses.

The proposed income tax credit will apply to so-call primary and secondary wood processors that comprise the population of Maine wood products manufacturers, but not to firms considered to be pulp and paper manufacturers or to companies producing biomass fuel materials from logging residues or other silvacultural activities. The credit is available for only those materials delivered to a (certified) biomass fueled power generation facility producing electricity as a product for sale, and will not apply to a mill or affiliate for self generation of electricity or energy for internal mill use. And certain specified alternative uses such as a biomass ethanol fuel production, processed manufactured fuel, phenol resin manufacturing, and pelletized fuels. The credit will be available as a refund to income taxes paid, and transferable as prescribed on a voluntary optional basis.

The Committee has included specifications to limit the credit to authorized uses. The credit amount is based on actual transportation cost on a sliding distance scale, set on a zonal or distance traveled basis to an authorized user, including electricity generation, heat and steam for sale; landscaping products; composting of sewer sludges; medium density fiberboard or other building products; ethanol or other forms of fuel derived from the residues; and phenol substitute in the manufacture of phenol-formaldehyde adhesive resins. The proposal includes a sunset provision which will allow the opportunity to review the efficacy of the credit, and to extend the credit as may be needed. The credit applies only to Maine manufacturers, thus keeping the benefits of the tax credit instate.

In addition to providing critical relief to sawmills and wood products manufacturers, the Committee sees this tax credit as an important public investment in encouraging the development of new biomass based products. The availability of lower cost raw materials delivered to an authorized user should provide some economic advantage for new uses. The existence of this credit will send a positive public policy message to ethanol producers that Maine is serious about encouraging the development of biomass ethanol industry. Likewise, the availability of lower cost raw materials will encourage process fuel and wood pellet manufactures to consider a Maine location for any new facilities. Thus as an economic development incentive, the Committee with this tax incentive seeks to provide not only a solution for the problems sawmills face in finding beneficial uses for residues, but to also see the development of new businesses and job creation.

Economic Development Opportunities

The Committee discussed its concern with the level of efforts extended by the Department of Economic and Community Development and other entities in the state in pursuing opportunities for wood products development, especially related to new product opportunities based on the availability of mill residues. The Committee agreed to send a letter to the Commissioner of DECD and the President of the Maine Science and Technology Foundation bringing to their attention the opportunities that exist for the use of mill residues, and urging each agency to investigate innovative uses of sawmill residues, examine the viability of particular product opportunities, and to fully consider the economic development potential of these uses in prioritizing work loads and pursuing opportunities. Further, the agencies would be asked to prepare a status report and make it available

Other Actions

The Committee discussed a number of problems and proposed actions related to the economic viability and success of biomass power plants located in Maine, that are attempting to participate in a regional market. Although the Committee emphasized a solution for the sawmill biomass problem, it did adopt a number of actions aimed at lowering hurdles faced by the stand-alone biomass plants trying to be competitive in the emerging New England marketplace.

Electricity Product Labeling:

The Committee, by majority vote, recommends two actions regarding the issue of how to properly account for the emissions of CO2 from biomass power plants on the electricity product disclosure labeling required in the Electric Industry Restructuring Act.

1. Sending a letter to the Maine Public Utilities Commission and the New England Conference of Public Utility Commissioners expressing the Committee's concern over the presentation of CO2 emission from biomass power plants on the uniform product disclosure label adopted by the MPUC. The letter would strongly recommend that NECPUC and MPUC reconsider the manner in which emissions of carbon dioxide are calculated and displayed in the uniform disclosure format to take account of the fact that carbon emissions form biomass power plants are recaptured by productive growing forests. Thus carbon dioxide emissions should be shown a zero when considered on a net effect basis.

2. Submit a Bill to the Legislature with the expressed purpose of directing the Maine Public Utilities Commission to show carbon dioxide emissions as net zero on electricity product labels as required by the Electric Industry Restructuring Act.

Resource Portfolio Standards:

The Committee, by majority vote, recommends submitting a Legislative amendment to the Electric Industry Restructuring Act that would revise the portfolio requirements for supply sources for retail sales in the state. The revisions to the law would provide that the 30% standard be filled only by the renewable sources listed as eligible, thus excluding energy efficient (co-generation) sources. An energy efficient source could be included if at least 75% of the energy for the efficient source is supplied from renewable sources. Further, this amendment would prohibit the electricity provider from counting any renewable content above the 30% standard in a customers product as part of the providers total portfolio requirement. These provisions would take effect on March 1, 2002.

Non-Primary Transmission Facility (non-PTF) Cost Issue:

The Committee accepted, with revisions, a draft *Joint Resolution Regarding Payments by Exempt Generators of "Point to Point" Charges* for submission to the Maine Legislature. This resolution will:

1. Request Maine utilities to eliminate non-PTF charges, thereby exempting generators from payment of these charges under local open access transmission tariffs,

2. Direct the Maine Public Utilities Commission (MPUC) to advocate for and fully account for the interests of Maine's renewable power industry, when it is consistent with the public interest, in regional forums such as meetings of the New England Power Pool, the Federal Energy Regulatory Commission, and the New England Conference of Public Utilities Commissioners.

3. Recommend and urge the Federal Energy Regulatory Commission (FERC) to respect and preserve any elimination of "point to point" charges that is proposed by Maine electric utilities and approved by the MPUC.

System Benefit Charge:

The Committee rejected any further consideration of using a system benefit charge to support the generation of electricity from renewables. The Committee felt that it is premature to recommend changes to the restructuring law before it has even taken effect. It was noted that the Legislature has asked the PUC to prepare a review of the status of restructuring, which will cover the effects of the RPS. The Commission is to make recommendations for changes it feels are necessary. The report is due by the end of December, but the Commission is not expecting to make many suggestions since there is little experience to learn from.

List of Appendices

APPENDIX A

H.P. 1583

JOINT STUDY ORDER TO ESTABLISH THE COMMITTEE ON SAWMILL BIOMASS

ORDERED, the Senate concurring, that the Committee on Sawmill Biomass is established as follows.

1. Establishment. The Committee on Sawmill Biomass, referred to in this order as the "committee," is established.

2. Membership. The committee consists of 17 members as follows:

A. Three members of the Senate, appointed by the President of the Senate, each of whom serves on the Joint Standing Committee on Business and Economic Development, the Joint Standing Committee on Agriculture, Conservation and Forestry, the Joint Standing Committee on Taxation or the Joint Standing Committee on Utilities and Energy;

B. Six members of the House of Representatives, appointed by the Speaker of the House, each of whom serves on the Joint Standing Committee on Business and Economic Development, the Joint Standing Committee on Agriculture, Conservation and Forestry, the Joint Standing Committee on Taxation or the Joint Standing Committee on Utilities and Energy;

C. Two representatives of the forest products industry who have expertise in sawmill operations and sawmill biomass markets, appointed by the Speaker of the House;

D. One representative of the biomass electric energy generation industry, appointed by the President of the Senate;

E. Three members of the public who have expertise in forest resource utilization, sawmill biomass management or forest products research and development, appointed by the Governor;

F. The Public Advocate or the Public Advocate's designee; and

G. The chair of the Public Utilities Commission or the chair's designee.

3. Appointments; chairs; quorum; convening of committee. All appointments must be made by July 1, 1999. The appointing authorities shall notify the Executive Director of the Legislative Council once all appointments have been made. The first named Senate member is the Senate chair and the first named House of Representatives member is the House chair. The first meeting must be called by the chairs no later than July 15, 1999 and the committee may meet up to 4 times before issuing its report. A quorum exists when at least 8 members are present at a meeting.

4. Compensation. Members of the committee who are Legislators are entitled to receive the legislative per diem as defined in the Maine Revised Statutes, Title 3, section 2 and reimbursement for travel and other necessary expenses for attendance at meetings of the

committee. Public members not otherwise compensated by their employers or other entities whom they represent are entitled to receive reimbursement of necessary expenses for their attendance at authorized meetings of the committee.

5. Duties. The committee shall investigate opportunities for maintaining markets for the sawmill biomass industry that will enhance the sawmill industry in the State, maintain employment and strengthen rural economies. The committee shall also study barriers to sawmill biomass markets and identify appropriate activities to promote existing or new products.

6. Staff assistance. The State Planning Office shall provide staff assistance to the committee, and the Department of Conservation, the Department of Economic and Community Development, the Department of Environmental Protection and the Bureau of Revenue Services shall provide expertise upon request from the committee. The Public Utilities Commission may contract with an expert or commission studies to assist the committee.

7. Report. The committee shall submit a report and any recommended legislation to the Speaker of the House of Representatives, the President of the Senate and the Governor no later than December 15, 1999. If the committee requires an extension of the reporting deadline, it may apply to the Legislative Council, which may grant the request.

Passed by the Senate June 5, 1999 and the House of Representatives June 5, 1999