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Final Report of the Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry

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Executive Summary

The 127th Maine Legislature established the Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry (referred to in this report as the "commission") with the passage of Resolve 2015, chapter 85. Pursuant to the resolve, 13 members were appointed to the commission: two members from the Maine Senate, three members from the Maine House of Representatives, a commercial wood harvester who supplies biomass, a representative of the biomass electric industry, a representative of a sawmill located in Maine, a scientist from the University of Maine who studies forest health and silviculture, a representative of a conservation organization, a representative of a pulp and paper manufacturer located in Maine, a representative of commercial timber holdings in Maine, and a representative of a business that uses biomass for thermal generation or cogeneration or an expert in the use of biomass energy for thermal generation or cogeneration.

The resolve set forth the following duties for the commission:

- Review and evaluate the economic, environmental and energy benefits of Maine's biomass resources, as well as public policy and economic proposals to create and maintain a sustainable future for the Maine biomass industry;
- Consider the interconnection of economic markets for biomass and forest products and the energy policy of the State;
- Consider whether the environmental, economic and energy benefits of biomass support updating the State's energy policy to strengthen and increase the role that biomass and the forest products industry play throughout the State;
- Consider the costs of implementing any recommendations and the effect of leaving current policies in place; and
- Examine any other issues to further the purposes of the study.

In addition, the commission was required to seek public input and to consult and collaborate with stakeholders and experts in the fields of economic development, natural resources and energy policy. The commission is required to submit a report, with findings and recommendations, including suggested legislation, to the Joint Standing Committee on Energy, Utilities and Technology and the Joint Standing Committee on Agriculture, Conservation and Forestry in December 2016.

Over the course of five meetings the commission received presentations from stakeholders, in-state and out-of-state utility regulators, state office representatives, subject matter experts, and visited a logging operation, sawmill, biomass facility and combined heat and power (CHP) facility.

With this information and through several discussions the commission developed five broad goals, and 15 recommendations to increase support for Maine's biomass industry (Appendix E). The commission developed the following broad goals:

- Encourage investment in biomass facilities and promote greater efficiency;

- Encourage investments in combined heat and power systems to promote efficiency;
- Enable and encourage co-location and other innovative projects utilizing behind-the-meter technologies to incentivize manufacturing growth and increase system reliability;
- Promote and develop Maine's forest-related resources in-state and abroad and take advantage of federal grant funding and other collaborative efforts to bolster the forest-based economy in Maine; and
- Create state policies that encourage biomass energy production and heating with biomass.

The commission developed the following recommendations to assist and encourage further investment in the biomass industry:

- Amend the renewable portfolio standards by creating a thermal class to incentivize increased efficient biomass use for thermal;
- Amend the renewable portfolio standards to explicitly extend new renewable capacity resource portfolio requirements beyond 2017;
- Create an addition under the renewable portfolio standards that provides incentives for facilities that create instate jobs and economic benefits;
- Offer incentives through Efficiency Maine Trust or other avenues to those converting to combined heat and power (CHP) systems;
- Incentivize schools and other public institutions to convert to CHP systems;
- Provide greater flexibility in the establishment of back-up and standby charges in order to alleviate the burden for large energy users who are seeking to use alternative systems to lower their energy costs and lessen their demand on the transmission system;
- Amend existing laws to explicitly allow microgrids statewide;
- Amend existing law regarding permitting of electrical lines, including poles and other related structures in, upon, along, over, across or under a road, street or other public way for persons other than transmission and distribution utilities;
- Amend existing law, or encourage the Public Utilities Commission through rulemaking, to increase the cap on installed capacity of a jointly owned generating facility under "shared ownership" net energy billing, as well as eliminate the cap of 10 accounts or meters for net energy billing;
- Review the federal Economic Development Assessment Team's final report on Maine's forest economy and a final report on biomass energy under the auspices of the Governor's Energy Office to avoid duplicative efforts and to take advantage of collaborative efforts to address Maine's issues with its forest-based economy;
- Encourage the Maine Forest Service to support efforts toward fostering growth and innovation across Maine's forest products industry, including full utilization of recently awarded grants from the U.S. Department of Agriculture (USDA) for a State Wood Energy Assistance Team and the "Strengthening and Expanding Maine Wood Markets" project;
- Establish a program similar to the "Get Real. Get Maine!" campaign to encourage the use of Maine wood energy among residents to heat their homes, businesses and public institutions and to promote local forest products locally, nationally and globally;
- Provide funding, through bonds and tax incentives, for research and development of new wood-based technologies and to get these new technologies from the incubator phase into the marketplace;

- Through statutory changes, categorize biomass-derived carbon dioxide emissions as carbon neutral and exempt from regulation under certain air pollution laws; and
- Encourage the Governor's Energy Office to make biomass a more focused, greater priority in Maine's Comprehensive Energy Plan.

In making its recommendations, the commission ensured that its recommendations addressed the biomass industry as a whole and did not just focus on energy production. The commission through its recommendations hopes to diversify the biomass industry, encourage more in-state investment and provide more stability to the industry.

I. INTRODUCTION

The Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry was established by Resolve 2015, chapter 85 (Appendix A). Pursuant to the resolve, 13 members were appointed to the commission: two members from the Maine Senate, three members from the Maine House of Representatives, a commercial wood harvester who supplies biomass, a representative of the biomass electric industry, a representative of a sawmill located in Maine, a scientist from the University of Maine who studies forest health and silviculture, a representative of a conservation organization, a representative of a pulp and paper manufacturer located in Maine, a representative of commercial timber holdings in Maine and a representative of a business that uses biomass for thermal generation or cogeneration or an expert in the use of biomass energy for thermal generation or cogeneration. A list of commission members can be found in Appendix B.

The duties of the commission are set forth in Resolve 2015, chapter 85 (Appendix A). The commission's duties are as follows:

- Review and evaluate the economic, environmental and energy benefits of Maine's biomass resources, as well as public policy and economic proposals to create and maintain a sustainable future for the Maine biomass industry;
- Consider the interconnection of economic markets for biomass and forest products and the energy policy of the State;
- Consider whether the environmental, economic and energy benefits of biomass support updating the State's energy policy to strengthen and increase the role that biomass and the forest products industry play throughout the State;
- Consider the costs of implementing any recommendations and the effect of leaving current policies in place; and
- Examine any other issues to further the purposes of the study.

In addition, the commission was required to seek public input and to consult and collaborate with stakeholders and experts in the fields of economic development, natural resources and energy policy. The commission is required to submit a report, with findings and recommendations, including suggested legislation, to the Joint Standing Committee on Energy, Utilities and Technology and the Joint Standing Committee on Agriculture, Conservation and Forestry in December 2016.

II. COMMISSION PROCESS

The commission held meetings on August 2, September 6, September 13, November 1 and December 5, 2016. All meetings were open to the public.

At the first meeting on August 2, the commission received presentations from the following:

- Tim Schneider, Office of the Public Advocate;
- Michael Stoddard, Efficiency Maine Trust;

- Dana Doran, Professional Logging Contractors of Maine;
- Bill Bell, Maine Pellet Fuels Association;
- Bill Carlson, Carlson Small Power Consultants;
- Mark Thibodeau and Nathan Hebel, ReEnergy;
- Patrick Strauch, Maine Forest Products Council;
- Donna Cassese, Maine Pulp and Paper Association;
- Tom Doak, Small Woodland Owners Association of Maine; and
- Charlie Niebling, Innovative Natural Resources.

Presenters were asked to provide recommendations to support and strengthen both the biomass and forest products industry throughout the State. The following emerged as common themes:

- Amend Maine's Renewable Portfolio Standards (RPS):
  - Update Maine's RPS by creating a thermal class, like the states of Massachusetts and New Hampshire, to incentivize increased biomass use for thermal; and
  - Extend RPS target beyond 2017;
- Create a biomass energy policy that fits within the State's comprehensive energy plan; Maine's biomass power industry could be an integral part of Maine's federal Clean Power Plan (CPP) compliance, particularly in subsequent rounds;
- Enable and encourage co-location:
  - Enable co-located systems that need to cross public rights-of-way; and
  - Encourage net metering/microgrids and distributed generation, which will lower transmission and distribution (T&D) costs and incentivize manufacturing growth;
- Encourage combined heat and power (CHP) system investments:
  - Create incentives for district heating; encourage development of small CHP applications connected to public and private institutions and wood manufacturers; and
  - Encourage thermal/CHP;
- Promote local wood, similar to the Maine Department of Agriculture, Conservation and Forestry "Get Real Get Maine" campaign; support a "Heat Local" campaign among Maine residents;
- Get State Wood Energy Assistance Team operating: $380K USDA funds (total) available for Wood Energy Assistance Team and a program titled "Strengthening and Expanding Maine Wood Markets;" obtain Maine Forest Service/Governor's Office sign-off on USDA Wood Innovation Grants (approved 5/13/16); and
- Look beyond combustion for biomass; explore alternative uses for biomass.

The commission also held a public comment period; the commission heard testimony from a resident of Waterville, a representative of the American Lung Association and a representative of the Natural Resources Council of Maine.

Presenters and members of the public also made comments outside of the common themes described above. Donna Cassese of the Maine Pulp and Paper Association reminded commission members that pulp and paper mills purchase and consume biomass fuel; therefore, the Maine biomass industry is greater than standalone biomass power plants and pellet mills.

Cassese added that any proposed solutions should be for the entire industry and not support one segment of the industry at the expense of another.

A public member testified in opposition to all combustion energy citing the threat that wood smoke poses to the environment - leading to air pollution and climate change. In his view, there is no such thing as safe smoke. Additionally, a representative of the American Lung Association suggested that industry leaders and Maine policymakers look to other markets besides combustion for wood waste.

The second meeting of the commission was an off-site field trip that took place on September 6, 2016. Commission members and members of the public visited the following:

- An active logging operation in Fairfield;
- Stratton Lumber, a sawmill that manufactures and markets softwood lumber;
- ReEnergy, a biomass facility adjacent to Stratton Lumber; and
- Athens Energy (an affiliate of Maine Woods Pellet Co.), which is a combined heat and power (cogeneration) facility.

At the third meeting on September 13, 2016, the commission received presentations from the following:

- David Mittelstadt, DTE Energy Services;
- Matt Bell, Northeast Pellets;
- Christopher "Kip" Nichols, Seven Islands Land Company;
- John Saintcross, New York State Energy Research and Development Authority;
- Commissioner Carlisle McLean, Maine Public Utilities Commission;
- Commission member Stephen Shaler, University of Maine; and
- Commission member Robert Linkletter, Maine Woods Pellet Company and Athens Energy.

Again, the commission held a public comment period; representatives of the Maine Pellet Fuels Association, Central Maine Power, and Sierra Club Maine provided testimony.

The commission's fourth meeting on November 1, 2016 included a review of suggested recommendations from previous presenters, interested parties and members of the public. Based on these suggestions and comments of stakeholders, the commission discussed and developed preliminary findings and recommendations for the commission's final report.

The commission discussed and finalized its draft report at its fifth and final meeting on December 5, 2016. Members of the public were given the opportunity to respond to the goals and recommendations of the commission (written public comments are included in Appendix D).

III. GOALS AND RECOMMENDATIONS

Goal 1: Encourage investment in biomass facilities and promote greater efficiency.

Maine currently has six standalone biomass power facilities with a combined total capacity of over 200 megawatts (MW). According to the Biomass Power Association, these six facilities, when operating, spend $115 million annually and support 148 direct jobs and an estimated 900 indirect jobs. Furthermore, the Professional Logging Contractors of Maine states that more than any other energy source, nearly 100% of the benefits from biomass energy are kept in state. In addition, the Sappi mill in Westbrook has 50 MW of capacity and the Sappi mill in Skowhegan has 100 MW of capacity. Couple that with other paper mills and smaller facilities and biomass energy generation can provide instate generated energy that can provide benefits to the forest products industry as a whole, as well as other businesses. However, with the shutdown of the two Covanta facilities in West Enfield and Jonesboro, six paper mill closures in recent years, warm winter temperatures in 2016, changes in renewable portfolio standards (RPS) policy in other New England states, record low wholesale electricity prices, and low oil and natural gas prices, Maine's biomass energy generation industry has experienced many obstacles, which also has a staggering negative impact on all of Maine's forest-based economy.

In the past, there have been periods of low wholesale electricity, oil and natural gases prices; however, biomass facilities were helped somewhat during these times by the renewable energy credit (REC) markets in other states. Biomass facilities would receive above-market payments for their electricity in states such as Massachusetts and Connecticut. When Massachusetts changed its RPS policy, these Maine facilities no longer qualified for Class I RECs in that state. Massachusetts now requires a facility to achieve 50% or higher overall efficiency in a quarter to qualify for one-half Class I REC and 60% or higher overall efficiency in a quarter to qualify for one Class I REC.[1] These new standards are very difficult to achieve for a standalone biomass facility. This loss of revenue and the possibility of changes in policy in other states have created a great deal of uncertainty for biomass facilities, and Maine's current renewable portfolio standards do not provide any buffer.

Recognizing the importance of facilities that utilize biomass to produce energy to Maine's forest-based economy, the commission sees value in amending the current RPS.

Recommendations

1.1. Amend the renewable portfolio standards by creating a thermal class to incentivize increased efficient biomass use for thermal.

The commission recommends adding a thermal class to the RPS. The addition of a thermal class will promote more efficient facilities as these systems will capture lost energy and potentially attract other businesses to take advantage of these systems. In addition, encouraging the installation of these systems will assist in displacing the use of imported oil, thus keeping those expenditures in state. While the commission did not decide on a specific recommendation regarding a thermal REC, it did discuss looking to New Hampshire and Massachusetts for

[1] 225 CMR 14.05 (8)(c)(3)(a)-(b)

guidance on developing a thermal REC policy in Maine. The commission feels it not necessary to limit thermal RECs to biomass only but rather believes that the creation of a thermal REC policy should be technology neutral. The commission finds there are benefits from including thermal RECs in Maine's RPS, not only for any qualifying biomass facilities but also more broadly for combined heat and power (CHP) systems.

The commission also sees value in encouraging the production of thermal biomass through other incentives. In a proposal that was before the Minnesota Legislature in 2015, a Biochemical Producer Payment Program was introduced, which included a biomass thermal production incentive program. This program proposed to incentivize producers through direct payments that would be at a set, standard rate for all qualifying producers and caps how much an eligible facility could receive. The commission believes more creative incentives like the Minnesota program would help encourage thermal biomass production in the state, as it is a more aggressive, directed approach that goes beyond a market mechanism.

In comments submitted by the Maine Pellet Fuels Association (MPFA) (Appendix C) after the November 1, 2017 commission meeting, the MPFA offered eight principles to guide the creation of a Maine thermal REC. Those principles are as follows:

1. A thermal REC should be fuel and technology neutral;
2. REC prices must serve as an effective incentive;
3. A thermal class should be independent of electric renewable technologies;
4. Thermal REC requirements should be meaningful and phased in gradually over a period of 10 or more years;
5. A thermal REC should not discriminate for or against projects based on their size or anticipated thermal REC output;
6. Do not be too detailed in statute, but rather leave the details to administrative rulemaking;
7. Do not create unreasonable and unenforceable technical requirements that saddle thermal renewable technologies; and
8. Thermal RECs should only be available to new projects by setting a "begin service date."

In addition to the comments submitted by the MPFA, ReEnergy also submitted comments after the November 1, 2017 meeting regarding thermal RECs (Appendix C). Like the MPFA, ReEnergy also felt that a thermal REC should be its own separate requirement, it should be available to systems besides biomass, and that it should be for new systems (specifically, ReEnergy suggested an installed and operational date of after January, 2016). ReEnergy also provided a specific required MMBtu (one million British thermal units)-MWh (megawatt hour) conversion rate of 3.412. ReEnergy submitted the following compliance schedule for thermal RECs (this schedule assumes 2018 as the starting compliance year).

2018: 0.2%	2019: 0.5%	2020: 1%	2021: 1.5%	2022: 2%
2023: 2%	2024: 2%	2025: 2%	2026: 2%	2027+: 2%

ReEnergy suggests including compliance requirements that are in line with other New England states, and following New Hampshire and Massachusetts by allowing thermal energy projects to monetize their renewable energy attributes.

The commission, while supporting of the creation of a thermal REC, does not necessarily support all aspects included in the public comments from MPFA and ReEnergy.

1.2. Amend the renewable portfolio standards to explicitly extend new renewable capacity resource portfolio requirements beyond 2017.

Currently, a competitive energy provider must demonstrate that at least 9% of its portfolio of supply sources for retail electricity sales in Maine is accounted for by new renewable capacity resources, and from January 1, 2017 to December 31, 2017, this requirement increases to 10%. The Public Utilities Commission's (PUC), Chapter 311 rule, continues the 10% requirement after 2017. The commission recommends specifically stating in statute (Title 35-A, section 3210, subsection 3-A) that the requirement for a competitive energy provider's portfolio supply increase for new renewable capacity resources after 2017. While the commission did not decide on a specific percentage requirements, there was agreement that the requirement increase in 2018. Some members suggested a 1% per year increase for 10 years, while others questioned whether it would be better to require a 1% per year increase for a shorter period of time with a report at the end of that time period evaluating whether there was value in further increasing the percentage, keeping the percentage at a set level or simply removing any percentage requirement.

Subsequent to the November 1, 2017 commission meeting, ReEnergy submitted written comment that included the following increase schedule (see Appendix C):

2018: 11%	2019: 12%	2020: 13%	2021: 14%	2022: 15%
2023: 16%	2024: 17%	2025: 18%	2026: 19%	2027: 20%

As stated in the ReEnergy's written submission, this would be in line with actions taken by other states.

This statutorily required percentage increase would provide an incentive for Maine facilities to continue to operate and could possibly spur further investment in other new renewable capacity resources facilities.

One commission member suggested that the new renewable capacity resource definition be amended to be applicable only to baseload renewables. The rest of the commission did not support this recommendation. The member believes this change is necessary in order to encourage the continued production of biomass energy without being threatened by other non-dispatchable renewable energy sources.

1.3. Create an addition under the renewable portfolio standards that provides incentives for facilities that create instate jobs and economic benefits.

Recognizing the benefits provided by in-state baseload biomass facilities and the jobs and investments they provide to Maine, the commission discussed including a provision in the RPS that offers an incentive for facilities that provide in-state economic benefits. The commission did not decide on a specific mechanism or discuss specific requirements, but contemplated either

a separate in-state economic benefit REC or the creation of an in-state economic benefit carve-out within the existing Class I RPS statute.

Commission members believe including in-state economic benefits in the RPS would help negate some of the ratepayer impacts from paying above market rates for electricity.

After the November 1, 2017 meeting, ReEnergy submitted written comments that suggested creating an economic benefit REC as a subset of the existing Class I RECs (Appendix C). However, this REC would only be applicable to biomass energy facilities. ReEnergy suggested making this requirement effective in either 2018 or 2019. Under Maine's existing RPS, a Maine Economic Benefit REC (MEBREC) would be created with the requirement that a competitive energy provider's portfolio contain at least 5% MEBRECs. As this would be a subset of the existing Class I compliance requirements, the total volume compliance requirement for a competitive energy provider would not increase. For example, in 2017, a CEP is required to demonstrate that new renewable capacity resources account for 10% of its portfolio of supply sources for retail electricity sales in Maine. If the MEBREC requirement were in effect in 2017, 5% of that 10% would need to be from MEBRECs. As suggested, an MEBREC-eligible generator would need to be a Class I eligible biomass generator that demonstrates that it creates direct economic benefits to the state per megawatt hour that is in excess of the determined MEBREC alternative compliance payment. ReEnergy suggested that the generator would need to provide to the PUC (first in a petition, then on a yearly basis) data to substantiate that it qualifies as a MEBREC eligible generator and that the benefits must be directly associated with the production of renewable energy. Furthermore, no one REC, whether a Class I REC or an MEBREC can be used to both satisfy Class I requirements and MEBREC requirements. While the commission supports providing incentives for facilities that create in-state jobs and economic benefits, they did not specifically discuss the suggestions provided by ReEnergy.

The PUC expressed concerns about including in-state economic benefits into the RPS in its response to questions submitted by the commission. The PUC contends that quantifying economic benefits in the context of the RPS could be analytically challenging. According to the PUC, traditionally the goal of the RPS has been to encourage the development and operation of specific types of generating facilities rather than economic development, and this is not their area of expertise. If an in-state economic benefit was included in the RPS, perhaps that analysis would be better suited to a different agency, such as the Department of Economic and Community Development. This is an important consideration because the PUC recently sought the services of an outside contractor to conduct the necessary economic analysis as the result of the enactment of Public Law 2015, chapter 483, which requires that contracts awarded for biomass resources provide in-state economic benefits. This has been an expensive and complex exercise for a one-time contract. If economic benefits were to become part of the RPS, certifying that a facility met necessary requirements would require yearly analysis to ensure compliance and for the PUC to hire an outside contractor to do this analysis on a regular basis would be costly. However, in spite of this possible hurdle, the commission recommends the inclusion of economic benefits into Maine's RPS to support generating facilities that provide jobs and other economic benefits that stay in the state.

Goal 2: Encourage investments in combined heat and power systems to promote efficiency.

In the report, "Combined Heat and Power: Effective Energy Solution for a Sustainable Future," prepared by the U.S. Department of Energy it states that combined heat and power (CHP) systems are "proven and effective near-term energy options to help the United States enhance energy efficiency, ensure environmental quality, promote economic growth, and foster a robust energy infrastructure."[2] CHP systems aid in the reduction of greenhouse gas emissions and help lower demand on transmission and distribution systems.[3] CHP systems are efficient because they utilize the normally wasted heat from the generation of electricity for heating or cooling needs or process applications.

CHP systems can help businesses by lowering costs in the long-term, which can make them more competitive. The commission feels strongly that the benefits provided by CHP systems are worth promoting. The commission also feels that there should be rewards for existing CHP systems since CHP systems not only help reduce the need for costly transmission projects, but they provide a more environmentally friendly form of energy production.

Recommendations

2.1. See recommendation 1.1- Thermal RECs.

2.2. Offer incentives through Efficiency Maine Trust or other avenues to those converting to CHP systems.

Currently, the Efficiency Maine Trust (EMT) under its Commercial and Industrial Custom Program (C&I Custom Program) provides:

- Scoping audits at no cost which identify a facility's specific energy use and projects that will reduce cost and promote energy;
- 50% of the cost up to $20,000 for technical assistance studies that are to be completed by a professional that has experience with the proposed technology in order to move an identified project forward; and
- Funding levels from $10,000 to $1 million, or up to 50% of the total project costs, in order for a customer to achieve electrical and thermal energy savings.

In order for a project to qualify for funding, it must "offset existing grid-supplied electricity, not export additional electricity to the grid or other customers, have an operating efficiency of 60% or greater, and supply 15 minute metering data to EMT."[4] Projects must be cost effective meaning they must have a benefit-to-cost ration of 1.0 or higher.[5] Maine hospitals, wastewater treatment facilities, jails and other facilities have utilized assistance from EMT to complete CHP projects.

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[2] https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_report_12-08.pdf
[3] Ibid.
[4] http://www.efficiencymaine.com/docs/3_Efficiency_Maine_Custom_Program_Ian-Bumes.pdf
[5] Ibid.

The variety of applications and facilities that can utilize CHP goes beyond biomass, but the commission sees the value of incentives offered by EMT for biomass. While EMT currently has a program in place, the commission suggests a more concerted effort in promoting CHP systems that utilize biomass or assisting existing standalone biomass facilities in converting to a CHP system. The commission also recognizes that for some projects, the 60% operating efficiency requirement may be an obstacle to some biomass-based projects. The commission recommends that the EMT evaluate whether the 60% operating efficiency requirement is an impediment to projects utilizing biomass, and if so, determine how to address this barrier in order to promote biomass-based CHP systems.

Other possible incentives discussed briefly at the November 1, 2017 meeting of the commission were tax incentives, grants or rebates for CHP projects. The commission discussed the benefits of providing grants to sawmills to install CHP systems as a way to utilize their waste in a way that would benefit their business. While the commission does not have a specific recommendation regarding any tax incentive, grant or rebate, other than proving grants to sawmills to install CHP systems, the commission believes this is an area worth exploring further.

2.3. Incentivize schools and other public institutions to convert to CHP systems.

Under the federal American Recovery and Reinvestment Act (ARRA) of 2009, the Maine Forest Service received a grant to fund the installation of wood-energy boilers for Maine public entities, which included schools, hospitals and local government buildings. This targeted funding allowed entities to install wood-energy boilers. The grant money was stimulus funds for the creation of jobs, as well as the increased use of renewable energy. The commission considers targeted funding that focuses on public buildings as a key way to promote CHP systems in these public institutions. While schools, universities, hospitals and other public institutions may be eligible for assistance under EMT's C&I Custom Program, it does not specifically target public institutions. The commission believes establishing a program, either under EMT, or elsewhere, that is solely for eligible public institutions is a possible avenue to achieve conversion to CHP systems. If established under EMT, the program can be modeled after the existing C&I Custom Program but with outreach resources focused on public entities, as was the case with the ARRA funding.

While not discussed in detail at meetings of the commission, the idea was raised to require new construction or the major renovation of a public building to be evaluated to see if the installation of a CHP system or wood-energy boiler would be a cost-effective option. If determined to be cost-effective, then the installation of one of those options would be required.

The commission considers this an important recommendation because it could provide long-term cost savings to communities, environmental benefits, and other potential economic benefits.

2.4. Provide greater flexibility in the establishment of back-up or standby charges and demand charges in order to alleviate the burden for large energy users who are seeking to use alternative systems to lower their energy costs and lessen their demand on the transmission system.

Transmission and distribution utility customers that have on-site electric generation facilities or are connected to an adjacent generator often remain connected to the transmission and distribution system in order to have power when there are planned or unscheduled outages of the generator. Having this connection is a service that is referred to as standby or back-up service. The rates at which these generators are charged by the utility are approved by the PUC and are based on the costs incurred by the utility for infrastructure that must be constructed and maintained in order to deliver that power to the customer when needed.

Demand charges, also regulated by the PUC, are calculated based on peak usage for the month. A demand charge is to ensure that the system is capable of delivering electricity during peak consumption periods.

During the process, the commission heard from stakeholders about the burden these charges impose. The commission recommends that more flexibility be built into the ratemaking process so that individuals have more options when dealing with these charges. The commission would like customers to have the ability to negotiate these charges, or find creative solutions in order to alleviate some of the burden these charges impose, especially for those customers that are looking to creative onsite electric generation projects or for those engaged in forest-related activities. The commission understands that this is a very complex issue and would like the PUC, the transmission and distribution utilities and stakeholders to come together to explore solutions that will provide relief to customers, while still ensuring a reliable system capable of delivering power when needed.

Goals 3: Enable and encourage co-location and other innovative projects utilizing behind-the-meter technologies to incentivize manufacturing growth and increase system reliability.

At the September 6, 2017 meeting, the commission met offsite and toured the ReEnergy biomass electric generating facility and Stratton Lumber in Stratton, Maine, and learned about the unique relationship between these two facilities, whereby Stratton Lumber provides ReEnergy with biomass materials, and in return, ReEnergy provides Stratton Lumber directly with electricity at a negotiated rate. The commission learned how co-location lowers business costs and provides some stability to businesses. Co-location on a scale larger than the Stratton example is something the commission encourages. The commission believes this business model could be a positive direction for existing biomass facilities as they could provide electric and thermal at lower costs and market themselves in that manner.

As a result of that visit and commission discussions, as well as a presentation from John Saintcross of the New York State Energy, Research and Development Authority on New York's Prize Community Grid Competition, the commission considers Maine to be lagging in its encouragement of moving behind the meter. Not only could behind-the-meter technologies assist the biomass industry, but they could also reduce the burden on the transmission system,

and provide greater grid resiliency. The commission recognizes that there are regulatory impediments to the these concepts, but highly recommends that these hurdles are addressed to more easily allow co-location, microgrids and other behind-the-meter technologies to encourage investment and spur innovation in Maine's biomass industry.

Recommendations

3.1. Amend existing laws to explicitly allow microgrids statewide.

Currently, microgrid projects (as well as co-location projects) face some issues. If a generating facility was directly supplying electricity to single or multiple customers, that generator might be functioning as a transmission and distribution utility. Currently, transmission and distribution utilities are regulated monopolies, and as such have an obligation to serve customers in defined service territories, at regulated rates; in exchange, competition is limited in the territory. Title 35-A, section 2102 requires PUC approval before a second utility could provide service in which another utility is already providing service.

In addition, if that generator is functioning as a transmission and distribution utility and also generating electricity and selling it to customers, this may conflict with the restructuring law, which seeks to keep generation and generation-related assets separate from transmission and distribution. Another consideration and possible impediment is whether generators would be considered competitive energy providers, and if so, would they need to be licensed.

The commission recognizes this is a very complex issue that touches upon many provisions in Title 35-A, but the commission strongly believes it is necessary to permit these projects in a more definitive manner. As described in more detail in recommendation 3.2, leaving case-by-case determinations in place only creates uncertainty and leads to long, drawn-out legal battles. The commission discussed allowing microgrids on a limited basis, or a defined number of projects as a pilot project, or requiring there be some connection between the generator and customer, but did not have a specific recommendation defining to what extent co-location/microgrid projects should be allowed.

In its written comment, ReEnergy suggests the creation of a pilot "biomass energy park" program in Aroostook County. The pilot program would allow a biomass generator to provide behind-the-meter electricity to commercial customers that are also involved in the forest products industry. ReEnergy compared this proposal to the Pine Tree Development Zone program, in that the goal is to encourage economic development in Aroostook County by promoting a program that lowers energy costs for participating businesses. This would not only provide an incentive for existing businesses to stay in Aroostook County, but it may also incentivize other businesses to relocate.

ReEnergy asserts that if the requirement for a forest products nexus is included with also capping the amount of megawatts allowed to be sold to participating customers and limiting the duration of the program, a pilot of this nature could allow the realization of these types of programs without directly threatening a transmission and distribution utilities' exclusive franchise rights.

ReEnergy also suggests looking to Connecticut in order to require transmission and distribution utilities to pursue pilot projects involving the integration of distributed energy resources into the wider grid. Title 35-A, section 3132-A, currently requires that for every transmission project proposed, an independent third-party must investigate nontransmission alternatives to the proposed transmission project. In the PUC's assessment of whether to approve a transmission project, the PUC is required to "consider whether the identified need over the effective life of the proposed transmission project can be economically and reliably met using nontransmission alternatives at a lower total cost."[6] The PUC is required to give preference to nontransmission alternatives that can address the need for the proposed transmission project at a lower cost to ratepayers. This provision can be expanded to further encourage the involvement of the utility in exploring more integration of distributed energy resources in order to promote a smarter grid.

The ReEnergy comment included the suggestion that the PUC provide a program to fund feasibility studies for community microgrids, as done in other states such as New Jersey and New York. The commission was presented with information about New York's Prize Community Grid Competition and found this to be something worth exploring in some manner in Maine.

While the commission discussed and supported the promotion of microgrids, it did not explicitly endorse the specific recommendations provided in the comment submitted by ReEnergy.

3.2. Amend existing law regarding permitting of electrical lines, including poles and other related structures in, upon, along, over, across or under a road, street or other public way for persons other than transmission and distribution utilities.

The commission heard numerous times from stakeholders that the law needed to change in order to allow electrical lines to cross the right-of-way. Stakeholders felt that if the ReEnergy facility had been located across the right-of-way from Stratton Lumber that the arrangement they are currently engaged in would have not been permitted. However, in its response to the commission's inquiry, the PUC stated that there is nothing in Title 35-A or PUC rules that poses a significant barrier to crossing the right-of-way. In looking further into this issue, the commission came to a couple of conclusions. The first is this idea that crossing the right-of-way somehow prohibits an arrangement like the ReEnergy-Stratton Lumber relationship likely came from the decision that found this relationship did not violate Title 35-A. In the Boralex case[7] (ReEnergy purchased Boralex), the PUC looked at five factors to determine if the proposed relationship would be considered public or private in nature. If it were determined to be public, then Boralex would be acting as a transmission and distribution utility without the proper authority.[8] The five factors that were considered by the PUC were as follows:

1. "The generator and customer are located on the same or physically adjacent property;
2. The generator and customer have a commercial or corporate relationship that goes beyond the sale of electricity;
3. The number of customers served or could be served is limited;

[6] Title 35-A, section 3132-A, subsection 2.
[7] *Commission Investigation Regarding the Plans of Boralex Stratton Energy, Inc. to Provide Electric Service Directly from Stratton Lumber Company.* Docket No. 2000-653 (April 6, 2001) (Commissioner Diamond, dissenting).
[8] Ibid.

4. All the power sold comes from the generator as opposed to the utility grid; and
5. There are no sham transactions to create a private character regarding the sale."[9]

Not all five factors have to be met in order for the relationship to be permitted and determinations of this nature are fact-specific inquiries. The commission theorized that the first factor, "the generator and customer are located on the same or physically adjacent property" may be the source of the notion that once the right-of-way is crossed that relationships of this nature are automatically prohibited. It is the commission's understanding that is not necessarily the case and that the PUC would make a fact-based inquiry and look at all the information to assess whether a proposed relationship would rise to the level of being deemed a public transaction. This does illustrate that there is no definitive policy allowing these relationships, and determinations would be made on a case-by-case basis; therefore, uncertainty exists that may impede investments or make existing facilities hesitant to request an inquiry into whether a proposed transaction, like the ReEnergy-Stratton Lumber transaction, would be allowed under their particular facts and circumstances.

Another area that has implications for the crossing of a right-of-way can be found in Title 35-A, section 2305-B, subsection 2. This particular section is related to the regulation of facilities in the right-of-way (see language below).

> **2. Persons other than transmission and distribution utilities.** A person other than a transmission and distribution utility may not construct or maintain electric lines, including poles or other related structures, in, upon, along, over, across or under a road, street or other public way unless:
>
> A. The person satisfies the requirements of section 2503;
>
> B. The person or the person's contractor hired to construct the line provides to the applicable licensing authority a performance bond:
>
> (1) In the amount of the value of the line, including poles or other related structures, to be located in the public way; and
>
> (2) That is enforceable for one year from the date the line is energized;
>
> C. Prior to constructing the line, the person notifies the transmission and distribution utility in whose service territory the line is proposed to be built of the proposed location of the line; and
>
> D. If a public utility objects to the line on the basis that it may constitute a duplication of existing transmission or distribution facilities or may interfere with the adequate and safe delivery of electricity to others, the commission issues a finding that the line is not a duplication of existing transmission or distribution facilities and does not interfere with the adequate and safe delivery of electricity to others.

[9] Ibid, p. 29.

A finding is not required under this paragraph unless a public utility has objected in writing to the applicable licensing authority.

The reference to compliance to Title 35-A MRSA, section 2503 is the procedure for obtaining a location permit from the applicable licensing authority (the municipality, the Maine Department of Transportation or county commissioners). This statutory provision leads to uncertainty for relationships, such as the ReEnergy-Stratton Lumber relationship, because if the line crosses a road the utility can object to the line, thus initiating a proceeding at the PUC to settle the matter. The commission feels that along with recommendation 3.2 above, some exceptions need to be made to provide more certainty that a proposed project will not be stalled by lengthy proceedings. The commission is not suggesting that biomass facilities interested in co-location projects be exempt from the permitting requirements, but the law be amended to provide more clarity about when crossing may occur without the threat of objection from the utility.

3.3. Amend existing law, or encourage the Public Utilities Commission through rulemaking to increase the cap on installed capacity of a jointly owned generating facility under "shared ownership" net energy billing, as well as eliminate the cap of 10 accounts or meters for net energy billing.

Currently, Maine statute does not include many specifics on net energy billing, it simply allows the PUC to adopt and amend rules governing net energy billing (Title 35-A MRSA, section 3209-A). Those rules (65-407 C.M.R. ch. 313) are subject to an ongoing rulemaking. The PUC has proposed increasing the cap on installed capacity of an eligible facility from 660 kilowatts to one megawatt. The proposal also aims to amend the rule by eliminating the cap of 10 accounts or meters for net energy billing. However, the proposed rule would require that shared ownership and community net energy billing customers be entitled to an interest of at least one kilowatt of the eligible facility capacity.

The commission supports the proposed changes discussed above, as they are directly in line with its recommendation. The commission thinks this is an important rulemaking as it allows smaller generating facilities utilizing biomass to engage in net energy billing and provides those facilities with more options in creating arrangements that would make it worthwhile to construct, develop and invest in facilities. However, the commission did discuss not capping installed capacity of an eligible facility so that net energy billing arrangements could be available to larger facilities. There was not an extensive discussion on this specific idea, but the commission recommends exploring this option further.

Goal 4: Promote and develop Maine's forest-related resources in-state and abroad and take advantage of federal grant funding and other collaborative efforts to bolster the forest-based economy.

Maine is the most heavily forested state in the nation with approximately 17 million acres of forestland. As a result, Maine's forest resource has long been a significant contributor to the state's economy, not only through traditional forest commodities, but also through Maine's tourism and recreation-based industries. With the closure of six paper mills in recent years and

the departure of two biomass energy plants in the spring of 2016, Maine's forest products industry is facing significant challenges.

As noted in the Maine Forest Products Council's (MFPC) June 2016 report called "Maine's Forest Economy," the state's forest products industry has reached a turning point. The marketplace is changing and Maine's forest economy must respond by diversifying, expanding and reinventing itself.[10] Markets for traditional forest products like pulp and paper and lumber have been significantly altered, while a new wave of wood-based technologies hold promise for the future sustainability of Maine's forest-based economy.

One of the issues that the forest products economy is facing is that local markets for biomass fuel in particular have declined considerably. Paper mill closures, lower world oil prices, lower regional electricity prices and changes in regional renewable energy markets have contributed to this decline. According to the MFPC, demand for low-grade softwood used by mills and biomass plants has fallen approximately 50% in recent years.[11] Landowners have counted on this market for their low-grade wood.

According to a recent forest market industry blog, "While the loss of softwood markets has affected the entire regional supply chain, it has also created opportunities for new market entrants. A number of existing paper mills are experimenting to see if they can increase their use of (now abundant) softwood while maintaining yield and quality. Entrepreneurs and developers are also looking at this resource for use in wood pellet and biofuels manufacturing, chip exports and a number of other wood raw materials markets as they are seeking to find new economic uses for low-grade softwood."[12]

In Maine, there have been exciting new developments in the realm of markets for low-grade wood and softwood. The University of Maine's Forest Biproducts Research Institute (FBRI) is an example of a program working with a broad array of partners to foster innovation and commercialization for the future of the state's forest-based economy. FBRI is working on the development of wood-based bio-refineries where many products, such as pulp, paper and fuels, are created at one location.[13]

Earlier this year, the federal government awarded $7.7 million in various federal grants to bolster Maine's struggling forest-based economy.[14] In fact, FBRI is one of the recipients of one of these grants. The U.S. Department of Defense will invest $3.3 million to advance wood to jet fuel technology at the Technology Research Center of the FBRI at the University of Maine.[15] Portions of the overall grant award are described in more detail below, namely funds invested with the Maine Development Foundation (MDF) to support the work of the U.S. Department of Commerce Economic Development Assessment Team and funds for the development of a road map to advance biobased manufacturing in Maine.

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[10] Maine Forest Products Council. *Maine's Forest Economy*. June 2016.
[11] http://www.pressherald.com/2016/12/01/state-looking-for-rainmaker-to-revive-forest-markets/
[12] http://blog.forest2market.com/softwood-pulpwood-demand-declines-in-the-northeast
[13] http://forestbioproducts.umaine.edu/about-fbri/frequently-asked-questions-faq/
[14] http://www.mainebiz.biz/article/20160801/NEWS01/160809993/feds-deliver-$77-million-to-diversify-maine's-economy
[15] Ibid.

Recommendations

4.1. Review the federal Economic Development Assessment Team's final report on Maine's forest economy and a final report on biomass energy under the auspices of the Governor's Energy Office to avoid duplicative efforts and to take advantage of collaborative efforts to address Maine's issues with its forest-based economy.

In response to recent major mill closures and corresponding job losses, members of Maine's Congressional delegation asked the United States Department of Commerce (DOC) to form an Economic Development Assessment Team (EDAT) to help Maine's forest products industry and affected local communities. The federal Economic Development Administration (EDA), a bureau within DOC, has previously deployed EDATs in communities that have experienced major natural disasters, such as wildfires and flooding, and economic development emergencies, such as the New England fisheries crisis.

In late June 2016, DOC announced that a multi-agency EDAT would be deployed in Maine to evaluate existing economic strategies and to develop new strategies for addressing the state's forest-based economic challenges. In addition to EDA, federal agencies from the Departments of Agriculture, Labor, Energy and Transportation; the Environmental Protection Agency; the Small Business Administration; and the Northern Border Regional Commission visited sites in Maine and participated in stakeholder meetings over the course of three days in August 2016. In her announcement letter, Commerce Secretary Penny Pritzker noted that the "process will also examine how local, state and federal partners can work together on new and existing research to foster innovation and commercialization in the forest economy."

Maine's Congressional delegation asked the MDF, a private, non-partisan membership organization, to help facilitate the work of the EDAT and to ensure active engagement from local communities. With the help of an EDA grant, MDF will support, coordinate and track the economic recovery efforts resulting from the EDAT's findings and recommendations. According to MDF, the final report of the federal EDAT will be released in December 2016 or early January 2017.

In addition, MDF, in consultation with the Maine Forest Products Council (MFPC), formed a Maine Forest Economy EDAT Planning Committee to coordinate planning, ensure inclusion of a range of perspectives and help determine the best way to leverage the federal EDAT report.[16] The chairs of the planning committee are Patrick Strauch, executive director of MFPC, and Yellow Light Breen, president and chief executive officer of MDF. The planning committee includes, but is not limited to, representatives from the Maine Pulp and Paper Association, the Small Woodlot Owners Association of Maine, the Professional Logging Contractors of Maine and the University of Maine. Ex officio members include staff from the offices of U.S. Senator Susan Collins, U.S. Senator Angus King and Congressman Bruce Poliquin.

Commission member Stephen Shaler, Director of the School of Forest Resources at the University of Maine, also serves on the Maine Forest Economy EDAT Planning Committee.

[16] http://www.mdf.org/publications/Maine-Forest-Economy-EDAT-Planning-Committee/893/

According to Shaler, members of the planning committee worked together to develop a long-term vision and roadmap for Maine's forest products sector. The planning committee's vision document was not public as of the writing of this report.

The commission recommends that the Maine Legislature take into consideration the federal EDAT report. However, the commission feels that the work of state forest industry leaders, namely the Maine Forest Economy EDAT Planning Committee, carries more weight and is more relevant. The Biomass Commission recommends that the Maine Legislature and forest economy stakeholders review and take into consideration the planning committee's long-term vision and roadmap and work together in developing a long-term strategy for Maine's forest-based economy.

As mentioned earlier, recent mill closures, in addition to other factors, including, but not limited to, lower world oil prices, lower regional electricity prices and changes in regional renewable energy markets have contributed to a decline in local markets for biomass fuel. These factors also put into question the economic viability of biomass electric generators. The Governor's Energy Office is required by law (Title 2, section 9, subsection 3, paragraph C) to update the state's Comprehensive Energy Plan every two years. The Energy Office plans to submit the next update in early 2018. As a result of these market changes, the Governor's Energy Office sought proposals to develop a current assessment of the economic sustainability of Maine's biomass industry to be included in the state's Comprehensive Energy Plan. The request-for-proposals (RFP) deadline was September 2016.

According to the Energy Office's RFP, "the goal of this assessment and analysis is to develop recommendations which, if implemented, would move the industry toward long-term economic sustainability." The scope of the analysis includes:

- An assessment of Maine's biomass industry, its current economic state and future outlook, with a focus on energy-related uses for biomass. This analysis will look at the entire supply chain – landowners, loggers, transporters, electric generators and other end-users;
- A review of the economic and environmental policies that affect Maine's biomass resource;
- An examination of the interconnection between economic markets for biomass and forest products and the energy policy of Maine Legislature;
- A description of recommended policy or program changes to create a sustainable future for the industry; and
- A cost-benefit analysis of leaving current policies in place versus updating state energy policies – taking into consideration the economic and environmental benefits of a sustainable biomass industry.

According to the Governor's Energy Office, the assessment of Maine's biomass industry will be released by the end of March 2017. As part of the contract, the consultant will present the final report's findings and recommendations to the Joint Standing Committee on Energy and Utilities. The Biomass Commission recommends that the Maine Legislature and biomass industry

stakeholders review the Governor's Energy Office report relating to the economie sustainability of Maine's biomass industry and work toward developing a long-term strategy for Maine.

4.2. Encourage the Maine Forest Service to support efforts toward fostering growth and innovation across Maine's forest products industry, including full utilization of recently awarded grants from the U.S. Department of Agriculture (USDA) for a State Wood Energy Assistance Team and the "Strengthening and Expanding Maine Wood Markets" project.

In May of 2016, the United States Department of Agriculture (USDA) awarded $380,170 in federal "Wood Innovation" grant funds to the Maine Forest Service (MFS) for the purpose of supporting efforts to foster growth and innovation across Maine's forest products industry with $130,170 to establish a Maine State Wood Energy Assistance Team and $280,000 for the "Strengthening and Expanding Wood Energy Markets" project.

In its grant application, MFS proposed to create a Maine State Wood Energy Assistance Team (MESWEAT) to coordinate the delivery of technical and financial assistance and to provide information and education to individuals, communities and organizations interested in wood energy projects. The team will be comprised of stakeholders from the industry, state government and nonprofit sectors. MESWEAT's overarching goal is to establish wood chip and pellet central heat and combined heat and power systems as mainstream alternatives to fossil fuels. According to the MFS grant application, the project will include outreach to current and potential users of wood energy, particularly in rural and underserved communities, and to current and potential suppliers of wood.

Additionally, MFS proposed to create a Forest Products Industry Development Specialist position as part of the "Strengthening and Expanding Wood Energy Markets" project. This specialist will serve as the single point of contact for issues related to forest products markets and help raise the profile of the forest products industry in economic development circles. According to the MFS's RFP, the specialist "will be expected to check in regularly with MFS and Maine Forest Products Council leadership on progress."

Both initiatives are three-year projects with required progress reports and a final report. The Biomass Commission supports both MFS projects.

Furthermore, the commission recommends the establishment of a position, similar to the Forest Industry Development Specialist, beyond the three-year project and for the long term. However, the commission feels the position does not necessarily have to be housed within MFS. The purpose of the position is to not only develop emerging and potential markets for forest products, but also to coordinate collaboration between the MFS, the Department of Economic and Community Development, the University of Maine System and industry stakeholders in working toward that goal.

4.3. Establish a program similar to the "Get Real. Get Maine!" campaign to encourage the use of Maine wood energy among residents to heat their homes, businesses and public institutions and to promote local forest products locally, nationally and globally.

The purpose of the Maine Department of Agriculture, Conservation and Forestry's "Get Real. Get Maine!" campaign is to connect consumers and wholesale buyers to Maine's food and farm products. The department maintains a "Get Real. Get Maine!" website where consumers can search for farms in their area, particular food and farm products, farmers markets and agricultural fairs in the state, and information on other events and resources to connect with Maine food and farm products.

Over 70% of Maine residents rely on oil to heat homes and businesses - the highest percentage in the nation.[17] According to the Maine Pellet Fuels Association, 78% of the money spent on heating oil, over $700 million annually, leaves Maine. Modern wood heat, also known as thermal biomass, has the potential to keep Maine dollars in the state. According to the Maine Pellet Fuels Association, expanding modern wood heat to 10% of Maine homes would keep hundreds of millions of fuel dollars in Maine, which in turn, would benefit our forest products industry and Maine residents and their communities.

On a larger scale, Maine must promote its incredible forest resources and other assets and seize more market share in national and global markets. Maine's geographical position is advantageous. It is in close proximity to the most heavily urbanized region of the United States, including cities like Boston, New York, Philadelphia and Washington, D.C. and is home to three significant deep-water cargo ports – Eastport, Searsport and Portland. Marketing and promoting the state's forest products with a campaign like "Get Real. Get Maine!" to consumers at home and abroad is important, but state and industry leaders must do more to attract capital investment in the forest products sector and to support research and development of new wood-based technologies.

Maine Forest Service Director, Doug Denico, stated in a 2013 report on the economic importance of Maine's forest-based economy, "Maine is unique in many ways from its competition. The state's proximity to deep water coastal ports, the eastern seaboard's consumptive population, transportation infrastructure, large private [forestland] holdings, entrepreneurial experience, research capability, Canadian provinces and sister states provide opportunities to rebound from market retrenchments. Very few states have such a list of positive influences."[18]

The Biomass Commission believes that promoting local wood leads to increasing the local good. The commission recommends that the State of Maine launch a campaign similar to "Get Real. Get Maine!" to promote, on the smaller scale, the use of local wood for heating Maine homes and businesses and, on the larger scale, Maine's many forest products to consumers at home and abroad. In addition, the commission recommends that the State of Maine and forestry industry leaders do more to attract investors and researchers in the forest products sector.

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[17] http://www.maine.gov/energy/fuel_prices/fuel-info.html
[18] http://www.maine.gov/dacf/mfs/publications/general_publications.html

4.4. Provide funding, through bonds and tax incentives, for research and development of new wood-based technologies and to get these new technologies from the incubator phase into the marketplace.

Maine is a leading producer of a wide variety of forest products, including but not limited to, biomass energy, including wood pellets; pulp and paper; lumber, plywood and veneer; and other value-added products, such as furniture and flooring. While these traditional forest products have been the mainstay of Maine's forest-based economy, the marketplace is shifting. Maine's abundant forest resource holds untapped potential for new innovative products, such as cross laminated timber (CLT), nanocellulose materials, cellulose-based plastics, biofuels and other biobased products.

At the third meeting, Commission member Stephen Shaler, Director of the School of Forest Resources at the University of Maine, presented information to the commission about the importance of research and development (R&D) in Maine's forest economy and the link between the forest resource; economics, markets and policy; and products and processing. Shaler gave many examples of industrial-sponsored research occurring at the University of Maine, including the Paper Surface Science Program; the Process Development Center; the study of wood composites at the Advanced Structures Composites Center; and the Advanced Machining Center. The nanocellulose research and development facility at the Process Development Center is one particularly cutting-edge program at the University of Maine.[19]

As mentioned earlier in the report, the federal government awarded $7.7 million to help Maine diversify its forest-based economy.[20] This includes a $519,930 grant to Biobased Maine as part of a three-year $856,549 project in partnership with the University of Maine and the Environmental Health Strategy Center to develop a road map to advance biobased manufacturing in Maine.[21] The project titled, "Diversifying Maine's Forest-based Economy: Biobased Manufacturing from Renewable Biomass" includes three primary tasks:

1. Draft a road map to biobased manufacturing in Maine;
2. Market Maine's biobased assets to the global biotechnology industry; and
3. Accelerate the manufacture of cellulosic sugars at Maine's remaining pulp and paper mills.

Biobased Maine is a business-led trade association working to advance biobased manufacturing in Maine. Biobased products are made from renewable plant material, like woody biomass from forests, agricultural waste from farms, and algae (ocean biomass) from the sea. Examples of biobased products include biobased chemicals, advanced biofuels, bioplastics and advanced materials, such as nanocellulose. According to Charlotte Mace, executive director of Biobased Maine, global demand for biobased products is rising sharply.

Biobased Maine believes that Maine has an opportunity to grab some of this market share, which would, in turn, create manufacturing jobs in rural areas of the state, potentially in the very

[19] Nanocellulose is wood fiber broken down to the nanoscale and has many potential applications including medical, automotive and electronics applications.
[20] http://www.mainebiz.biz/article/20160801/NEWS01/160809993/feds-deliver-$77-million-to-diversify-maine's-economy
[21] Ibid.

communities that have been negatively impacted by recent mill closures, and also create markets for low-quality forest residuals, such as biomass and softwood. Furthermore, Mace believes that Maine has the tools to support biobased manufacturing: an abundant forest resource and corresponding residuals (biomass); idle industrial infrastructure (recently closed mills); a strong workforce; transportation assets; and world-class research and development (R&D) at the University of Maine.

As mentioned earlier in this report, the commission discussed the Biochemical Producer Payment Program. In addition to the biomass thermal production incentive, the program includes an advanced biofuel production and renewable chemical production incentive. Minnesota has also provided a long-term loan to renewable biochemical producers. The loan is to be used to construct a biochemical production facility that will use local timber to produce high-value industrial alcohol and activated carbon.[22]

The commission briefly discussed these approaches and feels these Minnesota proposals should be considered in Maine. The commission supports creative incentives to get innovative biobased technologies from the incubator phase into the market place. State support for these programs signals to producers that Maine has a welcoming business climate for biobased business and may help encourage those businesses to locate or stay in the state.

During the First Regular Session of the 127th Maine Legislature, LD 1053, An Act To Authorize a General Fund Issue to Stimulate Investment in Innovation by Maine Businesses to Produce Nationally and Globally Competitive Products and Services, was introduced. The bill was carried over to the Second Regular Session and was eventually passed by the Legislature and became Public Law 2015, chapter 479. The law provides for a bond issue totaling $50 million with $45 million to be used for investment in infrastructure, equipment and technology upgrades to further research, development and commercialization in Maine's seven targeted technology areas, which are biotechnology, composites and advanced materials, environmental technologies, forest products and agriculture, information technology, marine technology and aquaculture and precision manufacturing. The remaining $5 million would be used to recapitalize the State's Small Enterprise Growth Fund, which provides funds to qualifying businesses with 50 or fewer employees and gross sales not exceeding $5 million annually. The bond issue is subject to voter approval at a statewide election to be held in June 2017.

Generally, commission members feel that this recent bond legislation, if approved by voters in June 2017, is a step in the right direction, but it does not go far enough. The commission recommends the 128th Maine Legislature develop a bond package and consider tax credits to support and increase R&D projects in Maine and to incentivize the movement of current projects from the R&D incubator phase into the marketplace.

Goal 5: Create state policies that encourage biomass energy production and heating with biomass.

While amending the RPS, encouraging CHP systems, or allowing the use of microgrids are important steps to promote the use of biomass, the commission considers broader overarching

[22] http://sweetwater.us/minnesota-awards-26-million-to-fund-sweetwaters-biochemical-facility/

statements regarding the production of heat and energy using biomass to be essential to the promotion of energy efficient biomass facilities. By adopting policies that clearly demonstrate the value the state sees in using biomass for the production of heat and energy this can lead to greater in-state investments and send a signal that Maine is a state that welcomes the use of biomass. It also provides a more holistic approach signaling a preference for the use of biomass and the other recommendations in this report are the tools to encourage investment and move to systems that are more efficient.

Recommendations

5.1. Through statutory changes, categorize biomass-derived carbon dioxide emissions as carbon neutral and exempt from regulation under certain air pollution laws.
As a matter of policy, in its report, "Sixth Biennial Report on Progress Toward Greenhouse Gas Reduction Goals," the Maine Department of Environmental Protection (DEP) states that when quantifying emissions from the energy source category the department classified the combustion of renewable resources as carbon neutral; therefore, carbon dioxide emissions from the combustion of biomass are not captured.[23]

While biomass is considered carbon neutral for the purposes of this DEP report, there is no explicit statement in law that specifies that biomass combustion is carbon neutral. The commission suggests that the state follow the lead of other states and specifically categorize biomass combustion as carbon neutral. The commission suggests that if an analysis is undertaken to consider carbon neutrality, the Maine DEP in consultation with the Department of Agriculture, Conservation and Forestry should complete this endeavor. The analysis should look at the science as well as forest sustainability in context of a policy that declares biomass carbon neutral.

Below are some examples of laws in other states regarding the carbon neutrality of biomass:

Minnesota	Minn. Stat. Ann. §216B.1696	Includes biomass in the definition of carbon neutral "clean energy technology." Statute specifically addresses energy-intensive, trade-exposed industries.
Oregon	ORS §468A.020	States that biomass combustion and decomposition does not generate carbon dioxide emissions. Specifically provides an exception to this determination with regards to any enforcement required under the federal Clean Air Act.
Washington	RCW §19.285.030	Recognizes wood-derived biomass as a renewable, carbon neutral fuel for generating electricity under state law.

The commission is also aware that the federal government is currently contemplating the concept of biomass carbon neutrality. The commission endorses that change at the federal level, but it does do not advocate waiting for that to happen. The commission recommends taking this step forward at the state level to send a signal that Maine is a place to invest resources to develop biomass electric production facilities and to keep those existing facilities operational.

[23] http://www.maine.gov/tools/whatsnew/attach.php?id=667449&an=1

5.2. Encourage the Governor's Energy Office to make biomass a more focused, greater priority in Maine's Comprehensive Energy Plan.

As stated earlier in this report, every two years the Governor's Energy Office (GEO) updates its Comprehensive Energy Plan. While the current plan does mention biomass, it is generally in context of all renewable resources. The commission recommends that the GEO make biomass energy production a greater focus in its report. Again, this would send a signal that the state welcomes investments in biomass. The GEO plan should discuss the value of biomass and the important role it plays in supporting Maine's forest-based economy.

In the last GEO plan's policy recommendations section, one recommendation was to "work with all New England states to align the various renewable portfolio standards/renewable energy credit (REC) markets where possible."[24] The recommendation explains that having six different renewable portfolio standards in each state creates an inequitable REC market, which can lead to ineffectiveness.[25] The plan states, "if the region's RPS policies were aligned, there would be a uniform, regional REC price, and all renewable generators would operate on a 'level playing field'."[26] The commission applauds this policy recommendation and hopes that it be included in the next updated plan, as the New England REC market has yet to reach that uniformity.

IV. CONCLUSION

The term "biomass" goes beyond the production of energy, which is why moving forward the commission recommends that a holistic approach be taken to address the biomass industry. The state needs to recognize the interconnected nature of the biomass industry. The loss of one segment, such as a standalone biomass facility, can have negative impacts on logging operations, sawmills, trucking and equipment businesses and many others associated with Maine's forest-based economy. It will not be enough to simply make a change to benefit one segment of the industry. The commission strongly believes that its recommendations will make Maine's biomass industry more robust and less fragile.

However, it is important that we do not proceed without looking at what others are recommending and doing. As discussed within this report, the federal EDAT report should be released within a few months, and the assessment of the economic sustainability of Maine's biomass industry to be included in the Governor's Energy Office's Comprehensive Energy Plan should be available in March or April 2017. More importantly, the Maine Forest Economy EDAT Planning Committee, comprised of forest industry leaders and stakeholders, will soon release its roadmap for the State's forest-based economy. It will be important to consider what is included in these reports to avoid duplicative or conflicting efforts.

If we work together and make well-informed decisions, Maine's biomass industry not only can be assisted, but also can flourish. The state has a rich resource, a long history of that resource

[24] http://maine.gov/energy/pdf/2015%20Energy%20Plan%20Update%20Final.pdf.
[25] Ibid.
[26] Ibid.

being a part of the economy and so many important components of the infrastructure in place to be a leader, not only in biomass energy production, but also in innovative uses for biomass from biofuels to building materials.

APPENDIX A

Authorizing Joint Order, Resolve 2015, ch. 85

LAW WITHOUT GOVERNOR'S SIGNATURE

APRIL 28, 2016

CHAPTER

85

RESOLVES

STATE OF MAINE

IN THE YEAR OF OUR LORD

TWO THOUSAND AND SIXTEEN

H.P. 1158 - L.D. 1693

Resolve, Establishing the Commission To Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry

Sec. 1. Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry established. Resolved: That the Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry, referred to in this resolve as "the commission," is established; and be it further

Sec. 2. Membership. Resolved: That, notwithstanding Joint Rule 353, the commission consists of 13 members appointed as follows:

1. Two members of the Senate appointed by the President of the Senate, including a member from each of the 2 parties holding the largest number of seats in the Legislature;

2. Three members of the House of Representatives appointed by the Speaker of the House, including a member from each of the 2 parties holding the largest number of seats in the Legislature;

3. Four members appointed by the President of the Senate as follows:

A. A commercial wood harvester who supplies biomass;

B. A representative of the biomass electric industry;

C. A representative of a sawmill located in the State; and

D. A scientist from the University of Maine who studies forest health and silviculture; and

4. Four members appointed by the Speaker of the House as follows:

A. A representative of a conservation organization;

B. A representative of a pulp and paper manufacturer located in the State;

C. A representative of commercial timber holdings in the State; and

D. A representative of a business that uses biomass for thermal generation or cogeneration or an expert in the use of biomass energy for thermal generation or cogeneration; and be it further

Sec. 3. Commission chairs. Resolved: That the first-named Senator is the Senate chair of the commission and the first-named member of the House of Representatives is the House chair of the commission; and be it further

Sec. 4. Appointments; convening of commission. Resolved: That all appointments must be made no later than 30 days following the effective date of this resolve. The appointing authorities shall notify the Executive Director of the Legislative Council once all appointments have been made. When the appointment of all members has been completed, the chairs of the commission shall call and convene the first meeting of the commission. If 30 days or more after the effective date of this resolve a majority of but not all appointments have been made, the chairs may request authority and the Legislative Council may grant authority for the commission to meet and conduct its business; and be it further

Sec. 5. Duties. Resolved: That the commission shall:

1. Review and evaluate the economic, environmental and energy benefits of Maine's biomass resources, as well as public policy and economic proposals to create and maintain a sustainable future for the Maine biomass industry;

2. Consider the interconnection of economic markets for biomass and forest products and the energy policy of the State;

3. Consider whether the environmental, economic and energy benefits of biomass support updating the State's energy policy to strengthen and increase the role that biomass and the forest products industry play throughout the State;

4. Consider the costs of implementing any recommendations and the effect of leaving current policies in place; and

5. Examine any other issues to further the purposes of the study.

In conducting the duties under this section, the commission shall seek public input and shall consult and collaborate with stakeholders and experts in the fields of economic development, natural resources and energy policy; and be it further

Sec. 6. Meetings. Resolved: That the commission shall hold at least 4 meetings; and be it further

Sec. 7. Staff assistance. Resolved: That the Legislative Council shall provide staffing services to the commission. The commission may invite the Department of Economic and Community Development, the Public Utilities Commission, the Office of the Public Advocate, the Governor's Energy Office, the Efficiency Maine Trust, the Department of Agriculture, Conservation and Forestry and other appropriate agencies of State Government to provide additional staff support or assistance to the commission; and be it further

Sec. 8. Report. Resolved: That the commission shall submit a report and any suggested implementing legislation for presentation to the Joint Standing Committee on Energy, Utilities and Technology and the Joint Standing Committee on Agriculture, Conservation and Forestry no later than December 6, 2016.

APPENDIX B

Membership list

Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry
Membership List
August 1, 2016

Appointments by the President

Senator Thomas B. Saviello - Chair 60 Applegate Lane Wilton, ME 04294	Members from each of the two parties holding the largest number of seats in the Legislature
Senator James F. Dill 72 Sunset Drive Old Town, ME 04468	Members from each of the two parties holding the largest number of seats in the Legislature
Jason Brochu Pleasant River Lumber PO Box 68 Dover-Foxcroft, ME 04426	Representative of a sawmill located in the state
Robert Cleaves Biomass Power Association PO Box 9729 Portland, ME 04104	Representative of the biomass electric industry
Steve Hanington Hanington Brothers, Inc. 488 US Rt. 2 Macwahoc Plantation, ME 04451	Commercial wood harvester who supplies biomass
Stephen Shaler University of Maine 201 Nutting Hall Orono, ME 04468	Scientist from University of Maine who studies forest health and silviculture

Appointments by the Speaker

Rep. Jeff M. McCabe - Chair 13 Olive Street Skowhegan, ME 04976	Members from each of the two parties holding the largest number of seats in the Legislature
Rep. Norman E. Higgins PO Box 594 Dover-Foxcroft, ME 04426	Members from each of the two parties holding the largest number of seats in the Legislature
Rep. Deane Rykerson 1 Salt Marsh Lane Kittery Point, ME 03905	Members from each of the two parties holding the largest number of seats in the Legislature

Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry
Membership List
August 1, 2016

Thomas Abello The Nature Conservancy 14 Maine Street, Suite 401 Brunswick, ME 04011	Representative of a conservation organization
John Bryant 901 Mann Hill Road Holden, ME 04429	Representative of commercial timber holdings in the state
Robert Linkletter Maine Woods Pellet Co. LLC PO Box 120 Athens, ME 04912	Representative of a biomass that uses biomass or an expert in the use of biomass
Ryan McAvoy Sappi North America 165 North Street, Suite 1 Skowhegan, ME 04976	Representative of a pulp and paper manufacturer located in the state

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Staff:
Deirdre Schneider, Legislative Analyst
Karen Nadeau-Drillen, Legislative Analyst
Office of Policy and Legal Analysis

APPENDIX C

Written Public Comments – After November 1, 2017 Meeting

Comment submitted by ReEnergy – 11/09/16

RPS Redesign

Create a carve-out class for biomass electricity providing economic benefits in Maine

Effective 2018 (possibly 2019), each Load-Serving Entity (LSE) in Maine would be required to supply Maine Economic Benefit RECs (MEBREC) in a volume equal to or greater than 5% of the total megawatt-hours (MWh) of load served per year (about 600k). This 5% amount would be fixed each year and would not increase over time. This 5% would be a subset of the 10% Class I compliance, meaning the total volume compliance requirement for an LSE would not increase. The alternative compliance payment (ACP) for the MEBREC would not be the same as the standard Class I ACP for any given year ($67.07 in 2015). Other compliance provisions for LSEs would be the same as regular Class I RECs (with respect to banking, data submittal to PUC, etc.)

A MEBREC-eligible generator would need to be a Maine Class I eligible generator. In addition, the generator must demonstrate that it creates direct economic benefits to the State per MWh in excess of the most recently posted MEBREC ACP. For 2018 vintage, this would likely be in the range of $68-$70 per MWh. The generator must provide data to MPUC to substantiate the claim in an initial petition, and also continue to provide on an annual basis in order to maintain eligibility. These economic benefits must be directly associated with the production of renewable energy and not any other product or process at a multi-use facility (pulp/paper mill, etc).

MWh from a MEBREC generator would be classified in NEPOOL GIS and NAR as both MEBREC and Maine Class I REC. However, each REC can only be claimed by an LSE in one category (as is the case now with generators holding a multiple-state eligibility status.) This avoids any double-counting concern while providing the generator with continued flexibility to serve demand for either MEBREC or Maine I REC.

Extend the ME Class I compliance schedule

The current Class I compliance schedule is below. The increase ends in 2017:

2008: 1%	2010: 3%	2012: 5%	2014: 7%	2016: 9%
2009: 2%	2011: 4%	2013: 6%	2015: 8%	2017+: 10%

We propose an extended Class I compliance schedule. This would be in line with actions taken by other states:

2018: 11%	2019: 12%	2020: 13%	2021: 14%	2022: 15%
2023: 16%	2024: 17%	2025: 18%	2026: 19%	2027: 20%

Create an adjunct class for thermal energy

We propose to add a thermal adjunct class, effective for systems that are installed and operating after 1/1/16 with a MMBtu-MWh conversion rate of 3.412. These systems – biomass thermal (solid fuel, liquid fuel and biogas); geothermal; and active solar thermal -- would be eligible for RECs in the 2018 compliance year. This would incentivize the installation of thermal systems to displace heating oil and keep an estimated $40 million in imported oil expenditures in the Maine economy, where the economic impact multiplies 3-4 times.

The proposed thermal adjunct class compliance schedule would be as follows, and would be additive to the proposed compliance schedules above.

2018: 0.2%	2019: 0.5%	2020: 1%	2021: 1.5%	2022: 2%
2023: 2%	2024: 2%	2025: 2%	2026: 2%	2027+: 2%

These proposals build on existing policy and include compliance requirements that are in line with other New England states. In addition, New Hampshire and Massachusetts have revised their renewable energy policy to allow thermal energy projects to monetize their renewable energy attributes.

Encourage behind-the-meter projects to allow for development of combined heat and power projects and direct sale of energy to benefit both generators and consumers.

We recommend that state law allow biomass generators the ability to sell energy via direct connections between generator and consumer. The impact could be limited by requiring a critical 'forest products' nexus between the parties. This would ensure the economic benefit stays within the forest products industry while maintaining the overall energy restructuring restrictions in Title 35-A.

A real-world example of this could be the creation of a pilot "Biomass Energy Park" program in Aroostook County. Under this proposal, a biomass generator would provide behind-the-meter electricity to commercial consumers involved in the forest products industry. Similar to the logic behind the Pine Tree Development Zone program (30-A §§5250-H – 5250-P), this virtual business park would encourage economic development in Aroostook County by lowering energy costs for participating businesses. This would allow growing businesses to stay in The County while encouraging others to relocate.

In addition to requiring a forest products nexus for participating businesses, this program could be further tailored by capping MW sales to consumers and by limiting the duration of this pilot program. These three program controls (nexus, sales cap, duration limit) would allow realization of the program's economic benefits without directly threatening a T&D's exclusive franchise model.

Recognizing that T&D utilities are critical stakeholders in Maine's energy landscape, another recommendation would be to follow Connecticut's lead and require electric distribution companies to pursue pilot projects involving the integration of distributed energy resources (DERs) into the wider grid. Understanding how microgrids and other DERs can be aggregated to provide power will help Maine transition to a smarter grid.

On the regulatory front, the Commission could explore policies aimed at reducing distribution rates between the local T&D utility and Maine's forest products businesses. Currently, in the Maine Public District, Emera Maine has multiple distribution rates, including a Pilot Pine Tree Zone rate and another Economic Development rate. These are reduced distribution rates designed to encourage business expansion or relocation to Aroostook County. These could provide a model for a reduced "forest products" rate to covered businesses in Northern Maine and in conjunction with the above statutory changes, could provide the broad outlines for a microgrid pilot.

The PUC could also provide a program to fund feasibility studies for community microgrids, as has been done recently by the New Jersey Board of Public Utilities and the New York State Energy and Research Development Authority. Regulation also could be promulgated to require electric distribution companies to demonstrate and investigate the integration of distributed energy resources (as has been done by the New York Public Service Commission).

In addition to microgrid development, the State should encourage greater use of biomass facilities as combined heat and power (CHP) generators. Providing thermal energy and electric power increases the efficiency of using biomass fuel and makes standalone facilities more attractive to potential businesses. As we heard during the Stratton Lumber tour, co-location is the goal as it reduces the business's costs while providing stability to both generator and consumer.

Encouraging co-location will allow pre-existing biomass facilities to market themselves as lower cost thermal and electric providers. And because these biomass generators would be large CHPs, the potential exists to attract equally large co-located businesses or manufacturers.

In furtherance of this goal, we also recommend that policies be identified to incentivize co-location. The state's Pine Tree Development Zones program also offers a template that could be further focused on the biomass and forest products industries. Additional marketing by the state's DECD office would underscore the financial appeal of these areas.

Maine Pellet Fuels Association

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Principles to Guide Addition of Thermal Renewable Energy To a State Renewable Portfolio Standard

1. **Fuel and technology neutrality**

Recognizing thermal renewable energy should apply without prejudice to **any** legitimate\renewable thermal energy technology, including biomass, solar, and geothermal.

2. **Renewable energy certificates price must serve as effective incentive**

Thermal RECs should be have a **prescribed ceiling** price that will provide a meaningful and effective price signal for market development. For example, a price of $25/MWH for biomass projects provides a meaningful incentive to spur new project development, and is consistent with current or anticipated pricing in NH and MA.

3. **Thermal should be recognized through a class structure that is independent of electric renewable technologies**

Thermal renewable energy is fundamentally different than electric renewable energy. The addition of thermal renewable energy should be structured with a **dedicated class** with its own ceiling price and REC purchase mandate. The market for thermal RECs should operate independent of the market for electric RECs.

4. **The thermal REC purchase mandate should be meaningful, and phased in gradually over a period of ten or more years**

This will allow for orderly growth in the market, and allow technology providers and project developers to respond to a predictable market demand for thermal RECs with projects that can take several years to develop. The purchase mandate should be aggressive but achievable; in other words, the size of the mandate should have a meaningful impact on market growth so that a critical mass in the market can be achieved within 10 years, whereby thermal REC or other incentives may no longer necessary and can be phased out.

5. **A thermal RPS program should not discriminate for or against projects based on their size or anticipated thermal REC output**

Projects of any size should be able to qualify, from small residential to large industrial. However, there can be practical limitations that may make qualification and verification of heat generation of small projects infeasible or uneconomic. Regulators may want to create different thresholds of technical requirements for different size classes of projects, while ensuring that fundamental accountability or integrity of the program is not compromised.

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6. Leave as much of the details as possible to administrative rulemaking

A thermal REC provision in an RPS will certainly require modifications and improvements to ensure that is provides a meaningful incentive over time and through unanticipated changes in the market. The law and regulations should be devised to enable straightforward, efficient reforms through regulatory rulemaking, without lengthy legislative deliberation.

7. **Don't saddle thermal renewable technologies with unreasonable and unenforceable technical requirements**

It is best to devise an initial thermal renewable provision with reasonable environmental or sustainability safeguards that can be cost effectively achieved. If experience dictates that safeguards need to be strengthened, they can always be revisited. If the regulations set an unrealistic and unattainable expectation that the market is not ready to adopt, it may predispose the policy to failure from the beginning. Regulations should never be imposed that cannot be efficiently and cost effectively enforced by the responsible agency.

8. Only new projects should qualify for thermal RECs

Legislation should set a **"begin service date"** at some point in the future. Only projects commissioned and operating after that date should qualify for thermal RECs, so that the incentive supports and encourages new project development. Otherwise, pre-existing projects that came on line without the benefit of this incentive could flood the market and depress thermal REC price.

William Bell, Executive Director
November 16, 2016

APPENDIX D

Written Public Comments – After December 5, 2017 Meeting

Natural Resources Council of Maine
3 Wade Street • Augusta, Maine 04330 • (207) 622-3101 • Fax: (207) 622-4343 • www.nrcm.org

December 8, 2016

To: Senator Tom Saviello, Representative Jeff McCabe, Biomass Study Commission members

Re: Comments on the December 2, 2016 draft biomass recommendations

Dear Senator Saviello, Representative McCabe, and members of the Biomass Study Commission:

NRCM offers the following comments on the draft biomass goal recommendations:

1.1 In principle, NRCM supports creating a thermal class in the Renewable Portfolio Standard (RPS) to incentivize efficient thermal and combined heat and power (CHP)biomass, although it is very important to get the specifics right for such a complex policy. To be consistent with the goal of increasing the efficiency with which biomass energy is used in the state, we strongly believe a new thermal class should come from within the existing Class I RPS requirement, which today is almost entirely met by inefficient biomass electric plants.

1.2 We strongly agree with the conclusion that the current statutory requirement of a 10% RPS persists past 2017, and that this requirement will not increase without additional policymaking. NRCM would only support a significant expansion of the Class I RPS in the context of a larger review that extends beyond biomass issues and improves the effectiveness of the policy. Without reform, expansion of the RPS will likely serve only to exacerbate ratepayer support for inefficient biomass electricity generation without benefitting other forms of renewable energy.

1.3 NRCM opposes tying renewable energy credits (RECs) directly to jobs. The RPS is a market-based policy that seeks renewable energy generation at the lowest cost. Having ratepayers pay for generation based on a subjective assessment of job creation will result in higher costs. The legislature has repeatedly recognized that renewable energy development in general creates jobs and economic development for Maine. However, tying RECs directly to jobs would create a perverse incentive for renewable energy projects to employ as many workers as possible whether or not they need to, increasing costs for ratepayers and interfering with market competition to produce energy efficiently. Finally, Maine's standalone biomass plants currently receive 92% of the revenues from purchase of Maine's RECs[1]. The legislature should not provide additional subsidies to biomass electric plants at the expense of other forms of renewable energy.

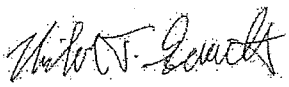
[1] Maine Public Utilities Commission. 2016. Annual Report on New Renewable Resource Portfolio Requirement. March 31. p. 7.

2.2 & 2.3 These recommendations should include purely thermal biomass that is high efficiency as well as CHP. As the Commission is aware, Efficiency Maine already has some incentives available both for CHP and high-efficiency biomass thermal installations, including at schools and other institutions. NRCM is generally supportive of additional incentives, with two caveats. First, additional funding sources must be identified, which will be challenging. All of Efficiency Maine's existing funds are currently being spent on highly cost-effective energy efficiency and renewable energy projects and simply re-directing them to favor thermal and CHP biomass more is unlikely to yield a net benefit for Maine energy consumers.

5.1 Biomass burning is not carbon neutral, and NRCM strongly opposes this recommendation. The carbon benefits, or lack thereof, of burning wood depend on a complex set of factors, including combustion efficiency, source of the wood, and the amount of fossil fuel used to transport and harvest the wood. Stating that all woody biomass is carbon neutral is a gross oversimplification of a very complex problem. A blanket determination that biomass is carbon neutral completely removes the efficiency of burning and the amount of fossil fuels it displaces from the equation when considering atmospheric impacts. It allows the absurd conclusion that burning a ton of wood in a bonfire for a party and displacing zero fossil fuel would have the same impact on atmospheric carbon as burning a ton of wood in a high efficiency wood stove and displacing a hundred gallons of heating oil. The carbon benefits, or lack thereof, of burning wood depend on a complex set of factors, including combustion efficiency, source of the wood, and the amount of fossil fuel used to transport and harvest the wood. Stating that all woody biomass is carbon neutral is a gross oversimplification of a very complex problem.

5.2 As we have stated in previous testimony, NRCM would support an aggressive program to increase biomass use in high-efficiency thermal and CHP facilities. The state's Comprehensive Energy Plan, such as it is, should emphasize these types of facilities rather than stand-alone biomass electricity generation.

Sincerely,



Nick Bennett
Staff Scientist

Comments on the Goals and Recommendations of the Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry

by James St. Pierre, Maine Director, RESTORE: The North Woods
December 8, 2016

Below are comments on the December 2, 2016, Goals and Recommendations of the Commission to Study the Economic, Environmental and Energy Benefits of the Maine Biomass Industry (Maine Biomass Commission). These goals and recommendations have been prepared after five public meetings and site visits to a biomass logging operation, a sawmill that creates "waste" that is used in an adjoining bioenergy plant, two biomass energy facilities, and a pellet plant that uses heat and power from an adjoining bioenergy facility. Because Maine has a substantial history with biomass logging and generating bioenergy from wood, it is important to consider the Commission's recommendations in a larger context.

Credentials

I have four decades of experience working on Maine forest issues. Following graduation from the University of Maine with a master's degree in resource economics, I worked for the Maine Department of Conservation for thirteen years (1976-89). Since then, I have worked in Maine on forest issues for public interest organizations for more than a quarter century. I participated in dozens of meetings and hearings during the Northern Forest Lands Study and Northern Forest Lands Council process (1990-94). I have testified before numerous legislative and congressional committees. I have lobbied for passage of the Forest Legacy Program, appropriations under the Land & Water Conservation Fund, Land for Maine's Future program, and other conservation funding. I have visited many of the stand-alone biomass plants in Maine. I attended nearly all the meetings and participated in all the site visits held by the Maine Biomass Commission. RESTORE: The North Woods has been involved in forest, wildlife, and land use issues in Maine for nearly 25 years.

Maine's experience with bioenergy

In the 1980s, Maine was a biomass pioneer. With great optimism, the state and the forest industry advocated the burning of forest biomass to produce energy as a win-win proposition. It was touted as a new use for low-grade wood and forest "waste" byproducts such as tree branches that are too small to be used to make solid wood products or to be pulped for paper. It was pushed as a new market to fund pre-commercial thinning of woodlands, large and small. Landowners were told they could be paid to have their woodlots weeded. And forest biomass was promoted as a replacement for fossil fuels that is a nonpolluting, renewable resource to generate electric power. Money was invested, plants were built, power began flowing, studies were undertaken.[1] However, few of the benefits of biomassing Maine's forests worked out as advertised.

[1] See reports of the Biomass Harvesting Strategy Task Force, April 1985; Biomass Research Committee, 1985; Residential Wood Use in Maine, 1980 – 1988, January 1989; Wood-fired Electric Generating Industry in Maine, 1992; biomass harvesting demonstration projects in the I-95 median; biomass harvesting demonstrations on public forest lands; and Waste Wood Working Group; all cited in U.S. Department of Energy, 1995, Northeast Regional Biomass Program Retrospective: 1983-1993, pp. 35-37, https://digital.library.unt.edu/ark:/67531/metadc679196/m2/1/high_res_d/465907.pdf

In the 1990s, the effort to make Maine a national bioenergy powerhouse began to unravel as investors sailed into a perfect storm of turmoil. First, traditional forestland ownerships were broken up and sold off. The supply side of the biomass market slid into chaos. Second, paper mills, which had been an economic backbone of Maine's economy, started to close in the face of global competition. Out-of-state executives got rich, but thousands of woods and mill workers in Maine lost their jobs. Third, bioenergy plants in Maine began to shut down when it became clear they were not cost competitive. Stand-alone plants were closed, such as Beaver in Chester (1992)[2] and Gorbell in Athens (1995), as well as biomass boilers, such as at the Kimberly-Clark paper mill in Winslow.[3] The demand side of the Maine biomass market shrank.

During the first decade of the 21st century, the trends toward collapse of Maine's bioenergy experiment accelerated. Additional large forestland ownerships in Maine disintegrated as 10+ million acres of forestland were sold, often at fire sale prices. More Maine paper mills closed as global competition increased. And in light of falling oil prices and the expansion of natural gas pipelines more bioenergy plants failed: Foster in Strong (2003) and Boralex in Stacyville (2009), for instance.

Despite the setbacks, by 2015 Maine was ranked #1 in the United States in biomass electric generation per capita.[4] Twenty-six percent of Maine's net electricity generation came from biomass.[5] But that has masked a phalanx of forces pushing against the industry.[6]

By the spring of 2016 the bioenergy industry in Maine was facing a combination of pressures, including warm winter temperatures, low oil, natural gas and electricity prices, the end of above market payments by Massachusetts and Connecticut, and the resulting imminent closure of bioenergy plants in Jonesboro and West Enfield.

In response to what was described as an "economic hurricane,"[7] an unprecedented "crisis,"[8] and an "economic collapse never before seen in Maine,"[9] the Maine Legislature passed two measures. The first was emergency legislation (L.D. 1676) authorizing a $13.4 million taxpayer bailout aimed at keeping the two Covanta bioenergy plants running.[10] Covanta said it would close the plants anyway. The second, a Resolve (L.D. 1693) introduced after the normal deadline, set up the Maine

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[2] Nick Sambides, Purchase sparks hope of energy plant's revival, Bangor Daily New, March 8, 2066, http://archive.bangordailynews.com/2006/03/08/purchase-sparks-hope-of-energy-plants-revival/

[3] Associated Press, Kimberley-Clark to close paper mill in Maine, November 21, 1997, http://www.apnewsarchive.com/1997/Kimberly-Clark-to-close-paper-mill-in-Maine/id-892c89d42c00fabfac0b3fff3dc6c29e

[4] U.S. Energy Information Administration, Maine Profile Analysis, June 16, 2016, https://www.eia.gov/state/analysis.cfm?sid=ME

[5] American Society of Civil Engineers, Report Card for Maine's Infrastructure 2016, November 28, 2016, http://www.mewea.org/wp-content/uploads/2016/12/Maine-Report_Card_final_booklet.pdf

[6] Marc Heller, Biomass goes from golden age to the brink of demise, E&E News, March 9, 2016, http://www.eenews.net/greenwire/2016/03/09/stories/1060033691

[7] Steve Mistler, Legislators approve $13.4 million bailout of Maine biomass industry, Portland Press Herald, April 15, 2016, http://www.pressherald.com/2016/04/15/legislators-approve-13-4-million-public-bailout-of-biomass-industry/

[8] Dana a. Doran, Executive Director, Professional Logging Contractors of Maine, Testimony regarding LD 1693, April 6, 2016.

[9] Bob Cleaves, Biomass at a Crossroads, Biomass magazine, April 23, 2016, http://www.biomassmagazine.com/articles/13141/biomass-at-a-crossroads

[10] Maine Legislature, Public Law, Chapter 483, April 16, 2016, http://www.mainelegislature.org/legis/bills/getPDF.asp?paper=SP0689&item=9&snum=127

Biomass Commission to "Review and evaluate the economic, environmental and energy benefits of Maine's biomass resources, as well as public policy and economic proposals to create and maintain a sustainable future for the Maine biomass industry."[11]

The Commission's mandate and goals are not balanced

Unfortunately, the legislation authorizing the Maine Biomass Commission failed to provide for a balance. Rather than a charge to fairly address the benefits and costs of biomass, the commission was tasked to look at only at one side of the equation. The failure to address both benefits and costs introduced a serious bias and severely undermines the credibility of the Commission's recommendations.

The Maine Biomass Commission has articulated five goals:

1. Encourage investment in biomass facilities and promote greater efficiency.

2. Encourage investments in combined heat and power systems to promote efficiency.

3. Enable and encourage co-location and other innovative projects utilizing behind-the-meter technologies to incentivize manufacturing growth and increase system reliability.

4. Promote and develop Maine's forest-related resources in-state and abroad, and take advantage of federal grant funding and other collaborative efforts to bolster the forest-based economy in Maine.

5. Create state policies that encourage biomass energy production and heating with biomass.

All of these goals assume that more biomass is good for Maine's economy, Maine's energy mix, and Maine's natural environment. Those assumptions do not appear to be supportable.

Economy and Energy

Maine has experienced the closing of numerous pulps and paper mills and a subsequent collapse of the softwood pulp market. From 1980 to 2016, two-thirds of Maine's remaining 25 paper mills were shuttered, most others were struggling, thousands of mill and woods workers lost their jobs, and mill towns were economically devastated. In the past two years alone, pulp/paper mills in Auburn, Old Town, East Millinocket, Lincoln, Madison, and Bucksport have closed.[12] At the same time, several biomass electric facilities and pellet mills shut down.[13]

In response, to salvage some jobs, including in the bioenergy sector:

- The Finance Authority of Maine authorized $12 million in Maine New Market tax credits to leverage $30 million in investment[14] and the federal government has granted $557,000 to subsidize a new biomass plant in Athens.[15]

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[11] Maine Legislature, Resolve 2015, Chapter 85, http://www.mainelegislature.org/legis/bills/getPDF.asp?paper=HP1158&item=3&snum=127

[12] RESTORE: The North Woods, Maine Pulp & Paper Mills, 1980-2016.

[13] Dana a. Doran, Executive Director, Professional Logging Contractors of Maine, Testimony regarding LD 1693, April 6, 2016.

[14] Darren Fishell, Athens biomass plant to get $30 million investment, Bangor Daily News, July 21, 2014, http://bangordailynews.com/2014/07/21/business/athens-biomass-plant-to-get-30-million-investment/

• Efficiency Maine has provided $500 to $5000 incentives to get homeowners, schools and municipalities to shift to pellet stoves and biomass boilers.[16] The subsidies have prompted hundreds of conversions irrespective of the environmental impacts.

• The USDA Biomass Crop Assistance Program (BCAP) "encourages the use of low-value organic material, mostly forest debris, to create energy at biomass facilities." By 2011, Maine had reportedly received more money than any other state.[17]

• Direct grants (in lieu of tax credits) totaling millions of dollars have been made to forestry companies operating biomass facilities at their mills in Maine under the U.S. Treasury's Recovery Act, Section 1603 Program. In 2012, Irving Forest Products received payments of more than $313,000. In 2013, Verso got $13,653,000 for its biomass plant in Bucksport and an additional grant from Efficiency Maine.[18] Irving, one of the wealthiest private corporations in the world is based in Canada. Verso closed its paper mill in Bucksport in 2014, the year after it received millions of dollars in biomass subsidies.[19]

• In 2013 and 2014, the latest years for which data are available, biomass plants received the proceeds from the sale of 92 to 96 percent of Maine's Class 1 Renewable Energy Certificates (RECs). The cost to Maine ratepayers totaled $21 million.[20] Biomass plants in Maine have also received millions of dollars over the years through sale of RECs in nearby states.

• According to a Republican legislator who served on the Energy, Utilities and Technology Committee, "since 1995, biomass plants have received more than $2.6 billion from Maine electric ratepayers, selling power for as much as 12.3 cents kwh when wholesale markets were under 5 cents. Of the $2.6 billion, $2 billion were above market rates."[21]

• In April 2016, the Maine Legislature passed and the governor signed an emergency $13.4 million taxpayer bailout aimed at keeping a couple of bioenergy plants running and some biomass jobs

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[15] Darren Fishell, Federal Gants boost Athens, Brunswick biomass plants, Bangor Daily News, October 26, 2015, http://bangordailynews.com/2015/10/26/business/federal-grants-boost-athens-brunswick-biomass-plants/; Katie Fletcher, Athens Energy new tax credit eligibility helps spur investments, Biomass magazine, July 23, 2014, http://biomassmagazine.com/articles/10696/athens-energy-new-tax-credit-eligibility-helps-spur-investments

[16] Efficiency Maine, Wood and Pellet Heating, http://www.efficiencymaine.com/renewable-energy/wood-and-pellet-heating/

[17] Mal Leary, Maine gets most federal biofuel help of any state. MPBN, Maine Public Radio, December 12, 2010. httpi/bangordaiivnewscom/2010/12/12Lpolitics/maine-gets-most-federal-biofuel-help-of-amtstate[?ref=reiatedBox

[18] Section 1603, Payments for Specified Renewable Energy Property in Lieu of Tax Credits Awardees as of October 1, 2015, https://docs.google.com/spreadsheets/d/18GULOCLnt_IEX2r6zo7fDsbS2DY_f6DAfEgy7GrJdJw/view#gid=739027284

[19] MarketWired, Verso Announces Closure of Bucksport, Maine Paper Mill, October 1, 2014, http://www.marketwired.com/press-release/verso-announces-closure-of-bucksport-maine-paper-mill-nyse-vrs-1952769.htm

[20] Maine Public Utilities Commission, Annual Report on New Renewable Resource Portfolio Requirement, Reports for 2013 and 2014 Activity, http://www.maine.gov/mpuc/legislative/archive/2014-2015ReportstoLegislature.shtml

[21] Beth O'Connor, The Good, Bad and Ugly on Maine Energy, The Maine Wire, April 25, 2016, http://www.themainewire.com/2016/04/good-bad-ugly-maine-energy/

going temporarily.[22] Biomass, it was argued, can help the Maine forest industry in light of the demise of pulpwood markets. But boosting biomass appears to be more about making money than salvaging jobs in a declining industry. At least one biomass company has invested heavily in the Maine Legislature. New York-based ReEnergy, which owns four bioenergy plants in Maine, donated nearly $12,000 to Maine legislative political action committees in the past five years, including over $7,500 in the past couple years alone. Meanwhile, the company testified that it was financially distressed. ReEnergy is a subsidiary of Riverstone Holdings LLC, a private equity firm that has raised $33 billion in capital.[23]

• In late June 2016, the U.S. Department of Commerce announced the establishment of "an integrated, multi-agency Economic Development Assessment Team to assist Maine's forest products industry....The goal of the EDAT will be to leverage the power of multiple federal government agencies and harness stakeholder input to create economic development strategies that help pave the way for job growth in rural Maine communities."[24] More than $4 million was committed "to help diversify and grow the Maine economy."[25] This amounts to more public subsidies to private companies in an effort to try rescue faltering Maine industries.

• Under the federal Advanced Biofuel Payment Program, three Maine pellet producers have received funding recently: Corinth Pellets $1,153, GF Funding $1652, and Maine Wood Pellet Co. $2,393.[26]

• A new Maine Born Global Challenge aims to "commercialize innovative technologies by providing physical locations and real projects for market expansion and value creation." The Challenge will cover a wide range of sectors, including biomass handling and storage.[27]

• Other federal programs also subsidize biomass plants, including Renewable Energy for America Program, New Markets Tax Credits, Woody Biomass Utilization Grants, and loopholes in the Clean Air Act.[28]

• Numerous other state programs are also available to subsidize biomass, including the Maine Municipal Bond Bank, Maine New Markets Tax Credit Program, Finance Authority of Maine's Seed Capital Tax Credit Program, PUC's Renewable Energy Pilot Program, the Maine Technology Institute's Renewable Energy Technology Fund, Small Enterprise Growth Fund.[29]

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[22] Andy O'Brien, LePage & Legislature Deliver $13.4 Million Bailout to Biomass Industry, Free Press, April 20, 2016, http://freepressonline.com/Content/Politics-Government/Eye-on-Augusta-Archives/Article/LePage-Legislature-Deliver-134-Million-Bailout-to-Biomass-Industry/96/778/45000

[23] Steve Mistler, Campaign Money Flows as Maine Energy Regulators Weigh Bids for Biomass Bailout, Maine Public, July 28, 2016, http://mainepublic.org/post/campaign-money-flows-maine-energy-regulators-weigh-bids-biomass-bailout#stream/0

[24] Maine Development Foundation, Maine Forest Economy EDAT Planning Committee, August 1, 2016, http://www.mdf.org/publications/Maine-Forest-Economy-EDAT-Planning-Committee/893/

[25] U.S. Economic Development Administration,, Economic Development Assessment Team to Deploy to Maine, August 1, 2016, https://www.eda.gov/news/blogs/2016/08/01/spotlight.htm

[26] USDA, Three Maine Biofuel Businesses Part of More Than $8 Million in Payments to Support the Production of Advanced Biofuel, September 20, 2016, https://www.rd.usda.gov/files/RD_AdvBiofuelsChart_2016.pdf

[27] Jim Lane, Be the Change: Maine's new Born global challenge, Biofuels Digest, November 28, 2016, http://www.biofuelsdigest.com/bdigest/2016/11/28/be-the-change-maines-new-born-global-challenge/

[28] Maine Governor's Energy Office, Energy Resources, http://www.maine.gov/energy/grants/energy-resources.html

[29] Maine Governor's Energy Office, Energy Resources, http://www.maine.gov/energy/grants/energy-resources.html

Economic and energy concerns of biomass

In theory, in Maine with its extensive forests, burning woody biomass to generate electricity or heat is enticing. Indeed, in 2015 a major portion of Maine's net electricity generation, 26%, came from biomass (wood and wood-derived fuels including black liquor from paper manufacturing).[30] However, in practice, there are several serious concerns with this from an economic and energy perspective.

First, bioenergy plants are not economically competitive in the market place at generating electricity. Biomass energy from stand-alone plants is almost always more expensive than that from other sources of electricity. Take for example Cate Street Capital's biomass plant in Berlin, New Hampshire, which draws fiber from Maine's wood basket. A long-term (20-year) contract with that biomass plant will cost ratepayers $125 million more than if they had purchased electric power on the open market.[31] The power that the plant produces is "usually way above market value."[32]

Bioenergy plants in Maine have been closing as global oil and natural gas prices have plummeted. Co-generation facilities associated with pulp and paper mills have shuttered, including Lincoln Paper & Tissue in Lincoln (2013), Great Northern in East Millinocket (2014), and Red Shield in Old Town (2015).[33] Citing low energy prices as the reason, a pair of Covanta stand-alone plants in Jonesboro and West Enfield stopped operating in May 2016 after they failed to meet new carbon reduction standards in Massachusetts. Four more Maine bioenergy plants reportedly are at risk because Connecticut plans to change its energy credits in 2018.[34] Trying to salvage some of these with more subsidies and laxer regulations skews the market toward less viable enterprises.

Second, as some legislators pointed out during the debate, the biomass bailout amounted to "corporate welfare" for out-of-state speculators. Rep. Beth O'Connor (R-Berwick) a member of the Maine Legislature's Energy, Utilities and Technology Committee wrote that biomass "cannot compete in today's energy market and likely will not be able to compete even 2 years out. The cost is expensive and the industry will continue to falter with natural gas and oil prices projected to stay low for the next 5 years....A carrot was dangled by JD Irving of a $100 million investment, but logic dictates to me that is unlikely to bear fruit. That investment counts on an overseas pellet market that is very well supplied, and again, with projections five years out for low prices on natural gas and oil, it will be difficult for Irving to lock in on those markets. Perhaps that is why they want to use our taxpayer money instead of their own, and also why Re-Energy, a company that is backed by River Stone Holdings, a $33 billion investment firm (Goldman Sachs) won't risk any more of their own money to 'sure up' biomass and protect loggers in Maine."[35]

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[30] U.S. Energy Information Administration, Maine Profile Analysis, June 16, 2016, https://www.eia.gov/state/analysis.cfm?sid=ME

[31] Chris Jensen, Berlin Biomass Plant Fully Operational, But At What Cost To Ratepayers? New Hampshire Public Radio. August 21, 2014, httgflnhpr.org[_post/berlin-biomass-plant-fully-operational-what-cost-ratepavers

[32] Dave Solomon, Bill aimed at resolving electric rate uncertainty clears key hurdle in House committee, 18~1, New Hampshire Union Leader. May 26, 2015, httgflwww.unionleadencom/ag@[pbcs.dll/article?AID=/20150526/NEWSO5/150529349#sthash.FPvlp1p8.dpuf

[33] RESTORE: The North Woods, Maine Pulp & Paper Mills, 1980-2016.

[34] Tom Bell, New Mass. Renewable energy standards impact biomass plants, Associated Press, April 7, 2016, http://www.seacoastonline.com/article/20160407/NEWS/160409346

[35] Beth O'Connor, The Good, Bad and Ugly on Maine Energy, The Maine Wire, April 25, 2016, http://www.themainewire.com/2016/04/good-bad-ugly-maine-energy/

Third, subsidizing large biomass companies undermines economic revitalization efforts that aim to produce high value-added, niche goods and services that can be produced with low carbon footprints.

Fourth, stand-alone bioenergy plants that generate electricity typically are only 20-25 percent efficient and they emit more carbon per megawatt hour generated than a coal plant.[36]

Fifth, at best only a small number of Maine logging jobs may be kept on life support briefly by the biomass bailout, and that does nothing to help those loggers prepare for life after the subsidies run out.

Public subsidies for bioenergy are not a cost-efficient, short-term expense of scarce public funds, they are not an effective long-term policy approach to investment in Maine's natural resource industries, and they are not an effective way to guide employment trends. As Gov. Paul LePage has pointed out, the picking winners and losers in the private sector by the State can be not only ineffective but also unfair.[37]

Forests and Climate

In addition to the economic and energy problems posed by burning biomass for power, there are serious concerns about the impacts on forest ecosystems and climate disruption.

As early as the 1980s when Maine state government was advocating bioenergy big time, voices were being raised about biomassing in the woods.[38]

Many studies demonstrate the claim is not supported that removing most "waste" material associated with logging operations promotes healthy forests. Treetops and other residues contain essential nutrients for forests growth.[39] Standing and down woody material also provides important habitat for terrestrial animals[40] and aquatic wildlife.[41]

Whole tree harvesting and intensive, even-aged management fragment forests, leave behind young, even-aged, simplified stands, reduce soil productivity and tree growth, and release CO_2 stored in soils and above ground biomass. Soils are hotter and drier. As streams warm, dissolved oxygen content is diminished.

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[36] Biomass Energy Resource Center, Biomass Energy: Efficiency, Scale, and Sustainability, http://www.biomasscenter.org/policy-statements/FSE-Policy.pdf

[37] Gov. Paul R. LePage, Tweet, December 17, 2015.

[38] Maine Audubon Society, Evaluation of Residual Stand Damage Following Partial Cutting in Northern Forest Types, June 1990.

[39] Klockow P.A., D'Amato A.W., Bradford J.B., Fraver S. Nutrient concentrations in coarse and fine woody debris of Populus tremuloides Michx.-dominated forests, northern Minnesota, USA, 2014, Silva Fennica vol. 48 no. 1' article id 962, httpsflprofile.usg§,gov/mvsclence/ubload folder/ci2014May2318005571597Klockow SilvaFennica 2014.pdf

[40] Maine Audubon Society, Wildlife Trees, Woody Debris, Retention Patches, and Biomass Harvests, 2008, https:[/forest.umaine.edu/files/2011/07/MAS Retention GuidelinesO8.pdf

[41] Restoring Brook Trout Habitat in Headwater Streams Using Large Woody Debris, http://www.na.fs.fed.us/stewardshlp/pubs/misc/restoring__brook_trout_habitat.pdf

In Maine, over three-quarters of the trees logged are chipped and/or burned. Instead of creating markets for wood that is burned or turned into short-lived products, we should be incentivizing for products that do not get burned, products that keep carbon isolated from the atmosphere for many decades.

America's forests play a critical role in addressing climate change, sequestering nearly 12 percent of total U.S. greenhouse gas emissions each year.[42] Forests are a vast reservoir of carbon, absorbing carbon dioxide from the atmosphere and storing massive amounts of carbon in trees, soils, and understory plants. However, the capacity of our forests to store carbon is diminishing due to development, agricultural conversion, and logging. Logging usually results in a loss of carbon from a forest, which can be as high as 60 percent if the forest is clearcut.[43] Converting a forest to wood products only partially offsets this release, because less than 20 percent of the average live tree is converted to wood products and fossil fuels release greenhouse gases in the logging, transportation, and manufacturing processes.[44] After a forest is clearcut, it remains an emitter of carbon dioxide for 15 years of more.[45] Even if the forest is allowed to grow back, it takes many decades, if not centuries, to recover the carbon that was lost.[46]

Though debate continues,[47] there is substantial evidence that burning biomass can be even more polluting than fossil fuels. In fact, burning wood emits as much as 50 percent more carbon dioxide per unit of useable energy than burning coal.[48] Data from the EPA show that in 2012 a bakers dozen Maine biomass plants emitted over 6 million tons of CO_2, along with 10,000 tons of SO_2, and nearly 5,000 tons of nitrogen oxides.[49]

Burning of biomass also emits many other pollutants, in addition to CO_2, SO_2, and NO_x,, including fine particulate matter, carbon monoxide, volatile organic compounds, and potential carcinogens (e.g., benzene and polycyclic aromatic hydrocarbons). Biomass burning emits more particulates,

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[42] Executive Office of the President, The President's Climate Action Plan, 2013, p. 11, http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf

[43] D.A. DellaSala, Why Forests Need to Be Enlisted in Climate Change Actions. Geos Institute. Ashland, OR, 2013, p. 2, http://www.conbio.org/images/content_policy/09.25.13-carbonprimer.pdf

[44] A. L. Ingerson, U.S. Forest Carbon and Climate Change: Controversies and Win-Win Policy Approaches, Washington, DC: The Wilderness Society, 2007, pp. 11-13, http://web.archive.org/web/*/http://wilderness.org/Library/Documents/upload/ForestCarbonReport.pdf; W. Nunery, W. and W.S. Keeton, Forest Carbon Storage in the Northeastern United States: Effects of Harvesting Frequency and Intensity Including Wood Products, Forest Ecology and Management, Volume 259, Issue 8, 31 March 2010, pp. 1363–1375, http://www.maforests.org/Keeton.pdf

[45] D.A. DellaSala, Why Forests Need to Be Enlisted in Climate Change Actions. Geos Institute. Ashland, OR, 2013, p. 2, http://www.conbio.org/images/content_policy/09.25.13-carbonprimer.pdf

[46] T. Walker (Ed), Manomet Center for Conservation Sciences, Massachusetts Biomass Sustainability and Carbon Policy Study: Report to the Commonwealth of Massachusetts Department of Energy Resources, Natural Capital Initiative Report NCI-2010- 03, Brunswick, Maine, 2010.

[47] Eduardo Porter, Next 'Renewable Energy': Burning Forests, if Senators Get their Way, New York Times, October 4, 2016, http://www.pfpi.net/wp-content/uploads/2016/10/EIA-biomass-effects-on-CPP-PFPI-Oct-2016.pdf; Sherry Huber, Opinion: See the Forest for the trees, and recognize benefits of biomass, Portland Press Herald, November 25, 2016, http://www.pressherald.com/2016/11/25/maine-voices-see-the-forest-through-the-trees-and-recognize-benefits-of-biomass/

[48] Partnership for Policy Integrity, Carbon emissions from burning biomass for energy, April 2011, http://www.pfpi.net/wp-content/uploads/2011/04/PFPI-biomass-carbon-accounting-overview_April.pdf

[49] Mary Booth, Partnership for Policy Integrity, Carbon and Forest Impacts of Biomass Energy, April 6, 2016, http://www.pfpi.net/wp-content/uploads/2016/04/PFPI-slides-for-4-6-2016-Markey-briefing.pdf

carbon monoxide, and polycyclic aromatic hydrocarbons than burning oil and gas.[50]

Despite its documented harmful impacts, Maine's United States Senators Susan Collins and Angus King, along with congressional colleagues, have introduced legislation to require the Environmental Protection Agency and other federal departments to endorse the discredited claim that forest biomass is carbon neutral.[51] More than five-dozen research scientists and practitioners who study energy, soils, forested and wetland ecosystems and climate change wrote in February 2016 urging the Senate to reconsider "the misrepresentation that forest bioenergy is carbon-neutral."[52] Despite the testimony of scientific experts, in April 2016 the Senate passed S.2012, which includes the Collins-King provision. In May 2016, the House passed the bill with some changes and sent it back to the Senate.[53]

The theory that, if you cut down a tree and burn it, another will grow in its place, and it will soak up the carbon you just burned is appealing. The problem is, it is wrong, at least relative to the near-term climate crisis.[54] Legislating that biomass burning is "carbon-neutral" is akin to trying to rewrite the law of gravity.

Conclusions and Recommendations

There is compelling evidence that biomass energy is not economically competitive, it is not silviculturally supportable, it is not carbon-neutral, it is not good for the climate, and it is not an efficient or effective use of scarce public funds.

The closure of non-competitive bioenergy facilities in Maine is causing people to lose their jobs in the plants and in the woods. However, creating more public subsidies is not the answer. That only enriches out-of-state investors, skews markets, promotes unhealthy forests, damages efforts to address accelerating climate change, and misallocates taxpayer monies.

The Maine Biomass Commission has articulated 16 recommendations based on five goals. All of the goals and recommendations assume that promoting and incentivizing more biomass logging and more bioenergy generation is good for Maine's economy, energy mix, and natural environment. That is not an accurate or fair assumption.

It is understandable that those in the forest industry want more public support for their business[55] and that legislators want to support loggers and others in the industry who are struggling.

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[50] State of Vermont, Comprehensive Energy Plan, 2016, p. 331, https:[/outside.vermontgov/sov/webservices/Shared%2ODocuments/2016CEP Final.Ddf

[51] Office of Susan Collins, Senator Collins Urges Colleagues to Support Tripartisan Biomass Amendment, February 2, 2016, http://www.collins.senate.gov/newsroom/senator-collins-urges-colleagues-support-tripartisan-biomass-amendment

[52] Woods Hole Research Center, Letter to the Senate on carbon neutrality of forest biomass, February 24, 2016, http://whrc.org/letter-to-the-senate-on-carbon-neutrality/

[53] S. 2012 — 114th Congress: North American Energy Security and Infrastructure Act of 2016, https://www.govtrack.us/congress/bills/114/s2012

[54] Bill McKibben, Burning trees for electricity is a bad idea, Grist, September 8, 2016, http://grist.org/climate-energy/burning-trees-for-electricity-is-a-bad-idea/?utm_medium=email&utm_source=edit-daily&utm_campaign=daily-static

[55] Patrick Strauch, Opinion: It makes sense to use Maine's forest biomass to produce energy, Portland Press Herald, February 29, 2016, 'http://www.pressherald.com/2016/02/29/maine-voices-it-makes-sense-to-use-maines-forest-biomass-to-produce-energy/

However, it is crucial that the Maine Legislature consider not just the interests of a particular industry or workers group but the broad public interest, that economic, environmental and energy costs as well as benefits of biomass be critically evaluated, and that the Legislature consider the long-term implications of promoting more biomass before creating more public subsidies or loosening environmental regulations.

A number of the Commission's recommendations are intended to encourage investments in combined heat and power systems and co-location to incentivize co-generation manufacturing growth. Other recommendations are aimed at promoting Maine's forest-related resources in-state and abroad, and at expanding biomass energy production and heating with biomass.

Before the State of Maine acts on those recommendations, we urge that the Legislature:

1. Undertake an open and transparent evaluation of the full costs and benefits of biomass logging, burning, and exporting on the state's economy, energy mix, forests and climate.

2. Commission a full accounting of the amount of carbon stored in Maine forestlands and the amount being lost annually through biomass logging activities.

3. Weigh the climate, habitat, recreational, and economic benefits and costs of preserving forests versus the benefits and costs of continued biomass logging of our forests.

4. Consider the financial, technical, and energy market risks of promoting combined heat and power systems.[56]

5. Revisit the allocation from regional carbon emissions auctions to ensure that payments are not inappropriately going to out-of-state investors who are not reinvesting in Maine.[57]

6. Seek input beyond resource production-oriented interests, including the expertise and insights of climate scientists, conservation biologists, recreation specialists, progressive economists, air quality experts, and other essential voices.

7. Adopt guidelines to promote sustainable biomass logging.

8. Ensure that scarce tax dollars are being invested efficiently and effectively and are not promoting logging our forests, grinding them into chips, and burning them for energy when science suggests that biomass burning can exacerbate climate disruption.

Thank you for the opportunity to provide these comments.

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[56] Paul Kellett, Report on Wood Biomass Combined Heat and Power, Irish Energy Center, 1999, http://www.seai.ie/Publications/Renewables_Publications_/Bioenergy/WoodfiredCHP9901.pdf

[57] Darren Fishell, Maine paper mills to get bulk of $3M in aid from carbon auction cash, Bangor Daily News, October 25, 2016, http://bangordailynews.com/2016/10/25/news/state/maine-paper-mills-to-get-bulk-of-3m-in-aid-from-carbon-auction-cash/

Schneider, Deirdre

From: Ernest Grolimund <egrolimund@msn.com>
Sent: Tuesday, December 06, 2016 2:39 PM
To: Schneider, Deirdre
Subject: Biomass pollution and health problems ignored by legislature and committee.

New safe dose for wood smoke pm2.5 ignored. 180 (mcg/m3),hr.

PM2.5 std ignored. Many biomass facilities only check to pm10 std allowing 150 mcg/m3 pm10 which contains 140 mcg/m3 pm2.5. Pm2.5 std of clean air act ignored still. Oversight problem of politicians. Violations of const rights to life, health, safety ignored.

No mention of climate change effects and mercury in fatty fish effects.

No mention of ave pm2.5 conc at 50 mcg/m3, twice pm2.5 design base value
of 25 mcg/m3 pm2.5. Range ignored up to 75 mcg/m3 at residential houses. Valleys and other locations above safe levels. No room for more pollution with more toxic wood smoke pm2.5.

General advice goes counter to ASCE recommendations to decrease all combustion energy sources. More energy should come from hydropower and wind and solar power and non combustion sources.

Emission factors of wood energy sources are higher than for non wood sources indicating more health and climate dangers.

Life and health are the first priority per judges over money and economics but economics only is considered and promoted.

Ethics problem created by ignoring recommendations of professions such as ASCE, ISACE, UNEP, WHO, EPA, Whitehouse CEQ. US Ethics Code violated.

Oaths of office violated. Life, health, safety not protected enough per new laws of science and or scientific findings.

More air pollution will hinder economic development per EPA studies. Result of recommendations will hinder Maines overall economy but help paper company profits and stove company profits.

Fraud by stove companies and biomass industry promoters ignored and not researched.
Products pollute and injure and are not safe or green and good for climate. Carbon neutrality myth accepted but should be denied by considering whole climate effects taking into account all pollution such as carbon black soot. Greenhouse gases and CO2 are not the only problem. IE pellet stoves emit 40 times more pm and thus create 10 times more climate change than oil and gas. Heat pumps and geothermal create no climate problems if sources are hydropower and wind and solar.

Moral problems identified by majority of churches who object in general to combustion energy pollution and climate change effects. See Green the Church group. Commandment to love or care for the garden earth ignored. Commandment to love or care for neighbours ignored. Greed evident in profit motive of companies

and desire for jobs and tax revenues over health and safety concerns. State taking eye off common problem of companies who ignore life and health and concentrate on profit only per fiduciary responsibility. Responsibility of state goes higher to check problems of greed as money is favored over const rights.

Corruption suspected from contributions to both parties by forest industry and business community in general. Pay for play problems said to be common in presidential election. People want the swamp of corruption drained. Victims of air pollution ignored. Like me and Am Lung Assn historic objections to any and all pollution.

Crimes need to be investigated. Willful blindness. Not enforcing laws. Criminal Negligence. Fraud. Not implementing DHHS Essential Services policy requiring believed health problems be prevented and stopped. Constitutional laws violated. Old, unsafe laws need to be amended not blindly followed.

Environmental benefits notation is a criminally false statement since most professions identify health and safety and environmental problems of many kinds. Study of problems mentioned by professions should be mentioned. Title implies benefits when professions specifically identify environmental and health and safety problems of many new kinds beyond politicians ability to understand.

Entire picture and outlook for more biomass energy is extremely controversial.

Cancer hotspots near paper plants ignored incorrectly. IE Sappi cancer hotspot in Hinkley.

General history is one of politicians missing poll;ution problems and being forced to change standards repeatedly from pm10 std of 150 mcg/m3 to pm2.5 std of 75 mcg/m3, then 65, and now 35 when the UNEP recommends 25 mcg/m3. More safety factors needed. None given.

Sincerely affirmed as if in court,

Ernest Grolimund, retired engineer, BS CE, genius IQ, energy and wood smoke air pollution expert per EPA Inspector General Office. Governors commendations for work leading to Maine and federal rules, regs and laws pertaining to small, medium and large biomass energy sources.

APPENDIX E

Goals and Recommendations Table

Goals	Recommendations
1. Encourage investment in biomass facilities and promote greater efficiency.	1.1. Amend the renewable portfolio standards by creating a thermal class to incentivize increased efficient biomass use for thermal.
	1.2. Amend the renewable portfolio standards to explicitly extend new renewable capacity resource portfolio requirements beyond 2017.
	1.3. Create an addition under the renewable portfolio standards that provides incentives for facilities that create instate jobs and economic benefits.
2. Encourage investments in combined heat and power systems to promote efficiency.	2.1. See recommendation 1.1
	2.2. Offer incentives through Efficiency Maine Trust or other avenues to those converting to combined heat and power (CHP) systems.
	2.3. Incentivize schools and other public institutions to convert to CHP systems.
	2.4. Provide greater flexibility in the establishment of back-up and standby charges in order to alleviate the burden for large energy users who are seeking to use alternative systems to lower their energy costs and lessen their demand on the transmission system.
3. Enable and encourage co-location and other innovative projects utilizing behind-the-meter technologies to incentivize manufacturing growth and increase system reliability.	3.1. Amend existing laws to explicitly allow microgrids statewide.
	3.2. Amend existing law regarding permitting of electrical lines, including poles and other related structures in, upon, along, over, across or under a road, street or other public way for persons other than transmission and distribution utilities.
	3.3. Amend existing law, or encourage the Public Utilities Commission through rulemaking, to increase the cap on installed capacity of a jointly owned generating facility under "shared ownership" net energy billing, as well as eliminate the cap of 10 accounts or meters for net energy billing.
4. Promote and develop Maine's forest-related resources in-state and abroad, and take advantage of federal grant funding and other collaborative efforts to bolster the forest-based economy in Maine.	4.1. Review the federal Economic Development Assessment Team's final report on Maine's forest economy and a final report on biomass energy under the auspices of the Governor's Energy Office to avoid duplicative efforts and to take advantage of collaborative efforts to address Maine's issues with its forest-based economy.
	4.2. Encourage the Maine Forest Service to support efforts toward fostering growth and innovation across Maine's forest products industry, including full utilization of recently awarded grants from the U.S. Department of Agriculture (USDA) for a State Wood Energy Assistance Team and the "Strengthening and Expanding Maine Wood Markets" project.
	4.3. Establish a program similar to the "Get Real. Get Maine!" campaign to encourage the use of Maine wood energy among residents to heat their homes, businesses and public institutions and to promote local forest products locally, nationally and globally.

Goals	Recommendations
4. (Goal 4 continued)	4.4. Provide funding, through bonds and tax incentives, for research and development of new wood-based technologies and to get these new technologies from the incubator phase into the marketplace.
5. Create state policies that encourage biomass energy production and heating with biomass.	5.1. Through statutory changes, categorize biomass-derived carbon dioxide emissions as carbon neutral and exempt from regulation under certain air pollution laws.
	5.2. Encourage the Governor's Energy Office to make biomass a more focused, greater priority in Maine's Comprehensive Energy Plan.