Biomass Energy Development Working Group
Final Report
January __, 2012

Pursuant to No. 37 of the Acts of the 2009 Session

Legislative Council
State House
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Biomass Energy Development Working Group
Final Report

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### Biomass Energy Development Working Group

**Members**

- **One member of the House of Representatives**

- **One member of the Senate**
  - Sen. Ginny Lyons

- **The secretary of natural resources or designee**

- **The commissioner of public service or designee**
  - Kelly Launder (2009); George Nagle (2011)

- **A representative of the biomass energy resource center**
  - Chris Recchia (2009-2010); Adam Sherman (2011)

- **Two representatives of the forest products industry**
  - Rocky Bunnell, Paul Cate

- **Two representatives of natural resources or environmental organizations**
  - Jamey Fidel, Robert Turner

- **Two representatives of an industry or utility that produces electricity or heat from biomass**
  - Peter Condaxis (2009-2010); Chris Brooks (2011), Bill Kropelin

- **A representative of the Vermont woodlands association**
  - Sam Miller

- **A representative of a university or college with a focus on biomass**
  - Bill Keeton

- **A representative of the consulting foresters association**
  - Ben Machin (2009-2010); currently vacant

- **A representative of the forest guild**
  - Ehrhard Frost
Biomass Energy Development Working Group Charge

No. 37 of the Acts of the 2009 Session

Sec. 1. BIOMASS ENERGY DEVELOPMENT WORKING GROUP

(a) The biomass energy development working group is established to enhance the growth and development of Vermont’s biomass industry while also maintaining forest health. In order to meet these goals, the working group shall analyze current issues in the biomass industry in order to develop a coherent body of recommendations. These recommendations may include incentives, harvesting guidelines, and procurement standards for the development and operation of biomass energy in the state of Vermont. The working group shall also include the following members:

(1) One member of the house, appointed by the speaker of the house;
(2) One member of the senate, appointed by the committee on committees;
(3) The secretary of natural resources or his or her designee;
(4) The commissioner of the department of public service or his or her designee;
(5) A representative of the biomass energy resource center, appointed by the committee on committees;
(6) Two representatives of the forest products industry that represent logging, processing, or wholesale operator interests, one appointed by the committee on committees and the other appointed by the speaker of the house;
(7) Two representatives of natural resources or environmental organizations that represent wildlife and biodiversity and forest health and sustainability interests, one appointed by the committee on committees and the other appointed by the speaker of the house;
(8) Two representatives of an industry, organization, utility, or corporation that either produces electricity or heat from biomass or purchases power from biomass, appointed by the governor.
(9) A representative of the Vermont woodlands association appointed by the governor;
(10) A representative of a university or college with a focus on biomass policy or research appointed by the speaker of the house;
(11) A representative of the consulting foresters association of Vermont appointed by the governor; and
(12) A representative of the forest guild appointed by the speaker of the house.

(b) The working group is authorized to operate for a maximum of three years in order to review the adequacy of its initial recommendations, continue research and analysis, and make additional recommendations to the legislature. The working group is authorized to hold four meetings each year during the interim between sessions of the general assembly. The working group shall elect co-chairs at its initial
meeting, and one of the co-chairs shall be a member of the general assembly. For attendance at a meeting when the general assembly is not in session, legislative members of the commission shall be entitled to the same per diem compensation and reimbursement for actual and necessary expenses as provided members of standing committees under 2 V.S.A. § 406.

(c) The working group shall issue interim reports to the house and senate committees on agriculture and on natural resources and energy on or before November 15 of 2009 and 2010. The reports shall include:

(1) recommended fiscal and regulatory incentives for the promotion of efficient and sustainable uses of local biomass for energy production and opportunities for offering more predictability in the permitting process;

(2) recommended guidelines or standards for maintaining forest health, including model harvesting and silvicultural guidelines for retaining dead wood and coarse woody material; maintaining soil productivity, wildlife, and biodiversity and other indicators of forest health; and wood procurement standards. In reviewing and recommending standards for biomass procurement, the working group shall review whether:

(A) separate procurement standards are necessary for certain consumers of biomass, such as retail electricity;

(B) there are obstacles or policy considerations that need to be overcome to establish model procurement standards for biomass energy facilities;

(C) a uniform procurement standard for maintaining forest health would offer more predictability in the permitting process;

(D) procurement standards can be designed to effectively monitor whether the collective demand for energy produced from biomass does not impair long-term site productivity and forest health;

(E) it is feasible to coordinate with adjoining states to develop a regional procurement standard for biomass energy facilities.

(F) biomass procurement standards should require third-party certification; and

(G) a standard should be developed that would require biomass electricity generating facilities to provide for a fuel efficiency of at least 50 percent over the course of a full year.

(3) Recommend standards and policies for the design of new renewable energy from biomass that are designed to promote sustainable, efficient, local, and fair use of biomass supplies.

(4) Recommend additional research and analysis that is needed to ensure that forest health is maintained while providing for a sustainable, long-term supply of local biomass for the production of energy and forest products.
(d) On or before November 15, 2011, the working group shall submit to the house and senate committees on agriculture and on natural resources and energy a final report addressing the issues in subdivisions (c)(1)–(4) of this section.

(e) Prior to reporting to the general assembly under subsections (c) and (d) of this section, the working group shall allow for public review and comment of any proposed recommendations for incentives, guidelines, or standards for the development and operation of biomass energy. At a minimum, the working group shall allow the department of forests, parks and recreation; the department of fish and wildlife; the public service board; the agency of agriculture, food, and markets; the Vermont economic development authority; and the department of public service to review and offer comments on any proposed recommendations for incentives, guidelines, or standards. In addition, the working group should coordinate with the Forest Roundtable to hold a minimum of two meetings to collect stakeholder input and gather expert testimony on the issues included in this section.

(f) The working group shall seek funding from available funding sources to hire consultants and conduct research and analysis related to the issues included in this section. In no event shall the working group seek more than $200,000.00 under this subsection. Funding acquired by the working group shall be administered by the office of legislative council.

(g) As used in this section, “biomass” means material from trees, woody plants, or grasses, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, farm, rangeland, or wildland-urban environment that is the product of forest management, land clearing, ecosystem restoration, or hazardous fuel reduction treatment.

(h) Legislative council shall provide legal and administrative services to the working group. The department of forests, parks and recreation shall provide technical and economic advice to the working group.
I. Overview

No. 37 of the Acts of the 2009 Session of the Vermont General Assembly (Act 37) established a Biomass Energy Development Working Group (the Working Group) that would meet over the course of three years to address how to enhance the growth and development of the Vermont woody biomass industry while also maintaining forest health. Under its charge, the Working Group is to issue two interim reports and one final report to the Vermont General Assembly. The Working Group issued interim reports in January 2010 and January 2011. This document is the final report of the Working Group.

The Working Group met 27 times, including two public hearings, to fulfill the statutory charge of Act 37 of the 2009 Session. Section 1(c) of Act 37 requires the reports of the Working Group to address the following four issues related to the promotion, development, and health of Vermont’s woody biomass industry and the forests of the state:

- 1(c)(1): Recommended fiscal and regulatory incentives for the promotion of efficient and sustainable uses of local biomass for energy production and opportunities for offering more predictability in the permitting process.
- 1(c)(2): Recommended guidelines for maintaining forest health, including model harvesting and silvicultural guidelines for retaining dead wood and coarse wood material; maintaining soil productivity, wildlife, and biodiversity, and other indicators of forest health; and wood procurement standards.
- 1(c)(3): Recommended standards and policies for the design of new renewable energy from biomass that are designed to promote sustainable, efficient, local, and fair use of biomass supplies.
- 1(c)(4): Recommended additional research and analysis that is needed to ensure that forest health is maintained while providing for sustainable, long-term supply of local biomass for the production of energy and forest products.

In 2009, the Working Group formed three subcommittees to address the four issues that the Vermont General Assembly required under Act 37 to be included in each report of the Biomass Energy Development Working Group. The Working Group charged a Biomass Enhancement and Development Subcommittee

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2 The minutes of each meeting of the Biomass Energy Development Working Group are attached in Appendix B of the hard copy of this report. The minutes may also be accessed electronically at the Working Group’s website.
3 Act No. 37, 2009 Sess., § 1(c).
with addressing Sections 1(c)(1) (recommended fiscal and regulatory incentives for the promotion of efficient and sustainable uses) and (3) (recommended standards and policies for the design of new renewable energy from biomass). The Working Group formed the Forest Health Subcommittee to focus on Section 1(c)(2), (recommended guidelines for maintaining forest health and for wood procurement standards). The Funding Subcommittee was formed to address issues related to Section 1(c)(4) (recommended additional research and analysis that is needed to ensure that forest health is maintained while providing for a sustainable, long-term supply of local biomass for the production of energy and forest products). In completion of its charge, the Funding Subcommittee focused on revisions and improvements to the Biomass Energy Resource Center (BERC) 2007 Vermont Wood Fuel Supply Model. As a result, the Working Group renamed this committee the Modeling Subcommittee.

Section II includes subcommittee proposals adopted and approved by the Working Group as a whole as recommendations of the Working Group. The Appendices include a draft Recommended Guidelines for Maintaining Water Quality, Soil Productivity, and Biological Diversity on harvesting jobs in Vermont; a list of forest health monitoring activities in the state; and the minutes of the meetings of the Working Group.

It is worth emphasizing that the Working Group’s charge pertains to woody biomass, that is, material from trees, or woody plants, including limbs, tops, needles, leaves, and other woody parts. The Working Group acknowledges that other forms of biomass hold promise as sources of energy; however, this report is limited to the scope of the Working Group’s charge. Unless the context clearly indicates otherwise, references in this report to “biomass,” with or without the word “woody,” should be read to mean woody biomass. The Working Group recognizes the value of agriculturally based bio-energy and biofuels as a significant part of Vermont’s energy and working landscape but does not possess the expertise to adequately consider this topic.

II. Working Group Findings

The Working Group formally voted to approve the following recommendations, standards, or guidelines.

A. Modeling Subcommittee

1. Recommended Additional Research and Analysis to Ensure that Forest Health is Maintained while Providing for Sustainable, Long-Term Supply of Local Biomass for the Production of Energy and Forest Products.

i. Background
Central to the issue of biomass development is the question of the capacity of the forest to provide feedstock. Over the last 50 years, the state of Vermont has consistently grown more wood volume than has been removed, and consequently, volume in the state’s forests has been increasing. However, the calculation of “available” supply from this inventory is not simple. Harvest levels for all wood products fluctuate with market demand and price. Rates of forest growth and mortality are neither constant nor linear. The land base itself may gain or lose forest over time. Parcel size and configuration can impact supply, as can the attitudes of landowners with respect to harvesting. All of these things contribute to uncertainty and risk in the prediction of available supply for policy makers, regulators, and developers.

Averaged over the last 10 years, roughly 1.2 million green tons of high-valued products (saw logs and veneer) and 1.5 million green tons of lower-quality wood have been harvested each year. Residential firewood and pulp-quality wood are the major components of the low-quality category, and with increases in fuel oil prices and the closing of pulp mills in New Hampshire, firewood now accounts for one-half or more of the lower-quality harvest volume. To further put these numbers in perspective, the McNeil Generating Station in Burlington and the Ryegate Power Plant combined consume roughly 435,000 green tons of harvested chips, with less than one-half of that amount estimated to come from within Vermont. Various recently proposed wood pellet plants typically demand 200,000 green tons per plant. A currently proposed combination electrical-generation and pellet plant would, if permitted and constructed, demand over 500,000 tons per year. Our inventory of volume in our forests may be growing, but it is not inexhaustible. Yet, adding up these numbers can be misleading. Historically, many more plants are proposed than ever get built. Moreover, new demand does not necessarily or immediately create new, additional harvested wood from the forest. Prices for low quality wood are still generally below levels that will motivate landowners to harvest this product alone, without also harvesting the more valuable sawlog products. Furthermore, low quality wood can often satisfy demand for a range of different products. Some of what is now sold as firewood or pulp could easily be diverted to competing uses. Finally, not all of a new plant’s supply will necessarily come from within Vermont—imported wood from adjacent states is likely.

The reader should draw the following points from this discussion. Under any development scenario, the supply of the woody biomass is influenced by physical, cultural, and economic factors. Promoting “efficient and sustainable” use, as called for in Act No. 37, requires that these factors influencing available supply be explored and understood. The sustainable supply question is highly complex, and no public interest is served by simple answers to complex questions.
In 2009, the Working Group voted to encourage the revision of the Biomass Energy Resource Center (BERC) 2007 Vermont Wood Fuel Supply Model. The BERC Wood Fuel Supply Model was developed in 2007 based on the most current U.S. Forest Service (USFS) Forest Inventory and Analysis (FIA) data available, which were from 1997. New FIA data were issued in 2010, and the working group concluded that revision of the Wood Fuel Supply Model to reflect the more current data would be prudent and would be a valuable tool for evaluating opportunities for harvesting and biomass energy production in Vermont. The Vermont Department of Forests, Parks and Recreation (DFPR) subsequently obtained funds and contracted with BERC to update the wood supply model using the new FIA data.

BERC integrated the new FIA data into the wood supply model and issued a final report in 2010 detailing the updated findings. BERC completed the wood supply model in three “runs”—conservative, moderate, and intensive. The moderate run was intended to serve as the best representation of reality, while the conservative and intensive scenarios depict the respective lower and upper limits of the model. These scenarios indicated the following availability of “net available” low-grade wood grown annually in Vermont that would be appropriate for use as biomass fuel above and beyond current levels of harvesting: (a) conservative scenario – 246,800 green tons; (b) moderate scenario – 894,900 green tons; and (c) intensive scenario – 1,940,700 green tons.

The Working Group utilized the moderate scenario of the wood supply model. The moderate scenario makes a variety of assumptions about the extent of the available land base, the impacts of physical constraints (slope, elevation, access, etc.), the inclination of the landowner toward harvesting, and other factors. The BERC wood supply model focuses on the yield of woody forest biomass under current forest conditions and management. The moderate scenario of the model indicates that there is slightly over 900,000 green tons of surplus low-grade wood grown annually in Vermont that could be used to advance woody biomass energy in the state. The model does not incorporate a move toward more intensive silvicultural practices, plantation type silviculture, dedicated energy crops, or any agricultural biomass. BERC’s full report updating the wood supply model is available at [http://www.biomasscenter.org/index.php/resources/publications.html](http://www.biomasscenter.org/index.php/resources/publications.html).

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4 Revisions to the BERC Wood Supply Model are due to methodological changes in how the U.S. Forest Service calculated the 2010 FIA forest inventory. The methodological changes are described in the BERC report available at [http://www.biomasscenter.org/index.php/resources/publications.html](http://www.biomasscenter.org/index.php/resources/publications.html).

iii. **Future Biomass Modeling Efforts**

Using the methodological framework of the BERC Vermont wood fuel supply model, efforts are underway by the Northeastern State Foresters Association (NEFA) to build a project-based wood availability model that will address some of the shortcomings of the original BERC model. These revisions are expected to be available by the end of 2011. They will incorporate an improved interface, the ability to integrate current FIA data easily, an extended time frame for the analysis, and the ability to modify many of the key assumptions over time. This tool is not intended to be a comprehensive model of the forest resource. Instead, it is designed to help answer questions about wood supply availability in the face of specific new projects and new projected demand. As in the original BERC model, the biological (forest growth) component of this model will remain relatively simple. There is no distinction among forest species or types and the model does not accommodate a range of harvest products. It continues with a similar County-level resolution and reports on net available low-grade fiber, but will be expanded with additional reports, maps, and charts.

The BERC, project-level approach is a useful tool that can quickly provide insights into wood fuel availability using current data, with relatively little effort on the part of the user. However, it is recognized that many of the questions likely to service around a transition to woody biofuels are likely to be more complex. NEFA is also in the process of developing a more comprehensive analysis tool that will require more effort to use, but will yield a wider range of results and insights. In comparison to the BERC approach, where a range of assumptions about growth, availability, and harvest are applied to inventory, this more comprehensive model will incorporate forest type detail, management and harvest intensity options, growth based on historic forest-type performance, land-use change over time (and other availability factors), and multiple product assumptions. Instead of a simple linear calculation as in the BERC model, this model incorporates an iterative mechanism that “solves” for a supply-demand balance over defined markets. The model can be driven by demand, supply, or price considerations. The results allow users to examine inventory, growth response, and market impacts, along with projected harvest.

This second tool will be based on a model that has seen extensive use in the US south, especially for the examination of biomass expansion in that region. As part of the development, accommodations will be made for conditions represented in northeastern forests, including multi-aged stands and a predominance of partial harvesting regimes. The model is currently under development and will be available for use by the second quarter of 2012.

The initiative and funding for both of these efforts currently comes through the Northeastern State Foresters Association (NEFA). The state foresters from each of the four NEFA states (NY, VT, NH, ME)
are actively involved in the development of these tools and are anticipated to be the primary users. NEFA also has initiated, and expects to continue, a process that engages a range of stakeholders in the design and use of the models. Partly as a result of this team approach and engagement, it was decided to support the development of two different tools with different, but related purposes, users, and different audiences. It is anticipated that, as users become familiar with these tools, they will begin to deliver insights into many of the questions and concerns of both policy makers and the public.

iv.  **Monitoring**

Two primary considerations should guide the state’s approach to monitoring of woody biomass status and use. First, information should be collected that serves a distinct public purpose. Ideally, efforts directed at monitoring and data collection should serve *multiple* purposes. An example is the USFS Inventory and Analysis program. Data on the status of the forest resource can be used to assess forest health and forest stocks. It is used by many for many purposes, including state forest biologists and biomass project developers.

Second, monitoring efforts should be commensurate with the value of the information generated. For a period of time through the 1980s, an annual survey of chip harvesting operations was conducted by DFPR staff. While it provided valuable information about the number of chip harvesting operations and harvested area, it was discontinued as growth through this period began to stabilize.

The Working Group has reviewed a variety of monitoring efforts, public and private. We examined a range of programs and options to provide some context for the recommendations that follow. Appendix B includes a matrix of monitoring efforts in Vermont (the monitoring matrix). Appendix C includes a list and summary description of various verification and certification mechanisms within and outside of Vermont that are relevant to this monitoring discussion and to issues related to forest health.⁶

We conclude from our review that information at the state level appears adequate in the area of forest inventory. The use of county-level extractions from these state-level sources must consider the lower levels of reliability typically associated with these subsets, but in general, existing programs appear to meet the needs in terms of quality, extent, and frequency. In the area of harvest reporting, the state relies primarily on its annual survey of mills to provide consumption information. Other periodic investigations supplement this annual effort, including a recent survey on firewood consumption and use value appraisal program (UVA).

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reporting. In the event of an increase in intensive harvesting, the state could re-establish its annual survey of chip harvesting operations. Information at the county level may well become more important if large biomass operations are developed. Data available for regional and municipal planning is currently limited, though efforts to digitize UVA records should help to fill this void.

In contrast, information pertaining to sustainable forest management and on-the-ground practices is limited at the state level. In 1990, DFPR completed a harvesting impact study in response to a particular increase in biomass harvesting following on the oil crisis of the 1970s and a substantial increase in wood fuel consumption both by industrial and residential users. Such a study has not been performed in the ensuing 21 years. While multiple sources currently exist, they are difficult to aggregate due to a lack of consistency across monitoring programs, which may include first-, second- or third-party verification, b) the voluntary compliance nature of many of these programs, and c) possible issues of information propriety. It is likely this area of monitoring will continue to be disorganized for some time to come, yet there is growing interest on the part of biomass consumers to document the source and impacts of their procurement. In addition, the Working Group understands that DFPR seeks to complete a further harvesting impact report in the near term.

We recognize the following needs. Basic information on harvest activity, collected repeatedly at intervals, is vitally important as a reference to assess impacts (if any) as levels of harvesting change. Information about levels, type, and impacts of harvesting can inform appropriate action and policy. This information can also serve to inform the public on the relative benefits and trade-offs of using biomass for fuel. In our opinion, the need for this information should be monitored by the legislature and specific research should continue to include a combination of regularly gathered data (such as FIA and UVA reporting) and periodic investigations (such as the recent Residential Fuel Assessment and the pending timber harvesting impacts study).

There is a specific need to examine the quality of FIA data, on which virtually all analyses of resource availability rely as the bedrock. These data are coming with greater frequency, but as the data collection, analysis, and reporting adapt to this new schedule, there is greater need to evaluate potential discrepancies or anomalies in the data. We should be sure this data is solid, even as the federal funding for this program is trimmed.

We also recognize that there are gaps in information that could inform policy, either directly or as inputs to modeling. In the forestry realm, these gaps appear more often in the economic sector than in the biological. For example, it is well established that our harvesting workforce is both shrinking and aging, yet

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the impacts of this on the ability of project developers to generate biomass supply is unknown. We also 
know little about the relative difference between the economic benefits produced by many smaller biomass 
facilities compared to fewer larger facilities. We hear about new projects, large and small, as they are 
proposed across the region, yet there is no comprehensive database that monitors the size or status of these projects.

Based on these considerations, we offer the following recommendations:

1. DFPR should complete a harvesting impact study similar to that completed in 1990. This study 
should help the legislature, state foresters, and the general public better understand baseline 
conditions pertaining to the types of harvesting, equipment used, and impacts to forest structure, 
wildlife, and water.
2. The legislature should ensure that funding continues to provide for DFPR staff to review and analyze 
ew new releases of FIA data.
3. Encourage research particularly on economic aspects of biomass harvesting. This research should 
target economic benefits and impacts for different scale projects; constraints to development, 
including financing and workforce issues; and the general responsiveness of the industry to increases 
in fossil fuel prices or increases in product demand as society moves towards a greater reliance on 
biomass for energy.
4. Given the diversity and extent of existing publically funded monitoring programs (see Appendix B), 
we recommend that a review of the coordination and execution of these programs be conducted. 
The monitoring matrix, perhaps expanded to incorporate more detail on each program, could serve to 
a) identify overlaps and gaps, b) review the adequacy of staff and funding, and c) examine how data 
are made available to the legislature and other policy or public groups for integration and analysis. 
Ideally, this review would include recommendations for improving existing programs and 
augmenting them in appropriate ways as the need and resources become available.
5. The state should continue to explore the potential of woody and non-woody agricultural biomass.

B. Enhancement and Development Subcommittee

The findings of the Working Group related to enhancement and development are set forth below under a 
discussion section followed by headings that reflect the statutory charge to the Working Group and a section 
on the use of roundwood.
1. Discussion

Successful enhancement and development of biomass energy use in Vermont is dependent on several factors. Foremost is ensuring the fuel supply promoted is appropriate in quantity and type such that its use is sustainable over time, indefinitely. While woody biomass is renewable, it is not inexhaustible. Priority must be afforded the ecosystem values Vermont holds for its forests, with an eye toward protecting all values – from habitat and biologic diversity to the visual landscape and recreation – and many in between, including water quality, soil conservation, climate mitigation, and air quality. Still, healthy forests that preserve and enhance these values in many cases may benefit from management, and in the process of accomplishing this management, biomass for energy may also be made available. Section C of this report, on forest health, identifies factors that should be addressed to provide this balance, and this section of the report discusses how the Working Group recommends Vermont go about making best use of the biomass made available through this management work.

Several facts are relevant to deciding where and how to enhance and develop the resource. The first is that Vermont forestlands are approximately 86 percent privately owned, and any plan must work to ensure that landowners want to and can retain their lands as working forests indefinitely, and the second is recognition that the Northeast in general and Vermont specifically is heavily dependent on oil for much of its energy needs, both in transportation and in building heat which makes this portion of the region’s energy profile most vulnerable and least secure. While use of biomass to create transportation fuel (cellulosic ethanol) is receiving a great deal of investment and attention from the U.S. Department of Energy, it remains in the developmental stage and would use a great amount of the resource for a relatively small portion of transportation fuel demand. The Working Group therefore does not believe that biomass for production of transportation fuels is a wise use of the wood resource, as even full commitment of biomass to this effort would do little to affect energy security and likely have a negligible effect on gasoline prices.

Considerations relevant to enhancement and development of woody biomass energy, and to awarding incentives for such development, include but are not limited to:

a. Efficiency and resource sustainability – the enhancement and development of the woody biomass energy industry in Vermont should attempt to use the available resource sustainably, in a manner that maximizes efficiency while meeting energy goals and focus on the four sectors of growth discussed below where the use of biomass can have beneficial localized impact on our energy reliability, security, and cost, and other public benefits.

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b. Job creation – both direct and indirect. Job creation would be a major driver of the local Vermont economy.

c. Property tax generation – the anticipated payment of property taxes should be a consideration when evaluating a proposed biomass business.

d. Development and maintenance of the Vermont timber harvesting infrastructure – providing market growth and stability is a necessary component to a healthy rural economy. It is particularly important to encourage young entrants into the industry.

e. Year-round demand for biomass wood – as the pulp industry fades, it is necessary to encourage businesses that can contribute to new market for low grade wood and replace fossil heating fuels.

f. Value added to products produced – the value of the end product should be considered in the evaluation process. A manufactured product may have more value than a raw commodity.

g. Factors affecting the environment and human health – emissions, forest health, water quality, waste disposal and by-products must be considered in the evaluation process.

h. The local economy – the expenditure and retention of dollars with the local and Vermont economy vs. payment for out-of-state fossil fuels should be factored into the evaluation.

i. Timber stand improvement and markets to use of diseased and damaged timber – timber stand owners need markets for diseased and damaged timber.

i. **Distributed Wood Pellet Manufacturing/Use**

According to the Vermont Residential Fuel Assessment for the 2007-2008 Heating Season, during that season, 2.8% of Vermont households (6,987) burned at least some wood pellets for space heating. In previous surveys, wood pellet usage was not significant enough to be reported.9 Currently Vermont has one facility that manufactures wood pellets10 and numerous distributors of wood pellets.11

There is potential for increased biomass use by the residential sector in the form of replacing home oil heating systems with wood pellet stoves, furnaces, and boilers. Driven by high fuel prices, the number of wood pellet stoves shipped from manufacturers increased by 161 percent nationally in 2008.12 According to

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the 2007-08 residential fuel assessment, approximately seven percent of Vermont households had installed or planned to install a new or used wood or pellet burning stove for the 2008-09 season. Though the average price of no. 2 fuel oil in Vermont went down from $4.13 per gallon in September 2008 to $2.31 per gallon in 2009, it has increased since then and was $3.57 per gallon in September 2011. Pellet systems remain a viable alternative for many residential and smaller commercial applications; the U.S. Energy Information Administration’s Heating Fuel Comparison calculator as updated in August 2011 estimates a cost per British thermal unit (Btu) for no. 2 fuel oil of $24.30 in comparison to $15.15 for wood pellets.

Wood pellet manufacturing would also provide an efficient year-round market for woody and potentially agricultural biomass. The appropriate number of new pellet plants is difficult to determine as the market for wood pellets will have to grow in kind, addressing the current “chicken or egg” situation. In Appendix E, the Working Group lists pros and cons of encouraging the use and manufacture of wood pellets in Vermont.

ii. Commercial/Industrial/Institutional Thermal and Thermal-led CHP

Presently Vermont contains numerous commercial, governmental, and industrial facilities that have use wood heat. According to the BERC database, these facilities include at least five state office complexes, 45 schools, three college campuses, one hospital, and several businesses. A major component of growth in the use of woody biomass for energy in Vermont will be the continued conversion by facilities that burn fossil fuels (typically oil and propane) to wood fuels (wood chips or wood pellets) in heating and cooling applications, and where appropriate, combined heat and power (CHP) systems. This growth should include increased use of district heating, particularly in Vermont downtowns. There have already been many successful conversions from oil to wood, particularly in: elementary/high schools, government offices, hospitals, industrial parks, and college campus facilities. Efforts are under way to demonstrate successfully municipal (district energy) applications in one or more communities in Vermont.

13 VRFA at 2.
15 These figures assume a price of $3.37 per gallon for no. 2 fuel oil and $250 per ton for wood pellets. This calculator is available at http://205.254.135.24/tools/faq/faq.cfm?id=8&t=5, retrieved Oct. 18, 2011.
17 See, e.g., BERC, Biomass Energy at Work: Case Studies of Community-Scale Systems in the US, Canada, and Europe at 3 (Barre, Vt elementary and middle school), 13 (Bristol, Vt, Mt. Abraham high school), 27 (Middlebury College) (Feb. 2010).
The Working Group has reviewed the advantages and disadvantages of commercial/industrial thermal and thermal led CHP. Advantages include the positive track record and financial benefits of these existing biomass conversions, which make the concept of wood energy more acceptable. This particular market to expand the use of woody biomass also fits three important criteria when considering public acceptance in Vermont: small, local, and sited in (or near) existing facilities. Appendix E includes a more complete list of the pros and cons of encouraging these areas of woody biomass energy.

iii. Electrical Generation

Vermont currently has two woody biomass electric generation facilities: Burlington’s 50 MW McNeil Generating Station, and the Ryegate 20 MW plant.\(^{19}\)

The Working Group has evaluated the potential addition of one large-scale (20–25 megawatt) wood-fired electrical generating facility, including whether such a facility should utilize excess heat in the form of CHP or other technologies to improve plant efficiency. The location of any such facility would need to be coordinated with Vermont’s utilities and VELCO to maximize balance for their systems.

Advantages of such a facility, if located in one of the southern four Vermont counties, would include providing a market for biomass fuel that is not seasonally restricted and “anchor” a wood supply network in the four southern Vermont counties. In addition, existing biomass suppliers in Windsor, Windham, Rutland, and Bennington Counties now must truck their wood chips to markets outside this area; a plant located in this region, one consideration would significantly shorten haul distances, making biomass production local and more economic, as well as reducing consumption of diesel fuel.

Potential disadvantages include the possibility that such a facility would affect other uses of the fuel supply.

Another potential disadvantage could arise from the currently low design system efficiency of an electric generation plant using woody biomass, particularly if the excess heat from the electricity production is not used for heating. Overall, the Working Group favors electrical generation using woody biomass that is part of a CHP project.

The Working Group address the question of design system efficiency further in Sec. B.3., below. Also, in Appendix E, the Working Group presents a more complete pros and cons of citing additional woody biomass generation in Vermont.

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iv. Agricultural-based bioenergy, including biofuels and methane digesters

The Working Group’s charge limits consideration to woody biomass but certainly growing of willow, poplar and other fast growing species specifically for thermal and electrical generation should be encouraged as a possible supplement or replacement for more expensive species, especially because there is so much fallow land available on which to produce these species and harvest with agricultural equipment.

2. Recommended Fiscal and Regulatory Incentives for the Promotion of Efficient and Sustainable Uses of Local Biomass for Energy Production and Opportunities for Offering More Predictability in the Permitting Process

Working Group recommendations on fiscal and regulatory incentives are set out immediately below.

The Working Group recommends that the legislature assign major priority to home heating with wood. In particular, tax policies advantageous to solar and wind projects should be extended to biomass consumers. Such tax advantages would be applied to the purchase of efficient heating stoves, furnaces, and boilers, and to district heating.

The Working Group also recommends that this wood home heating initiative be part of a larger undertaking to support thermal energy efficiency. State statute sets out ambitious goals for increasing building energy efficiency, reducing fossil fuel consumption, and increasing the use of renewable energy from Vermont’s farms and forests. At the current pace of effort, Vermont is likely to fall short of meeting its building efficiency goals and it is not clear that it will meet its goals for farm and forest renewable energy production. Funding will be needed to help achieve these goals. An example of a potential funding source would be a charge on residual BTUs, that is, a charge on energy inefficiency. Another example would be a tax on home heating fuels to support thermal efficiency programs to be implemented on a whole

20 10 V.S.A. § 580(a) provides that: “It is a goal of the state, by the year 2025, to produce 25 percent of the energy consumed within the state through the use of renewable energy sources, particularly from Vermont’s farms and forests.” 10 V.S.A. § 581 provides that:

It shall be goals of the state:

(1) To improve substantially the energy fitness of at least 20 percent of the state's housing stock by 2017 (more than 60,000 housing units), and 25 percent of the state's housing stock by 2020 (approximately 80,000 housing units).

(2) To reduce annual fuel needs and fuel bills by an average of 25 percent in the housing units served.

(3) To reduce total fossil fuel consumption across all buildings by an additional one-half percent each year, leading to a total reduction of six percent annually by 2017 and 10 percent annually by 2025.

(4) To save Vermont families and businesses a total of $1.5 billion on their fuel bills over the lifetimes of the improvements and measures installed between 2008 and 2017.

(5) To increase weatherization services to low income Vermonters by expanding the number of units weatherized, or the scope of services provided, or both, as revenue becomes available in the home weatherization assistance trust fund.


building basis. Some portion of the funds raised could support residential heating with efficient woody biomass appliances.

The Working Group further recommends that the state support the concept of new wood pellet manufacturing facilities in Vermont. Growth in residential pellet use will need to coincide with increased pellet production, which is difficult to predict (see above). Project developers should be provided with information and guidance regarding the state’s regulatory process.

To promote the expanded use of woody biomass in commercial/industrial/institutional thermal and thermal-led CHP applications, the Working Group recommends that the State of Vermont create an effective outreach program to inform potential candidates. Many locations have already been identified; however, a more complete list should be compiled. High-priority sites are locations where a thermal load uses extensive amounts of heating oil or propane. An analysis of existing programs and organizations that reach out to potential biomass users should be done. A comprehensive information package explaining biomass energy and highlighting successful wood conversion projects should be produced and made available to potential conversion sites. The package should also contain information regarding how to begin and negotiate the state regulatory process.

The Working Group also recommends that the General Assembly enact enabling legislation that allows municipalities to create and operate heating district utilities.

The Working Group further recommends that, as soon as feasible, the General Assembly lift the current suspension on applications for state aid for school construction at least for the purpose of supporting school conversions to woody biomass energy.

The Working Group recommends as well that the Clean Energy Development Board, in consultation with the Department of Public Service (DPS), develop recommended incentives for woody biomass thermal energy that use a tiered structure that rewards greater design system efficiency with a larger incentive in comparison to less efficient systems.

The Working Group favors the location of additional biomass energy-related manufacturing facilities in locations for which the combination of benefits and supporting resources is most appropriate, whether the manufactured product is pellets, electricity, or another biomass energy product. Location that would facilitate use of excess heating capacity should be encouraged.

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23 2007 Vt. Laws No. 52 § 36.
New construction to support woody biomass energy development, including pellet manufacturing or electricity generation, likely will require permits to be issued before construction can begin. Appendix D is a memorandum from legislative counsel on permit reviews that are relevant to biomass energy development. The centralization of services and permitting provided or required by the State would facilitate the industry significantly.

In addition, incentives should be developed to provide model approaches to issues that can add further delay to a project if not handled in an appropriate way, such as procurement standards, forest health issues, air quality requirements, and other issues that are important to the affected public.

With respect to biomass energy, woody biomass projects that produce electricity will be subject to Vermont’s “Section 248” permit process, which may take years from the initial application to project approval. As an example, Ryegate Power Station’s Section 248 process took 2½ years from the time of application to final permit approval.

When considering expansion of the biomass industry in Vermont, the Working Group recommends improvement of the Section 248 application process to increase predictability and reduce processing time. Such improvement could result from a comparison of the Section 248 process with other permit programs, with a focus on helping developers in the preparation of their project applications. For example, the Act 250 program has crafted an application form that includes detailed guidance for an applicant. While the Public Service Board (PSB) has issued an application form for net metering systems – which by law are of limited size\(^{24}\) – the PSB could and should create a form applicable to larger energy projects. The PSB also should consider the assignment of a person or persons who can assist the applicant in completing the application form in the same manner as Act 250 coordinators do today.

Enhancement of Vermont’s biomass industry should come in the form of incentives that maximize the benefits and minimize negative impacts. Such incentives could include tax credits, low-interest loans, favorable power rates, and renewable energy credits. Geographic location of pellet mills, chip processors, and power plants in Vermont have direct transportation implications that should be considered when tax or other incentives are offered.

3. **Recommended Standards and Policies for the Design of New Renewable Energy from Biomass That are Designed to Promote Sustainable, Efficient, Local, and Fair Use of Biomass Supplies**

\(^{24}\) 30 V.S.A. § 219a.
Working Group recommendations on standards and policies for design are set out immediately below.

The siting of new wood pellet manufacturing facilities should be dispersed among various areas around the state. Wood availability numbers and existing supply infrastructure will have to be considered before pursuing multiple sites.

In addition, the Working Group recommends that the General Assembly should require all pellets sold in Vermont to label their product as to moisture content, weight, list of ingredients, and suitability for various heating systems.

While commercial/industrial/institutional thermal load or thermal-led CHP systems are the most efficient use of biomass for energy generation, supplying this type of facility with biomass fuel is complicated by the seasonal nature of its operations because more wood is needed during colder months. This complication negatively affects biomass producers who need to keep their products moving year-round. The Working Group recommends that the state should support and enhance the biomass supply chain around Vermont, based on a business model under which suppliers provides woody biomass products to a variety of markets on a year-round basis. An example of such a business model is that of Lathrop Forest Products in Bristol VT, a successful wood fuel supply system.

The Working Group understands the need for CHP requirements. The Working Group also understands that the sustainable management of forests for products procured by an individual plant is key to forest health and sustainability. Such management can result in the use of renewable forest products in a way that maintains air quality, water quality, biodiversity, environment and economic health. Evidence indicates that a 50 percent system design efficiency level is attainable with some CHP systems, but is not possible in a stand-alone electric generating facility, given current technology. Every effort should be made to site and develop plants that make use of as much heat as possible. Regardless of location, any new plants should have a requirement to utilize thermal energy from the generation of electricity.

The Working Group did not evaluate research relating to the system design efficiency of woody biomass CHP as a standard relating to either the current Sustainability Priced Energy Enterprise Development (SPEED) program or a renewable portfolio standard should one be developed, except for the discussion below of the SPEED program’s standard offer RPS. CHP is recommended for all new electric generation plants using woody biomass. For incentives other than the standard offer, we recommend that the DPS or other appropriate develop a tiered or seasonal requirement for new biomass electric generators in the state.
The Working Group briefly discussed the design system efficiency requirement of “standard offer” program administered by the Public Service Board, under which up to 50 megawatts of renewable energy may contract for energy prices that are set to provide incentives for renewable energy development, and which requires that an eligible woody biomass project must have a design system efficiency of at least 50 percent. The group does not recommend changing that requirement. The standard offer is an incentive to encourage highest quality clean energy development. Any standard offer benefit should be given only to plants achieving the highest level (50 percent) system design efficiency.

On the issue of fuel efficiency, there is a distinction between incentive and regulatory programs. To date, many Vermont statutory requirements related to the fuel efficiency of woody biomass energy projects have come in the context of incentive and not regulatory programs. It is reasonable to condition the provision of these incentives on achieving a fuel efficiency standard that the market may not otherwise produce. In this regard, for incentive programs other than the standard offer, the Working Group recommends, as an alternative to a flat requirement of 50 percent for design system efficiency, that the DPS in consultation with the Clean Energy Development Board consider a tiered structure for incentives for woody biomass electric generation that would reward greater efficiency.

In contrast, given the interconnection of the regional power grid, establishing a regulatory fuel efficiency standard in Vermont may not be productive in the absence of a regional standard.

Accordingly, rather than requiring 50 percent fuel efficiency for all woody biomass energy projects, the Working Group recommends that the General Assembly direct that the PSB, in its Section 248 proceedings, require that each woody biomass energy facility be designed for the optimum fuel efficiency. Woody biomass energy projects that are not subject to Section 248 review should also be required to meet this standard if they are subject to other siting or land use proceedings such as Act 250 or local land use review.

4. Use of Roundwood

Wood heating appliances are a major source of heat for many Vermont homes. We recommend that the state develop incentives for the efficient use of wood for home heating by providing financial encouragement to replace old, inefficient wood-burning units with more efficient, cleaner burning appliances, the conversion to pellet-burning units or the installation of district heat.

25 30 V.S.A. § 8005(j).
We recommend that the state support policies which accommodate growth of the public’s use of low-grade roundwood for home heating, particularly from local sources. Such use would not only reduce Vermont’s reliance on imported energy, but also would promote job growth for local foresters, loggers, wood processors and truckers in rural areas of the state.

The growing use of roundwood must be balanced with educational outreach. It would be helpful for the public to have a list of wood suppliers who meet some indicator of sustainability training, perhaps logger education certificate holders. The public needs to be reminded that long-distance hauling of firewood can result in the unintentional spread of undesirable insects. The State, a landowner group or forest industry organization should develop a factsheet or website that describes firewood purchasing terms including the difference between “dry,” “seasoned,” and “green” firewood.

We recommend that the Agency of Natural Resources (ANR) enlist a panel of experts to provide guidance on actual field performance versus lab tests on wood-burning appliances as to emissions levels, particularly in view of the Environmental Protection Agency’s (EPA) recent decision to only require infrequent “tuning” of small boilers as opposed to numeric emissions limits. The Legislature should be aware of potential environmental and human health impacts of each class of biomass appliance

C. Forest Health Subcommittee

Act 37 requires the Working Group to include in its reports recommended guidelines for maintaining forest health and recommended wood procurement standards. develop these recommendations, the Working Group established the Forest Health Subcommittee.

The Working Group recognizes opportunities for biomass harvesting to maintain or improve forest health including adjusting stand density and improving stand quality through removal of low-grade stems. The Working Group also recognizes the variability in landowner objectives for their forestland and that harvesting guidelines and wood procurement standards are best considered in that context. The Working Group further recognizes that increasing demand for wood used for heat and electricity has the potential to put strains on forest resources, particularly if we do not encourage proper harvesting practices and wood procurement policies. Balancing opportunities for biomass harvesting with long term maintenance of forest health has been a primary objective of the Working Group. The Working Group also considered the issues of short-rotation woody crops as subjects of concern pertaining to forest health and also developed suggestions for education/outreach initiatives and monitoring activities to track impacts on forest health.
There is a discontinuity between the broad range of wood procurement practices mandated by the PSB for Vermont-based wood-fired electric producers through the Section 248 permit process, compared to the complete lack of forest resource protection required of other users of biomass. The Working Group acknowledges the desirability of PSB review and influence of harvesting practices conducted by electrical generators. There is an expectation that proposed generators would be subject to similar procurement standards including considerations for protection of forest health. The sub-committee referred to the harvest standards used by the City of Burlington Electric Department (BED) since 1984, which have worked well in the opinion of officials from the DFW, and agreed that there are a few ways in which the PSB standards could be improved in light of recent research findings. These include an expansion of identification and protection of certain biodiversity criteria and protection of soil nutrients. Such policies should be incorporated into a model procurement policy, which could serve as a template for new facilities that need to go through the permit process.

It is unclear whether Act 250 requires policies or conditions to address wood procurement for facilities triggering its jurisdiction. As discussed further below, the Working Group recommends that the Legislature create a uniform system for implementing wood procurement standards across a range of facilities, including electricity generators, district heating, combined power and heat, pellet manufacturers, schools and office building complexes that heat with wood.

The findings of the Working Group related to forest health are set forth below under headings that reflect the statutory charge to the Working Group on forest health guidelines and wood procurement standards, after which appear sections on carbon accounting, short-rotation woody crops, and recommendations for outreach, education, and monitoring related to forest health issues.

1. **Recommended Guidelines or Standards for Maintaining Forest Health, Including Model Harvesting and Silvicultural Guidelines for Retaining Dead Wood and Coarse Wood Material; Maintaining Soil Productivity, Wildlife, and Biodiversity, and Other Indicators of Forest Health**

Over the past 10 years, the traditional fossil-fuel based energy markets have fluctuated significantly. These fluctuations have led states, businesses, and individuals to reexamine their energy supplies. One potential energy supply is woody biomass, and Vermont is fortunate to have significant forest resources—with over 4.5 million acres of forest land. As a result, there has been significant interest in utilizing available woody

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biomass in Vermont for energy and thermal production for uses once supplied by fossil fuels. The potential for these new and expanded woody biomass markets has prompted questions and interest regarding the possible impacts that increased timber harvests and associated disturbances would have on long-term site productivity, water quality, and biological diversity. To fulfill the statutory charge and to address questions raised regarding the potential impacts of increased harvests, the Working Group reviewed whether harvesting guidelines would be appropriate for Vermont. In its review, the Working Group examined: existing guidelines in Vermont; how other states and jurisdictions have addressed concerns regarding increased harvests; and the available science and research. The Working Group also considered how and to what extent certain forest management practices such as protection of water quality, protection of biological diversity and maintenance of soil nutrients, are implemented during biomass harvesting.

Six other U.S. states\(^ {27} \) have developed guidelines specifically for woody biomass harvesting. Other states address water quality, soil productivity, and biological diversity in comprehensive forest practices acts or rules.\(^ {28} \) Additional states have adopted voluntary forest management practices that address water quality, soil productivity, and the retention of a variety of forest structures.\(^ {29} \) Similarly, the Canadian provinces of Nova Scotia, New Brunswick, and Quebec are in the process of developing biomass harvesting guidelines addressing similar issues.\(^ {30} \)

For over 30 years, Vermont has required its two wood-fired power plants to implement strategies to address public concern about forest health and other issues through procurement standards that require some review by the Vermont Department of Fish and Wildlife and professional foresters. DFPR has adopted Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont (AMPs),\(^ {31} \) and these practices, although not mandatory, have become an industry standard for timber harvests in Vermont.

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28 See, e.g. California Forest Practice Rules, 4 Cal. C.F.R. chs. 4, 4.5, and 10.


However, woody biomass retention standards do not currently exist for timber harvest operations in Vermont. The PSB’s influence over biomass harvesting does not extend to non-electrical producers (such as those producing heat) nor to biomass consumers located out-of-state. Moreover, neither the AMPs nor the procurement standards for wood-fired power plants address soil productivity or biological diversity on harvest sites.

Thus, a challenging question addressed by the Working Group is how to move other biomass users in Vermont that produce heat or pellets (schools, institutions, commercial biomass users and the State) in the direction of taking greater responsibility for the level of forest management practices associated with their wood fuel supply.

Our solution, in addition to a model wood procurement standard, is the development of voluntary harvesting guidelines that, if implemented, would protect important resources and could be adopted by responsible biomass users. The adoption of these guidelines by existing biomass users would help assure the public of adequate resource protection and also could increase the predictability of permitting for proposed biomass users. The Working Group encourages biomass producers and purchasers to employ guidelines that meet or surpass the recommended practices to minimize risks to ecological values.

The Working Group drafted a set of such guidelines which include many practices that are not unique to biomass harvests and therefore could be recommended for all wood harvests. Forest management issues addressed by the Working Group include: rare, threatened and endangered species, rare natural communities, old growth forests, deer wintering areas, low-nutrient sites, steep slopes, retention of woody debris, salvage harvesting, and monitoring. In addition to proposed and existing biomass harvesting guidelines and regulations from several states, the Working Group studied recently-released guidelines from the Forest Stewards Guild and drew upon these sources as well as experiences and opinions of representatives of the Vermont Department of Fish and Wildlife (DFW) and DFPR in the development of the voluntary guidelines. The guidelines are written so as to be general in view of conflicting research, flexible to accommodate a wide range of site conditions, and understandable by those charged with using them in the woods and easily implemented in the field.

Scientific support for provisions that address soil productivity and biodiversity is based on the concept that harvest residues and residual vegetation provide organic matter and nutrients that sustain productivity. Consistent and quantifiable data on the relationship between removals and residuals and the resulting inputs and outflows on forest soils is lacking, or at times conflicting. Scientific support for retaining forest structure such as snags, cavity trees and down material is based on research that evaluates the
role these elements provide for a variety of wildlife and ecological functions. While data may be limited in certain areas, there are studies to draw upon and forest managers should strive to implement the best science available and practice adaptive management as new science emerges.

The Recommended Guidelines for Maintaining Water Quality, Soil Productivity and Biological Diversity on Harvesting Jobs in Vermont are located in Appendix A of this report. The following three paragraphs summarize some of the issues addressed in the guidelines.

To protect water quality, the Working Group recommends implementation of DFPR’s Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont as necessary. Similarly, the Working Group recommends that landing size should be minimized to the extent possible and that, as is required under the AMPs, a functional buffer be maintained between lands and water resources.

To protect soil productivity, the Working Group recommends that leaf layer disturbance at a harvest site be minimized unless required for regeneration. Stumps and roots should be retained intact, except as necessary for road landing and trail construction. Tree tops should be utilized as necessary to increase equipment flotation. The proportion of retained organic debris should increase as harvest intensity increases or the cutting cycle decreases. Additionally, chipper waste should be returned to the forest on return skidder trips as practical and necessary.

To protect biological diversity, the Working Group recommends that a harvest operator retain as many snags, as safety, access, and landowner objectives permit. The Working Group recommends a minimum target for retained decaying trees and snags per harvest size. The group also recommends that down wood material be retained in place, and that incidental breakage on whole-tree harvests be retained in place as safety and aesthetics allow. In addition, a harvest operator should consider retaining newly cut material on site if large wood material is lacking. The Working Group also recommends that at least five percent of the stand be retained when performing salvage harvests unless such a practice would be contrary to state or federal government guidelines.

The Working Group also recommends that ANR develop a means for monitoring, including field data collection, a representative sample of harvest operations for wildlife tree and biomass retention levels, and review or amend the attached guidelines periodically as necessary and as funding allows. Monitoring could become part of on-going UVA inspections. Alternatively, the State could periodically review the need for reactivating and expanding the monitoring of biomass harvesting that was conducted in the 1980s and phased

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out due to a conclusion that the monitoring carried a high cost with low benefit. Also, the Sub-group 
*recommends* that DFPR periodically reassess the use and adequacy of AMPs on all types of wood harvests 
and strengthen them if warranted.

The Working Group further recognizes the desirability of regional biomass harvesting standards so as 
to allow Vermont-based facilities to compete fairly with facilities in neighboring states who buy wood in 
Vermont. The Working Group *recommends* that the state pursue the development and adoption of regional 
biomass harvesting standards even in light of the political difficulty associated with such an endeavor.

2. **Recommended Wood Procurement Standards**

Section 1(c)(2) of Act 37, in part, requires the Working Group to include in its reports recommend wood 
procurement standards. In reviewing and recommending standards for biomass procurement, Act 37 requires 
the working group to review whether:

(A) separate procurement standards are necessary for certain consumers of biomass, such as retail electricity;

(B) there are obstacles or policy considerations that need to be overcome to establish model procurement standards for biomass energy facilities;

(C) a uniform procurement standard for maintaining forest health would offer more predictability in the permitting process;

(D) procurement standards can be designed to effectively monitor whether the collective demand for energy produced from biomass does not impair long-term site productivity and forest health;

(E) it is feasible to coordinate with adjoining states to develop a regional procurement standard for biomass energy facilities;

(F) biomass procurement standards should require third-party certification; and

(G) a standard should be developed that would require biomass electricity generating facilities to provide for a fuel efficiency of at least 50 percent over the course of a full year.  

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*a. Discussion: Model Wood Procurement Standard*

Wood procurement standards are largely unique to each wood consumer, particularly as it applies to raw 
material specifications and delivery requirements. For example, a school may require frequent deliveries 
after hours of clean hardwood mill chips. A pellet manufacturer may require log-length softwood to 
supplement sawmill residue purchases. An electricity producer may be able to utilize all of the above plus

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chips made from forest residues. Many aspects of wood procurement standards do not affect forest health and will not be discussed here.

Accordingly, the Working Group has identified several attributes that should be included in a model wood procurement standard which would serve as a template for facilities going through the permitting process. The template would be adaptable for facilities seeking a Section 248 or Act 250 permit and, in order to incent the adoption of the standard, the Legislature could examine whether compliance with the model procurement standard leads to a presumption that an applicant has met its burden in addressing procurement issues related to forest health. Furthermore, rather than expanding the jurisdiction of Section 248 or Act 250, the Working Group recommends that a compliance system would need to accompany implementation and enforcement of procurement policies for facilities that do not require a Section 248 or Act 250 permit. For example, a compliance officer housed within ANR could oversee the implementation of wood procurement policies for school or district heating projects or wood pellet facilities not subject to Section 248 or Act 250 oversight.

The Working Group recommends that the following attributes be included in a wood procurement standard adaptable to all scales of biomass users except individual firewood procurement:

1. Harvesting guidelines. Adoption of the voluntary wood harvesting guidelines presented in Appendix A should be expected of wood suppliers selling wood directly from the forest to the consumer.

2. Verification of compliance with harvesting guidelines. Consumers should develop a means of verifying that harvesting guidelines are being used. The implementation of this objective will differ depending on the size (wood volume) of the consumer, and various examples of verification mechanisms are described in Appendix C to this report. Large users such as power plants should employ professional resource managers (foresters, ecologists, or wildlife biologists) to implement wood procurement plans including the monitoring of harvests. Small users could perform their own verification or buy wood through a broker or supplier contractually obligated to monitor harvests for compliance with the guidelines. Other options for assuring compliance with the guidelines could include buying wood from third party certified loggers or lands (SFI, FSC, PEFC\(^{34}\)), lands managed under the UVA program or only from harvests monitored by a professional forester, provided that these mechanisms incorporate the guidelines. Schools could economically secure the monitoring services they need by retaining a professional forester at the Supervisory District or Superintendents’ Association level.

3. Verification of land conversions. Consumers should have a means of verifying that land use conversions are genuine and not simply forest liquidation. For example, Vermont has a heavy cut law that requires a

\(^{34}\) These acronyms respectively stand for the Sustainable Forestry Initiative, the Forest Stewardship Council, and the Programme for Endorsement of Forest Certification Schemes. Please see Appendix C for more information.
permit for harvests that exceed 40 acres and result in low residual stocking. In addition, BED requires that landowners show evidence of the intent to use the converted land as proposed and have secured all necessary permits prior to harvesting.

4. Conformance with applicable laws. All wood consumers should insist on suppliers conducting their operations in conformance with pertinent laws and regulations.

5. Clear contracts. The Working Group recommends the use of a wood supply contract that clearly explains the responsibilities of the consumer and the supplier.

6. State natural resources review. Representatives of DFW should provide review and guidance on biodiversity criteria including wetlands, deer wintering areas, State Ranked S1 and S2 natural communities, and habitats of rare, threatened and endangered species when they appear on proposed harvest areas.

As mandated by the PSB’s certificates of public good (CPG) for the Ryegate and McNeil power stations, representatives of DFW currently provide the review and guidance discussed above on wetlands, deer wintering areas and habitats of rare, threatened and endangered species when they appear on proposed harvest areas. This review procedure should continue; however, the scope of review should expand to include State Ranked S1 and S2 natural communities.

The above procurement standards recommend expanding this procedure to facilities not subject to a PSB CPG. However, existing staffing levels at DFW are inadequate to absorb any significant increase in review responsibilities for new biomass users. The Working Group recommends the addition of up to two positions at ANR with backgrounds in wildlife biology, ecology, or forestry, located in the vicinity of wood procurement activities of any major new biomass demand for the purpose of providing consistent and timely review and guidance in the identification and protection of rare, threatened, endangered species, wetlands, deer wintering areas and rare natural communities. The subcommittee recognizes that state hiring limitations may preclude the addition of new staff at this time. Funding for staffing increases should be borne by resource consumers in the form of a fee assessed on wood consumption for all wood consumers procuring over 50 green tons per year.

b. Specific Criteria from Act 37

The Working Group reviewed the specific criteria from Act 37 on wood procurement standards and approved the following.

i. § 1(c)(2)(A): Whether separate procurement standards are necessary for certain consumers of biomass, such as retail electricity.
No, separate procurement standards are not necessary for certain consumers of biomass. Currently, the two biomass electric generating facilities at BED and Ryegate Power station are the only facilities subject to a procurement standard. The Working Group recommends development of a model uniform procurement standard for all forest product facilities as discussed above and under subsections (ii) and (iii) below.

ii. § 1(c)(2)(B): Whether there are obstacles or policy considerations that need to be overcome to establish model procurement standards for biomass energy facilities

Yes, obstacles and policy considerations do exist that must be addressed in establishing model procurement standards. For instance, there is significant support for development of a model procurement standard, but there are issues and obstacles to such adoption. There also is a debate on whether such standards should apply only to woody biomass harvests or to all harvests because the majority of the harvests are integrated, that is, simultaneously extracting a suite of products. In addition, the standards for procurement currently vary greatly from state to state across the region. Buyers and the market in general do not recognize state lines and are not limited to the procurement standards in any one state. Consequently, as discussed in subsection B(2)(v) below, the Working Group recommends that the state pursue a policy of regional coordination on a procurement standard.

iii. § 1(c)(2)(C): Whether a uniform procurement standard for maintaining forest health would offer more predictability in the permitting process

If a uniform procurement standard existed, it could provide predictability in the permitting process, but the permitting process or permitting standards for activities would need to be altered to incorporate a procurement standard. Biomass electric production in the state is currently the only activity subject to procurement standards as part of the PSB permitting process. If the pool of permits subject to standards was increased or if a land use permit, such as an Act 250 permit, required procurement standards, a good, quality procurement standard could assist in permitting predictability, and compliance with such a standard might be given deference by a regulatory or permitting authority.

iv. § 1(c)(2)(D): Whether procurement standards can be designed to effectively monitor whether the collective demand for energy produced from biomass does not impair long-term site productivity and forest health
No, procurement standards alone cannot be designed to effectively monitor whether demand for biomass energy does not impair site-productivity and forest health. Additional monitoring independent of demand for biomass energy and independent of harvests in general is necessary to adequately monitor forest health and productivity.

v. § 1(c)(2)(E): Whether it is feasible to coordinate with adjoining states to develop a regional procurement standard for biomass energy facilities

Yes, from the perspective of the Working Group, it is feasible and desirable to coordinate with adjoining states to develop regional procurement standards. Adoption of regional procurement standards would have substantial benefit for biomass energy facilities and forest resources. DFPR has pursued such regional coordination, most recently through the New England Governors’ Conference. However, the timing and implementation of a regional standard are difficult, and additional groundwork and negotiation are necessary before any foreseeable implementation.

vi. § 1(c)(2)(F): Whether biomass procurement standards should require third-party certification

No, if a procurement standard is established, the standard should not require third-party certification. However, the Working Group encourages land management and harvesting under the use value appraisal program, land conservation agreements, or third-party certification systems or subject to the advice and services of a professional forester, all of which could elevate the quality of forest practices and improve management of the state’s forest resources. Furthermore, some level of independent verification should be included in a model wood procurement standard as discussed above.

vii. § 1(c)(2)(G): Whether a standard should be developed that would require biomass electricity generating facilities to provide for a fuel efficiency of at least 50 percent over the course of a full year

No. Using forest resources in the most efficient way possible is desirable, but a standard of 50 percent fuel efficiency over the course of a full year may not be possible for certain biomass energy facilities in certain locations in the state. The Working Group does not want to discourage the location or operation of such facilities. The Working Group also recommends that the Public Service Board require each biomass energy facility to design for the optimum fuel efficiency. In addition, the discussion above in Sec. B.3 highlights the fuel efficiency standards currently incorporated in existing incentive programs. Consistently with this
discussion, the Working Group recommends that economic incentive programs for biomass energy development incorporate strong fuel efficiency standards.

3. Carbon Accounting

There are potential environmental benefits from forest management that results in maintaining or increasing carbon storage in the forest. Some forest landowners are seeking a financial return for carbon sequestration on their properties through participation in carbon markets. There are differing views on the appropriate methods and scale of accounting needed to understand the net greenhouse gas emissions associated with different forest management approaches. Views differ, in particular, with respect to the emissions consequences of so-called “substitution effects,” or replacing fossil fuels and non-wood building materials with wood derived energy and products.

An on-going debate in the scientific literature has to do with the impacts of expanding wood bioenergy use on greenhouse gas emissions. Some have proposed that a shift to greater reliance on wood biomass energy will significantly increase net greenhouse gas emissions over the near term of one to several decades, primarily because of the lower energy conversion efficiency of wood as compared to fossil fuels (Schesinger et al., 2010; Walker et al., 2010, McKechnie et al., 2011).

Others have argued the opposite, viewing wood energy as largely carbon neutral (Lippke et al. 2010; Lucier, 2010; Sedjo, 2011). In general, the disparity between these two views depends on the accounting assumptions made by researchers and modelers.

The crux of the debate comes down to whether or not there will be an initial increase in greenhouse gas emissions if more wood is used for bioenergy (a “debt”), particularly if it is harvested from growing trees, followed by a lag time until a net reduction in emissions is achieved (a “dividend”). Part of the ongoing discussion is how great the initial debt might be and how long a lag time we should expect until we gain the dividend (McKechnie et al. 2011). This question is important from a climate perspective because the near term could be a critical window for stabilizing atmospheric greenhouse gases, beyond which some scientists have suggested there may be irreversible disruption of the planet’s climate system (Solomon et al. 2009).

Assuming that there will be some degree of near term debt and thus a lag time until net emissions reductions are achieved, and recognizing that this assumption has been challenged (Lucier 2010), the amount of initial carbon flux and the time lag until carbon neutrality can be minimized by: 1) harvesting practices
that do not significantly intensify overall harvest rates or wood removals; 2) harvesting practices, such as stand improvement cutting, that improve forest health and growth; and 3) local, small scale energy applications with high conversion efficiencies. It follows that if minimizing carbon debt and lag time are an objective, then policy should promote high efficiency energy applications over lower efficiency applications.

Data from the USFS inventory and monitoring plots show that Vermont’s forests are increasing in standing inventory every year. In other words, the forest will continue to sequester carbon unless harvesting exceeds the annual net growth, tree mortality increases, or uptake rates decline. A carbon debt is less likely if the forest ecosystem has been maintained in equilibrium or has a growth-to-harvest ratio greater than 1:1. (Strauss 2011), though the science is still exploring this question. Also, the carbon stored in forest fuels is part of the earth’s carbon cycle. At some time, all unutilized trees will die, decay and emit carbon. However, though temporally dynamic dead wood represents an important carbon pool, containing about 10% of the carbon stored in Vermont’s forests. Therefore, maintaining a source for dead wood recruitment is an important consideration. Utilizing some of this material for fuel and lumber displaces the use of fossil carbon that could stay sequestered for centuries; a portion of harvested wood may be transferred to long term storage of carbon in stable wood products.

Because the scientific community has not come to a consensus on the net carbon fluxes and greenhouse gas emissions consequences of wood bioenergy, we recommend that the State closely follow the development of this issue, including ongoing research at ANR, and initiate a process to officially adopt greenhouse gas accounting protocols relevant to wood bioenergy.

4. **Short-rotation Woody Crops**

The Working Group discussed issues surrounding the culture of short-rotation woody crops (SRWCs). Although the establishment of such crops is not common at this time, the group feels that a potential exists for the expansion of these crops in view of subsidies for establishment and use of SRWCs through programs such as the Biomass Crop Assistance Program and recommended limits on collection of harvest residue biomass.

The Working Group developed the following list of concerns and recommends that they should be explored in more detail by the State of Vermont, researchers, or non-government.

1. Use of non-native species or clones in Vermont and risk of such plants becoming invasive.
2. Weed control; potential chemical impacts and mechanical alternatives.
3. Possible impacts of SRWCs on biodiversity.
4. Possible impacts of SRWCs on wildlife habitat.
5. Possible impacts of SRWCs on water quality.
7. Carbon flux due to conversion of farmland or former-farmland to SRWCs.
8. Economic impacts of converting productive farmland to fuel production.
9. Limitations to the use of SRWCs due to chip quality issues.
10. Potential greenhouse gas emissions related to the use of SRWCs.

Sources of additional information include, but are not limited to, Dr. Timothy Volk at SUNY College of Environmental Science and Forestry, Syracuse, NY and Mr. Jack Bryne of Middlebury College.

5. Summary of Outreach/Education/Monitoring

We recommend that the State of Vermont provide training opportunities for foresters, landowner, and loggers in the use of the state Geographic Information System (GIS) database to identify/protect biodiversity elements of the forest. We recommend that information on the state GIS database be enhanced to include a full description of species and community attributes, their location, and recommended protection and enhancement practices similar to existing management guidelines for deer wintering areas.

We recommend educational opportunities for foresters and loggers on the benefits and trade-offs on reducing tree utilization and increasing post-harvest woody debris. A simple means to estimate residue levels is needed for use in the field. The University of Vermont (UVM), the Forest Guild, the Vermont Woodlands Association and the Vermont Forest Products Association (VFPA) are potential providers.

Educational opportunities on forest practices should include public-private partnerships that sponsor seminars or conferences for loggers and other forest product users in various regions within the state.

A sustainable harvesting manual should be developed, similar to “Good Forestry in the Granite State,” to be used as a tool for increasing the awareness of landowners, foresters, and loggers of desirable practices. Possible sources are UVM, DFPR, or USFS.

We recommend that the state continue to monitor rates of forestland gain or loss, as well as the harvest and growth of timber including unutilized low quality wood. Monitoring tools include USFS Forest
Inventory and Analysis data, Vermont Wood Harvest Report, Vermont Fuel Wood Study as well as the BERC Wood Supply Model or other wood supply models.

We recommend that the state sample monitor harvest operations for residual woody biomass and wildlife tree retention as part of UVA inspections or by other cost-effective means.

We recommend that ANR determine if there is a need for, and if warranted resume, inspections of biomass harvests as done in the 1980’s as part of the portable sawmill law or by other appropriate means.

DFPR is currently reviewing the AMPs. We recommend that the state reassess the use and effectiveness of AMPs every 10 years.

We recommend that the state, the U.S. Natural Resources Conservation Service (NRCS) or UVM monitor the rate of establishment of short-rotation woody crops and every 10 years assess the need for voluntary or regulatory controls of the SRWC concerns listed above.

We recommend that the state or an industry group compile a list of sources of chunk firewood, along with possessing credentials of sustainable harvesting training, from whom the public and institutions could order sustainably-harvested wood. Suggested credentials include Logger Education to Advance Professionalism (LEAP) training \(^{35}\), or Master Logger Certification.

We recommend that the state, Renewable Energy Vermont or VFPA develop and distribute to the public information explaining the difference between “dry”, “seasoned” and “green” firewood.

We recommend that ANR compile and provide information to the legislature on emissions output under “field conditions” for wood-burning appliances that lack federal or state mandated numeric emissions levels in order to prioritize incentives or develop regulations.

We recommend that the state initiate a process, working with key stakeholders including the ANR, UVM, DPS, and others, to research and adopt greenhouse gas accounting protocols relevant to wood bioenergy. In this regard, ANR has begun efforts to evaluate life-cycle carbon accounting as it applies to biomass, and the Working Group supports integrated this endeavor into such a process.\(^{36}\)

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\(^{35}\) For more information on LEAP, go to [http://loggertraining.com/vt-leap.htm](http://loggertraining.com/vt-leap.htm), retrieved Oct. 25, 2011. The master’

Appendix A: Recommended Guidelines for Maintaining Water Quality, Soil Productivity & Biological Diversity on Harvesting Jobs in Vermont

The Vermont Biomass Energy Development Working Group developed the following guidelines to provide recommended practices on protecting soil productivity and biodiversity for all wood harvests in Vermont. The guidelines are general, flexible, understandable, and easily implemented in the field. These are recommended guidelines, not mandatory, for protecting Vermont’s forests and to ensure a sustainable flow of products.

1. Harvests should incorporate recognized silvicultural practices based on the stand conditions and landowner objectives. United States Forest Service Silvicultural Guides provide the kind of guidance needed; however, management should be adaptive to include new research findings, particularly in view of the varied nature of Vermont forests as a result of site conditions, past land use, prior management and future change (climate change and invasive species).

2. Harvest practices should take into account the existence and protection of rare, threatened and endangered species, State Ranked S1 and S2 natural communities, wetlands and deer wintering areas as shown on the State’s Geographic Information System (GIS). Foresters, loggers and landowners should seek guidance from the Vermont Agency of Natural Resources regarding the location of such resources and any management considerations that should be taken into account before harvesting commences.


4. Minimize landing size to the extent practicable for the scale of the operation.

5. Maintain a functioning buffer strip between harvesting operations and streams, wetlands, and other water bodies.

6. Harvesters should implement proper close-out procedures to be maintained by the landowner over time.

7. Minimize disturbance of the litter layer except as required for regeneration.

8. Retain stumps and roots intact except as necessary for road, trail and landing construction.

9. Use tree tops as necessary to increase equipment floatation and stabilize harvest trails.

10. Topwood equivalent to 20 percent of harvested tree tops should be left well-distributed on the harvest site in cuts removing one-third of the basal area or less. Topwood equivalent to 30 percent of harvested tree tops should be left well-distributed on the harvest site in heavier cuts (shelterwood and patches).

11. Retain additional organic matter or avoid whole tree harvesting on nutrient-impaired sites (steep, wet, shallow, or sandy soils).

12. Increase the proportion of retained organic debris when cuts are heavy or rotations short. This recommendation must be balanced against potential impacts of harvesting additional acres to offset reductions in utilization.

13. Recycle unutilized wood that accumulates on the landing by returning it to the harvest site on return skidder trips.
14. Retain as many snags as safety, access, and landowner objectives will permit. Refer to Table 1 below for target levels of retained structure.

15. Retain all pre-harvest down wood in place.

16. Retain breakage incidental to harvesting (broken branches, unutilized trees) within constraints of safety and aesthetics.

17. Retain some newly cut material on site if large woody debris is lacking.

18. Salvage harvesting should leave 5 to 15 percent of the affected stand area unharvested by retaining patches and individual trees that are alive, dead, or dying, unless contrary to state or federal guidelines.

19. Take appropriate precautions to identify the presence or threat of invasive plants as per the landowner or forester.

20. Use buffer strips, where practicable, to protect aesthetic qualities along major trail corridors and along public roads.

**TABLE 1: STRUCTURAL RETENTION STANDARDS FOR HARVESTING WOOD**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Minimum Target/Ac*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live decaying trees 12-18” DBH</td>
<td>4</td>
</tr>
<tr>
<td>Live decaying trees &gt; 18” DBH</td>
<td>1</td>
</tr>
<tr>
<td>Snags &gt;10” DBH</td>
<td>5</td>
</tr>
<tr>
<td>Cuts removing ≤ 1/3 basal area</td>
<td>Retention target: topwood equivalent to 20 percent of harvested tree tops</td>
</tr>
<tr>
<td>Cuts removing &gt; 1/3 basal area</td>
<td>Retention target: topwood equivalent to 30 percent of harvested tree tops</td>
</tr>
</tbody>
</table>

*Retain smaller trees when suitable trees of these size classes are not present. The highest priority must be safety, with specific regard to OSHA regulations.*
## Appendix B. Identified Forest Monitoring Activities in Vermont

<table>
<thead>
<tr>
<th>Monitoring Program</th>
<th>Date initiated</th>
<th>Frequency</th>
<th>Scale</th>
<th>Run By</th>
<th>Category</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIA</strong></td>
<td>1940s</td>
<td>5-7 yr cycle</td>
<td>Statewide</td>
<td></td>
<td>USFS</td>
<td></td>
</tr>
<tr>
<td><strong>VT Forest Health Monitoring</strong></td>
<td>5-7 yr cycle</td>
<td>Statewide</td>
<td></td>
<td>DFPR, USFS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VT Hardwood Health Survey</strong></td>
<td>1985</td>
<td>5-yr cycle</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td>Currently suspended</td>
</tr>
<tr>
<td><strong>North American Maple Project</strong></td>
<td>1988</td>
<td>annual</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td>Exclusively for sugar bush and maple product production</td>
</tr>
<tr>
<td><strong>Vermont Monitoring Cooperative</strong></td>
<td>1990</td>
<td>Various</td>
<td>Statewide</td>
<td></td>
<td>DFPR, UVM, GMNF</td>
<td>VMC performs long-term monitoring on two sites; also supports research by others</td>
</tr>
<tr>
<td><strong>Annual Aerial Surveys</strong></td>
<td>Annual</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td></td>
<td>Insect, disease</td>
</tr>
<tr>
<td><strong>Ground monitoring plots</strong></td>
<td>Annual</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td></td>
<td>Insect</td>
</tr>
<tr>
<td><strong>AMP Effectiveness review</strong></td>
<td>Annual</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td></td>
<td>Primary focus: Water Quality</td>
</tr>
<tr>
<td><strong>UVA inspections</strong></td>
<td>Periodic</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td></td>
<td>Forest management</td>
</tr>
<tr>
<td><strong>Long-term Soil carbon study</strong></td>
<td>2009</td>
<td>Annual; 40-yr term</td>
<td>Statewide</td>
<td>UVM</td>
<td></td>
<td>Carbon monitoring: 18 locations. Designed to show the impacts of management</td>
</tr>
<tr>
<td><strong>Chip harvester operations</strong></td>
<td>Annual, 1981-1990.</td>
<td>Statewide</td>
<td></td>
<td>DFPR</td>
<td></td>
<td>Discontinued in ???</td>
</tr>
<tr>
<td><strong>Harvesting Impacts Study</strong></td>
<td>1990; proposed for 2012</td>
<td>Statewide</td>
<td></td>
<td></td>
<td></td>
<td>Design similar to 1990 study funded and in process</td>
</tr>
<tr>
<td><strong>Mill consumption survey</strong></td>
<td>Annual</td>
<td>Statewide</td>
<td></td>
<td></td>
<td></td>
<td>Mill consumption is used to infer levels of harvesting</td>
</tr>
<tr>
<td><strong>Resident Fuel Assessment</strong></td>
<td>Periodic</td>
<td>Statewide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Sustainable Forest Management
<table>
<thead>
<tr>
<th>Private programs</th>
<th>Date initiated</th>
<th>Frequency</th>
<th>Scale</th>
<th>Run By</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BED/Ryegate procurement standards</td>
<td>1983?</td>
<td>Applies to all procurement</td>
<td>•</td>
<td>Utility</td>
<td>•</td>
</tr>
<tr>
<td>Landowner Certification</td>
<td>Annual</td>
<td>various</td>
<td>•</td>
<td>•</td>
<td>Certification; Landowner opts in Certified land base is growing slowly.</td>
</tr>
<tr>
<td>Certified Fiber Sourcing</td>
<td>By the job</td>
<td>SFI, FSC</td>
<td>•</td>
<td></td>
<td>Certification of plant or mill. These programs are relatively new.</td>
</tr>
<tr>
<td>Master Logger’s Certification</td>
<td>By the job</td>
<td></td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bio-e woody biomass retention guidelines</td>
<td>Proposed 2010</td>
<td>General management</td>
<td>•</td>
<td>n/a</td>
<td>Voluntary. Landowner opts in</td>
</tr>
<tr>
<td>Forest Guild Biomass Retention/Harvesting Guidelines for the Northeast</td>
<td>2010</td>
<td>General management</td>
<td>•</td>
<td>n/a</td>
<td>Voluntary. Landowner opts in</td>
</tr>
<tr>
<td>Vermont Family Forest Guidelines</td>
<td>2008</td>
<td>General management</td>
<td>•</td>
<td>n/a</td>
<td>Voluntary. Landowner opts in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Models or Designs</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlebury College Standards</td>
<td>Proposed 2009</td>
<td>Applies to all procurement</td>
<td>•</td>
<td>Biomass consumer</td>
<td>•</td>
</tr>
<tr>
<td>BERC/Harwood Procurement matrix</td>
<td>Proposed 2010</td>
<td>Applies to all procurement</td>
<td>•</td>
<td>Biomass consumer</td>
<td>•</td>
</tr>
</tbody>
</table>

*Sustainable Forest Management*
Appendix C: Procurement Standards – Verification and Certification
prepared by Aaron Adler, Legislative Counsel, Sep. 20, 2011

This document, created for the Vermont Biomass Energy Development Working Group, provides examples of verification mechanisms in order to inform the discussion of procurement standards for biomass energy projects. The document divides verification mechanisms into three categories: self-verification, second-party verification, and third-party verification, with examples in each category.

Self-verification

*Self-verification* means that a producer monitors and reports about its own harvesting or manufacturing process.¹ Conceptually, self-verification can simply be a declaration by a producer that a product meets a certain requirement, with the producer responsible for verifying compliance. Self-verification also may be accompanied by additional outputs. These outputs might include reports on sustainability, emissions, resource use, or other indicators.²

Examples of self-verification exist both in and outside of forest-based industries:

- The Vermont Public Service Board’s net metering application requires the applicant for approval of net metered renewable electric generation to self-certify compliance with various requirements, with penalties available for false or misleading certifications.³
- For potable water supply and wastewater system permits, Vermont law uses certifications by a licensed designer that the system design and installation meet applicable requirements. Penalties and remediation requirements may be imposed for certifications that are untrue or incorrect or designs or installations that do not comply with the applicable rules.⁴
- The European Union’s “Green Public Procurement” product sheet for government purchases of copying and graphic paper allows for acceptance of a producer’s “technical dossier” to show compliance with the suggested paper procurement criteria.⁵
- The Swedish Environmental Management Council’s basic requirements for procurement of renewable electricity (including biomass power) allow the use of self-declarations or company certifications in initial procurement stages such as a market analysis that precedes a contract negotiation, if followed by an investigation to determine which

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¹ World Resources Institute (WRI), *Sustainable Procurement of Wood and Paper-based Products* (Sustainable Procurement) at 2.11 (Version 2, June 2011).
² Id.
verifications are normally used within the industry.\textsuperscript{6} An example given is a self-declaration that conforms to International Organization for Standardization (ISO) 14021.\textsuperscript{7}

- ISO 14021 is an international standard for environmental labels that are self-declared by the producer. It provides guidance on terminology, symbols, and testing and verification methods that an organization should use for self-declaration of the environmental aspects of its products or services.\textsuperscript{8} The standard does not require third-party verification; it requires that claims be substantiated by the producer and verifiable by the consumer.\textsuperscript{9}

Second-party Verification

*Second-party verification* means that a buyer verifies that a supplier or the products of a supplier conform to a certain standard.\textsuperscript{10} Relevant examples include:

- The Ryegate Station’s harvesting policy states that Ryegate’s foresters or their agents will conduct periodic on-site inspections to determine compliance with the policy.\textsuperscript{11}
- The City of the Burlington Electric Department (BED) states that a BED forester monitors each harvest operation for the McNeil Station to ensure that the harvest is conducted properly.\textsuperscript{12}
- The Swedish Environmental Management Council’s basic requirements for procurement of renewable electricity (including biomass power) allow for the use of purchaser verification if third-party verification is not available and provide, as an example, that the purchaser may carry out an audit at a supplier in which documentation and other evidence is requested and scrutinized.\textsuperscript{13}

Third-party Verification

*Third-party verification* means that an independent third party verifies that a supplier or its products conform to a certain standard and is considered to provide the most assurance that a standard is met.\textsuperscript{14} Third-party verification can be by a governmental or nongovernmental entity:

- The two major systems requiring third party verification are the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification Schemes

\textsuperscript{6} Swedish Environmental Management Council (SEMC), “Procurement Criteria for Electricity, Basic Requirements” (Procurement Criteria) at 8 (v 1.0, April 4, 2008). Note that the Council states a belief that third-party verification is “safest and most reliable.”

\textsuperscript{7} Id.


\textsuperscript{9} Kun-Mo Lee and Haruo Uehara, Center for Eco Design and LCA, Ajou University, South Korea, “Best Practices of ISO 14021” at 25-6, 36-7 (2003).

\textsuperscript{10} WRI, Sustainable Procurement at 2.11.

\textsuperscript{11} Ryegate Associates, Ryegate Power Station, “Harvesting Policy for Whole Tree Chipping and Roundwood Operations in Vermont” at 1.


\textsuperscript{13} SEMC, Procurement Criteria at 9-10.

\textsuperscript{14} WRI, Sustainable Procurement at 2.11.
(PEFC). Both systems used accredited bodies for certification. PEFC is an endorsement system involving mutual recognition of national and regional certification systems.  

- In the United States and Canada, the Sustainable Forestry Initiative (SFI) is a PEFC-endorsed certification system. The SFI 2010-2014 standard states that it:

  [R]equires third-party independent certification audits by competent and accredited certification bodies for all certifications: forest land certification, fiber sourcing certification and chain of custody certification. All certification bodies must be accredited by a North American member of the International Accreditation Forum, i.e. ANSI-ASQ National Accreditation Board (ANAB), American National Standards Institute (ANSI) or the Standards Council of Canada (SCC).  

- The Northeast Master Logger’s Certification Program provides third-party certification of logging companies. The master logger certification is issued by the Trust to Conserve Northeastern Forest Lands, a nonprofit organization. Obtaining certification involves a multi-step process that includes an application, field review of 10 to 15 of a company’s harvest sites by independent verifiers, consideration of the application by a board representing multiple stakeholder interests, and post-certification auditing for two years.  

- Wisconsin uses a checklist completed by state natural resources personnel or a county forester during the close-out of a timber sale from state lands to confirm whether the state’s biomass guidelines for harvesting on state lands were followed.  

- Wisconsin also has considered the use of regular random sampling of harvested lands by state personnel as a means to monitor compliance with its biomass harvesting guidelines.  

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15 Id. at 2.16-2.17.  
16 SFI, Requirements for the 2010-14 SFI Program: Standards, Rules for Label Use, Procedures and Guidance, Sec. 1 at 1, 4 (Jan. 2010).  
20 Woody Biomass Harvesting Guidelines Implementation Plan Development: Report to the Wisconsin Council on Forestry at 3-4 (March 12, 2009) and attachment on monitoring (March 6, 2009); telephone communication from C. Hardin, Wisconsin Dept. of Natural Resources (Sep. 20, 2011).  
MEMORANDUM

To: Rep. Christopher Bray

From: Aaron Adler, Legislative Counsel

Date: November 24, 2010

Subject: Environmental and land use review of woody biomass energy and manufacturing projects

You asked for a summary of current state laws under which the impacts of woody biomass development projects would be reviewed, including electric generation stations, district heating, and non-generation stations such as wood pellet manufacturing plants. District heating may or may not include cogeneration. Below I list and summarize permits and approvals that appear likely to apply to such projects. This list is limited to permits and approvals related to environment and land use and may not be exhaustive. The permits or approvals potentially apply to all the types of projects under discussion except where noted below in italics.

- **Land use permit under Act 250 (manufacturing facility, district heating).** See 10 V.S.A. § 6001(3). An Act 250 permit would be required for a manufacturing facility such as a wood pellet plant, or a district heating project, if one of the jurisdictional thresholds is met. Relevant jurisdictional thresholds include:
  - For a commercial project, construction on a tract exceeding 10 acres in a town with zoning and subdivision bylaws or exceeding one acre in a town that does not have both such bylaws. 10 V.S.A. § 6001(3)(A)(i), (ii); Act 250 Rule 2(C)(5)(a). These thresholds would be relevant to a wood pellet plant.
  - For a municipal project, construction involving the physical alteration of more than 10 acres of disturbed land. 10 V.S.A. § 6001(3)(A)(v); Act 250 Rule 2(C)(5)(b). This threshold would be relevant to a municipal heating district.

Under the Act 250 process, a district environmental commission would measure the project against a list of environmental, land use, and economic criteria, including criteria related to air and water pollution, soil erosion, tariff, impact on governmental services, aesthetics, historic sites, wildlife habitat, growth in the town and region, agricultural and forest soils, energy conservation, and conformance with local and regional plans. 10 V.S.A. § 6086(a).
Certificate of public good under 30 V.S.A. § 248 (woody biomass electric generation facility) issued by the Public Service Board (PSB). A woody biomass electric generation facility requires a certificate of public good (CPG) from the PSB unless it is operated solely for on-site electricity consumption by the owners. 30 V.S.A. § 248(a)(2).

Review under 30 V.S.A. § 248 measures a project against economic, energy planning, land use, and environmental criteria. The PSB is required to give “due consideration” to most of the Act 250 criteria and to the plans and recommendations of the local governmental bodies and the recommendations of the regional planning commission. 30 V.S.A. § 248(b).

Electric generation facilities subject to PSB approval under 30 V.S.A. § 248 are exempt from Act 250. 10 V.S.A. § 6001(3)(D)(ii). In the case of woody biomass electric generation that is part of a district heating or manufacturing project, exemption of the generation from Act 250 may require clear demarcation and coordination of jurisdiction between the PSB and the district commission, assuming Act 250 applies to the heating or manufacturing project.

Municipal land use permit (manufacturing facility, district heating). Depending on whether a municipality has adopted land use bylaws and what land uses it has chosen to regulate, a municipal land use permit may be required for a woody biomass manufacturing plant or a district heating project. Municipalities often require conditional use approval for commercial projects, which at a minimum must include review of the impact of the project on community facilities, the character of the area affected, traffic, bylaws and ordinances in effect, and utilization of renewable energy resources. A municipality may include other standards in conditional use review, including one or more of the Act 250 criteria. 24 V.S.A. § 4414(3).

State law exempts from local land use review electric generation that is subject to PSB approval. 24 V.S.A. § 4413(b); 30 V.S.A. § 248. This may raise issues for demarcating and coordinating jurisdiction between a town and the PSB.

Air pollution control permits for construction or operation or both. 10 V.S.A. §§ 556, 556a; Vt. Air Pollution Control Regulations §§ 5-401, 5-501, 5-5003. The Agency of Natural Resources (ANR) administers the air pollution control program through the Air Pollution Control Division (APCD) of the Department of Environmental Conservation (DEC). Broadly speaking, these permits are required for sources of air contaminants and establish limits or controls on emissions of the contaminants to protect air quality. Id.; see also 10 V.S.A. § 558.

Permits for discharges to water. As a delegated state under the Clean Water Act and under authority of the state’s own water pollution control act, ANR administers a variety of discharge permits through DEC. These permits protect water quality. 33 U.S.C. § 1251 et seq., 10 V.S.A. chapter 47. Different permits apply to different types of discharges.

- Stormwater discharge permits apply to stormwater discharges from construction or operation or both. Each of these types of facilities will require authorization under the Construction General Permit for stormwater discharges into state waters or conveyances
leading to state waters during construction if the total land disturbance will be one acre or more. ANR, General Permit 3-9020 for Stormwater Runoff from Construction Sites § 1.1 (2008).

Each facility also may require a permit for stormwater discharges from the operation of the facility. These requirements may arise under federal or state law or both. The jurisdictional “triggers” for federal and state stormwater permits differ. For example, federal law applies to stormwater discharges from conveyances into U.S. waters (broadly defined). 33 U.S.C. § 1311(a), 1342(a), 1362(6), (7), (12), (14). State law requires a stormwater operating permit if the total impervious surface will be one acre or more and provides that ANR may require such a permit regardless of acreage if the discharge is into stormwater-impaired waters. See, e.g., 10 V.S.A. § 1264(d)(1)(D) and (E).

The review of a stormwater discharge may occur under a general or individual permit, depending on the facility and the discharge and whether the receiving water is not stormwater-impaired. See ANR, Vermont Multi-Sector General Permit 3-9003 for Stormwater Discharges Associated with Industrial Activity § 1.3 and Appendix D (2006); General Permit 3-9015 for New Stormwater Discharges to Waters That Are Not Principally Impaired by Collected Stormwater Runoff § B (2003).

Other discharge permits may be required if the facility has a water discharge that is not stormwater. 10 V.S.A. §§ 1259, 1263. The term “discharge” means placing, depositing, or emitting wastes, directly or indirectly, into an injection well or state waters; the term “wastes” is broadly defined. 10 V.S.A. § 1251(3), (12). There are direct discharge, indirect discharge, and underground injection control (UIC) permits. A direct discharge permit will apply to a discharge that is delivered by a conveyance (including over land) right to a surface water. An indirect discharge means any discharge to groundwater, whether subsurface, land-based, or otherwise. 10 V.S.A. § 1251(15). UIC permits apply to injection wells used as a means of discharging waste into the ground. 10 V.S.A. § 1251(14).

- **Potable water supply and wastewater permit.** A potable water supply and wastewater permit is required from ANR before, among other things, the construction of a new building or structure unless an exemption applies. 10 V.S.A. §§ 1973, 1974. These permits are required in order to protect human health and the environment by ensuring that water supplies are potable and that on-site waste disposal systems are properly constructed and operated. 10 V.S.A. § 1971(1). One or more of the facility types under discussion may be served by its own on-site water supply or wastewater system. However, if a site is served by municipal water or wastewater systems, it is possible that a permit may be granted based on proof that the facility has obtained an allocation from the municipality for water supply or wastewater disposal or both based on the facility’s estimated use.

- **Other potential permits.** Other permits or approvals could apply depending on the facts and circumstances of a proposed project and the relevant site. For example, a permit or conditional use determination from ANR would be required if one of the facilities is proposed to be constructed within a significant wetland or the required buffer zone of such a
wetland. 10 V.S.A. § 913(a). The review process for such a proposal evaluates its impacts on the functions and values of the wetland. 10 V.S.A. §§ 914(a), 6025(d)(5)(A)-(K); Vt. Wetland Rules § 9 (2010).

Please let me know if you have any questions.
## Distributed Wood Pellet Manufacturing/Use

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides commercial market for low grade timber, including markets for smaller woodlots</td>
<td>• More expensive than cord wood</td>
</tr>
<tr>
<td>• Provides reasonably priced, efficient residential and small business heating fuel</td>
<td>• Bulk delivery infrastructure may be inadequate</td>
</tr>
<tr>
<td>• Potentially lowers transportation cost with short hauls</td>
<td>• Current standards and labeling are inadequate</td>
</tr>
<tr>
<td>• More efficient combustion leading to lower emission than firewood</td>
<td>• Seasonal demand for pellets</td>
</tr>
<tr>
<td>• Less labor intensive for consumers</td>
<td>• Electricity required for pellet stoves</td>
</tr>
<tr>
<td>• Pellet use is a growth sector within forest products</td>
<td></td>
</tr>
<tr>
<td>• Safe product for home use</td>
<td></td>
</tr>
<tr>
<td>• Easily supplied by local markets</td>
<td></td>
</tr>
<tr>
<td>• Promotes local economy with labor and capital investment</td>
<td></td>
</tr>
<tr>
<td>• Steady year-round market for roundwood</td>
<td></td>
</tr>
<tr>
<td>• Promotes energy independence</td>
<td></td>
</tr>
<tr>
<td>• Lower cost than fuel oil and propane</td>
<td></td>
</tr>
</tbody>
</table>
### Commercial/Industrial/Institutional Thermal and Thermal-led Combined Heat and Power

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides higher efficiencies than electricity generation only</td>
<td>• Increased handling and inventory costs</td>
</tr>
<tr>
<td>• Provides commercial market for low grade timber</td>
<td>• Tends to be seasonal demand, for the harvester, impacting year-round cash flow.</td>
</tr>
<tr>
<td>• Promotes energy independence</td>
<td>• Higher processing and delivery cost</td>
</tr>
<tr>
<td>• Lower cost than fuel oil and propane</td>
<td>• Requires generally higher quality fuel</td>
</tr>
<tr>
<td>• Adaptable to any type of logging</td>
<td></td>
</tr>
<tr>
<td>• Available from local sources</td>
<td></td>
</tr>
<tr>
<td>• Promotes local economy with labor and capital investment</td>
<td></td>
</tr>
</tbody>
</table>

### Electrical generation

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promotes local economy with large number of on-site and jobs in supporting industries.</td>
<td>• Efficiency suffers when thermal capacity is not utilized</td>
</tr>
<tr>
<td>• Requires large capital investment, providing substantial property tax base</td>
<td>• Higher local truck traffic</td>
</tr>
<tr>
<td>• The only market for low grade chips</td>
<td>• Longer transportation distances for centralized large facilities</td>
</tr>
<tr>
<td>• Steady year round market</td>
<td>• May strain local wood supply, unless wood procurement is distributed</td>
</tr>
<tr>
<td>• Large scale allows for better emission controls</td>
<td>• In the absence of appropriate management practices, large-scale demand on resource may impact forest health.</td>
</tr>
<tr>
<td>• Electricity offers product versatility</td>
<td>• May require large public investment</td>
</tr>
<tr>
<td>• Promotes energy independence</td>
<td></td>
</tr>
<tr>
<td>• Replaces some fossil fuel use</td>
<td></td>
</tr>
<tr>
<td>• Provides incentive for forest management</td>
<td></td>
</tr>
<tr>
<td>• Contributes to baseload generation to compliment other renewables</td>
<td></td>
</tr>
</tbody>
</table>

### Residential Firewood

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To be included in final report</td>
<td>•</td>
</tr>
</tbody>
</table>
Co-Chair Rep. Chris Bray convened the working group.  

Minutes Reviewed  
The working group voted to accept the minutes from the previous meeting on Nov., 3, 2009.  

Discussion of Interim Report  
The working group discussed Bill Keeton’s edits to the interim report:  
- Appendix A  
  - Bullet three: What is the definition of regional coordination? The group agreed that this should be more specific and include the language “regional coordination may or may not include procurement guidelines” – the goal should be to keep topics specific yet flexible  
  - Bullet four: include language “the working group supports legislative action to increase truck weight limits for the transportation of forest products”  

The group unanimously accepted the draft of the interim report with the edits on agreement that it was a work in progress and able to be altered throughout the discussions.  

Discussion of Work Plans  

Forest modeling  
The group discussed several topics relating to modeling. It was stated that the most current data on forest modeling is not yet available for the U.S.D.A. Forest Inventory and Analysis (FIA), but when the data becomes available it will become an important part of biomass harvesting because it will be used to determine supply. The group then discussed whether the whole development of a biomass industry should be institutionalized using models that would show industry impacts over time, help with public outreach campaigns, and determine the logistics of the program including who pays for it and who provides updates to the models. Market modeling was also discussed as a way to help build a stable industry. The model should show how biomass markets respond to price fluctuations and what policies would support a biomass industry and which policies would support other forestry activities. Carbon modeling was discussed in terms of promoting carbon neutrality and long term carbon storage. Bill Keeton spoke on modeling that
UVM is engaged in. Carbon neutrality is based on time and special scales. Bill Keeton stated it would not be good policy to state that “biomass” is carbon neutral because it is a loaded term.

Enhancement and Development of Biomass Industry
The work plan for enhancing and developing a biomass industry should emphasize simplification. There should be incentives to start biomass projects that are relatively free of complications. Standards for efficiency of biomass projects are necessary to a sustainable industry. In addition, stability and consistency of markets promotes a viable industry that is diversified and supports individuals in the forest products industry. Members of the group stated concerns regarding the globalization of the biomass market. This is undesirable because it increases transportation of biomass material, decreasing its end efficiency. This would also be undesirable for local markets and local employment. Regional cooperation could help to resist the pressures of an overseas biomass market.

Maintaining Forest Health
The group discussed stewardship as the most efficient way to promote healthy forests. Start by determining what we want to retain in the forests versus what we want to remove from them. Include ongoing monitoring programs into the biomass industry objectives. The group discussed using procurement standards to encourage good forestry practices on the ground. Procurement standards will level the playing field if they can encourage the development of markets that favor sustainable harvesting methods. Using the standards, biomass purchasers would pay higher premiums for wood that is grown and harvested according to certain management standards. The greater the consistency in procurement standards, the greater the consistency in best management practices. The committee will set aside more time at a later date to further discuss procurement standards and best management practices. The forest health subcommittee will report more specific findings at the next meeting.

Concepts that apply to all work plans
- Public outreach--the greater the public knowledge and involvement, the more successful the program will be.
- Policy Objectives:
  - Promoting industry growth and monitoring activities go hand-in-hand.
  - ASME certification legislation
  - Contingency plans for salvage operations – to deal with diseased forests
- Current use/use value appraisal
  - This is likely to be modified soon by the legislature
  - The group agrees that the Use Value Appraisal program is an integral part of maintaining a forested landscape and promoting growth of forest industries, the disagreement is in how changes to the program will affect enrollment of forest lands.

Future Meetings
Next meeting: Presentation of interim report and case studies to the legislature. (Joint Nat. Res. and Ag. committees) – Wed. 1/20/10 9-11:30am Rm. 11 State House
- Subcommittees to present the different work plans
- Case studies to follow

Next full working group meeting – Monday, February 8, 2010 1-4pm @ the statehouse
BioE: Biomass Energy Development Working Group
MINUTES for Tuesday, March 16, 2010
1:00pm – 4:00pm
Room 410, Tax Building 166 State St.


MEMBERS NOT PRESENT: Sen. Ginny Lyons, Peter Condaxis, Paul Cate, Sam Miller

STAFF PRESENT: Leg. Counsel Intern Grahm Leitner, Asst. Catherine Russell

Convened
Co-Chair Rep. Chris Bray convened the working group.

Old Business: No minutes to approve from last meeting. Review of last month’s meeting regarding modeling and discussion of forest health.

New Business: Change of location for the next meeting. The new location will be the Governor’s Conference room in the Pavilion Building.

Subcommittee Presentations:

Forest Health Subcommittee – Bill Kropelin
  o A look at past Vermont harvesting data and current harvesting guidelines from various states.
    ▪ “Report on Chip Harvester Operations in Vermont, 1990” (see report)
    ▪ Compare Burlington Electric Department’s (BED) harvesting policies to that of other Midwestern and Eastern states (see chart and BED policies)
      • In-house policies at BED monitoring costs $1-2/ton of material
  o Discussion of Biomass Guidelines
    ▪ Third party certification could provide monitoring and standards that would ensure good forest practices
    ▪ Good forestry practices would build public support for biomass energy and industry
    ▪ The Forest Guild has been working on recommendations for biomass harvesting guidelines that should be finished by next meeting
      • Components: density of debris (# pieces/acre coarse woody debris vs. mass/acre), Forest Guild is working on across the board indicators of stand health specific to forest stand development conditions

Modeling Subcommittee:
  o BERC is completing the Forest Inventory Analysis (FIA)
    ▪ FIA uses the same counties as previous study
- Report can be complete by next meeting
  - Harvesting data is collected by county, whereas available biomass will be more site specific

*Enhancement and Development Subcommittee – Chris Recchia*

**Basic Principals**

- Facilities in this region seek to switch from oil to wood
  - Municipalities, schools, hospitals, homes, etc.
  - Outreach to facilities with the potential to convert to renewable heat and cogeneration systems
- One or more new electric facilities (25-50 MW)
  - Southern part of the state has excess supply of biomass
    - Citing of a facility is resource driven, not demand driven. 50 MW is not a significant portion of the electric demand of the state
- State Energy Plan (see pie chart)
  - Additional 1,000,000 tons of in-state harvest will only provide 1-2% of Vermont’s energy (heat and electric)
  - What are state incentives/disincentives?
    - Invite VEDA to committee
    - Use of municipal bonds – if you get public support, people will invest
      - Energy Czar – not popular, not efficient
        - Overused at federal level
        - Need for information dissemination, not a policy driver
- Green Energy Program (Clean Energy Development Fund)
  - Green zones (Montpelier/Randolph district heating plans require 3rd party certification to qualify)
  - Vermont is looking to build “green energy” infrastructure
- Questions to answer(sequential)
  - Find out how much wood?
  - What type of infrastructure do we want to invest in? (electric vs. thermal vs. cogeneration)
  - Decide where to provide incentives?

**Discussion:**

- What type of industry should the state promote?
Choose the best, most sustainable uses: local, useful, best practices, combined heat and power

Year round markets to avoid seasonal fluctuations in biomass industry

Citing considerations
  - CHP systems should be located where heat can be utilized (urban areas)

What are incentives for CHP?
  - Current policy and incentives are for electricity production
    - Tax credits for production and investments
  - No thermal incentives beyond those provided by the Clean Energy Development Fund

For Next Time:
  - Discussion of Procurement vs. Harvesting Guidelines
  - Each member to bring in outside information
  - ANR to provide facilitator
  - Attempt to form consensus on moving forward on development of standards to protect forest health

Schedule for upcoming meetings:
  - Tuesday, April 13th – Pavilion Building
  - Monday, May 17th
  - Thursday, June 10th
BioE: Biomass Energy Development Working Group  
MINUTES for Tuesday, April 13, 2010  
1:00pm – 4:00pm  
4th Floor Conference Room, Pavilion Building, Montpelier, VT


MEMBERS NOT PRESENT: Sen. Ginny Lyons, Kelly Launder

STAFF PRESENT: Leg. Counsel Intern Grahm Leitner, Asst. Catherine Russell, Ed O’Leary, Department of Forests, Parks, and Recreation

Convened
Co-Chair Rep. Chris Bray convened the working group.

Old Business:
- Motion to Approve last month’s minutes with minor revisions – Chris Recchia, 2nd – Bill Kropelin

New Business:
- Confirm dates for next meetings (May and June) – Catherine Russell to reserve rooms.
- Announcement by Grahm Leitner regarding participation in working group to fulfill requirements for a Vermont Law School George Perkins Marsh Fellowship. Grahm will be working with Michael O’Grady and the Bio-E Working Group over the summer to help draft the group’s recommendations and report to the Legislature.
- Announcement of Middlebury Biomass facility tour. Bio-E group would like to tour the facility and speak with staff regarding procurement standard development and hold our July meeting at the Middlebury campus.

Hand-out:
1. Biomass Procurement at Middlebury College: Assessments and Recommendations – Environmental Studies Senior Seminar, Middlebury College Fall 2009

Subcommittee Presentations:
Forest Health Subcommittee
Hand-outs:
1. Elements of a Wood Procurement Standard – Bill Kropelin
2. Summary of the Forest Guild’s Forest Biomass Retention and Harvesting Guidelines – Ehrhard Frost
Facilitated Negotiation

- The topic for April’s meeting is Procurement Standard vs. Harvesting Guidelines. Ed O’Leary has been asked to join the group for today’s meeting as a facilitator to guide the discussion.

- Definitions:
  - **Procurement Standard**: These are purchasing requirements that a facility must adhere to when purchasing biomass materials. They ensure that materials are sourced according to certain standards. One element of the procurement standard might be harvesting guidelines. Procurement standards may be voluntary or compulsory.
  - **Harvesting Standards**: These guide what happens in the field. They ensure that certain practices are followed by foresters, loggers, and/or landowners when harvesting biomass. The main purpose of harvesting guidelines should be to ensure that certain aspects of forest health are protected. They may be voluntary or compulsory.

- The voluntary vs. compulsory nature of procurement standards or harvesting guidelines was not part of the discussion, even though this may be important to the outcome. Instead, the focus was on listing the pros and cons of each.

- To begin the discussion, each member of the group was asked to spend five minutes listing the pros and cons of both Procurement Standards and Harvesting Guidelines.

- Next, all pros and cons were listed on white boards at the front of the room – approximately 30 minutes were spend listing pros and cons for each type of standard.

- Consideration of pros and cons: group was asked to hot dot five cons for each type of standard that had the potential to halt the development of that standard.
  - Issues that are most controversial:
    - **Procurement Standards**:
      1. Cost to state
      2. Inconsistent with other state programs (for biomass harvests)
      3. Complexity for field foresters
    - **Harvesting Guidelines**:
      1. Regional consistency
      2. Monitoring and Enforcement in difficult and expensive
      3. Divisive to forest industry
BioE: Biomass Energy Development Working Group
MINUTES for Wed., June 10, 2010
1:00 p.m. – 4:00 p.m.
Room 10, State House, Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Sam Miller, Robert Turner

Members Not Present: Bill Keeton, Kelly Launder, Sen. Ginny Lyons, Ben Machin, Chris Recchia, Sec. Jonathan Wood (co-chair)

Staff Present: Aaron Adler (Legislative Counsel), Graham Leitner (Intern, Leg. Council)

Others Present: Barbara Burns (DFPR), Bob DeGeus (DFPR), Sandy Wilmot (DFPR), Adam Sherman (BERC), Sarah Galbraith (BERC)

MINUTES:

Co-chair Rep. Bray convened the meeting. The minutes of May 17, 2010 were approved.

Barbara Burns and Sandy Wilmot of the Department of Forests, Parks and Recreation (DFPR) made a presentation on forest health and DFPR activities on forest health, including a power point. Following the presentation, the working group discussed DFPR’s role and activities related to data-gathering and promoting forest health.

The working group then discussed draft biomass harvesting guidelines produced by the Forest Health (FH) subcommittee.

There was no report from the modeling committee. A. Sherman reported that BERC is moving to complete the basic update and refine relevant data sets.

The working group then discussed the written report of the enhancement and development working group dated June 10, 2010, including possibly adding an ad hoc working group member with knowledge of development and energy issues. B. DeGeus suggested contacting Alex Ibey, which P. Condaxis volunteered to do.

J. Fidel reported on the ongoing public forums sponsored by BERC, VNRC and others.

NEXT MEETINGS:

July 20, 2-6 p.m. – Middlebury College, information to be distributed by G. Leitner.

August 17, 1 – 4 p.m. – Montpelier, location TBA.

September 16, 1 – 4 p.m., Montpelier location TBA.
BioE: Biomass Energy Development Working Group
MINUTES for Tues., July 20, 2010
2:00 p.m. – 6:00 p.m.
Middlebury College, Middlebury, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Bill Kropelin, Sen. Ginny Lyons, Ben Machin, Sam Miller, Robert Turner

Members Not Present: Jamey Fidel, Ehrhard Frost, Bill Keeton, Kelly Launder,
Staff Present: Aaron Adler (Legislative Counsel), Michael O’Grady (Legislative Counsel), Catherine Russell (Committee Assistance)

MINUTES:

Co-chairs Rep. Bray and Sec. Wood convened the working group.

The working group visited sites at Middlebury College related to the College’s use of woody biomass to produce heat and electricity. The group visited willow groves that the College planted to provide fuel. The group then toured the College’s power plant, viewing the equipment in the plant related to fuel intake and biomass energy production.

The working group then met at the College’s Franklin Environmental Center.

During this meeting, the working group discussed the following topics:

1. Draft biomass harvesting guidelines produced by the Forest Health subcommittee.
2. Public forums sponsored by the Biomass Energy Resource Center, Vermont Natural Resources Council and others and the relationship of the forums to the group’s work.
3. The Biomass Sustainability and Carbon Policy Study prepared by the Manomet Center for Conservation Sciences for the Massachusetts Department of Energy Resources.
4. Preparation of the working group’s interim report due later this year. Directions were given to the subcommittees to move forward with their reports for discussion by the full group and potential inclusion in the interim report.
5. Scheduling of future meetings.

No formal actions were taken by the working group during the meeting. The group adjourned the meeting at approximately 6:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Tues., Aug. 17, 2010
1:00 p.m. – 4:00 p.m.
Room 11, State House, Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Jamey Fidel, Ehrhard Frost, Bill Keeton, Bill Kropelin, Sam Miller, Robert Turner

Members Not Present: Kelly Launder, Sen. Ginny Lyons, Ben Machin, Chris Recchia,

Staff Present: Mike O’Grady (Legislative Counsel)

Others Present: Adam Sherman (BERC)

MINUTES:

Co-chair Rep. Bray convened the meeting. The minutes of July, 2010 were not yet complete, and the group passed over approval of the minutes of the previous meeting.

Pat Bartlett, a consulting forester and wildlife management consultant for Bartlett Forestry and Wildlife, presented a video to the group regarding whole tree harvesting for biomass energy production. Mr. Bartlett discussed the economics of whole tree harvests for biomass energy production. Mr. Bartlett also discussed the forest health and animal habitat benefits of whole tree harvests. In addition, Mr. Bartlett recommended that foresters and loggers complete a workshop regarding the proper planning and layout of a harvest site in order to maximize harvest and reduce cost. Mr. Bartlett also recommended newspaper notification and other community notifications of upcoming whole tree harvests for biomass.

The working group then discussed the work of the working group subcommittees.

Peter Condaxis of the development and enhancement subcommittee stated that due to recently revised wood supply estimates, the subcommittee needed to revise the proposals of the subcommittee. The revised proposal will be presented to the group at the September meeting.

Ehrhard Frost of the Forest Health Subcommittee presented to the group the revised Recommended Guideline for Maintaining Water Quality, Soil Productivity and Biological Diversity on Harvesting Jobs in Vermont (previously titled Recommended Woody Biomass Retention Guidelines). The group discussed a new guideline advising that whole tree harvesting be avoided on low-nutrient sites as well as steep slopes and erosion prone sites. The group recognized that consideration of this concept and its underlying rationale is worthwhile, but the language may need to be revised in order to address concerns of group members and to make the guideline workable for foresters and loggers. Suggested edits of the language will be sent to Bill Kropelin for potential revision by the Forest Health Subcommittee.
Jamey Fidel of the Forest Health Subcommittee then circulated notes with preliminary proposals from the subcommittee addressing each of the issues set forth in Act No. 37 of the 2009 Session that the subcommittee is charged with addressing. The working group reviewed the notes and agreed that they were helpful, but significant additional time was necessary for group discussion of the proposals. Time will be scheduled for this discussion at the September meeting.

Robert Turner of the Modeling Subcommittee reported that BERC will issue in October the revised Vermont Wood Fuel Supply Model contracted for by Department of Forests Parks and Recreation. The group discussed preliminary results of the BERC revision and the fact that the U.S. Forest Service Forest Inventory and Analysis (FIA) from 1997 overestimated the forest inventory in Vermont.

Michael O’Grady then discussed with the working group the format and schedule for the second interim report of the group. A preliminary draft of the second interim report will be presented to the group at the September meeting.

The group then rescheduled the September meeting to Sept. 9, from 9:00 a.m. until 3:00 p.m. in Room 10 of the State House.

J. Fidel reported on support for additional public forums on biomass use and development in Vermont.

NEXT MEETINGS:

September 9, 9:00 a.m. – 3:00 p.m., Montpelier, State House Room 10.
BioE: Biomass Energy Development Working Group
MINUTES for Fri., Oct. 8, 2010
10:00 a.m. – 4:00 p.m.
Room 10, State House, Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Jamey Fidel, Ehrhard Frost, Bill Keeton, Bill Kropelin, Sen. Ginny Lyons (by phone), Ben Machin, Sam Miller, Chris Recchia

Not Present: Robert Turner

Staff Present: Michael O’Grady (Legislative Counsel), Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance), Rosalind Daniels (Committee Assistance)

MINUTES:

Co-chairs Rep. Bray and Sec. Wood convened the working group.

The working group approved the minutes of its July 20, 2010 meeting with the following revision: The phrase “harvest land site size” is changed to “landing size.”

The working group approved the minutes of its August 17, 2010 meeting with the following revision: In the paragraph beginning “Ehrhard Frost of the Forest Health Subcommittee presented,” third sentence, strike the phrase: “The group recognized that consideration of this concept and its underlying rationale is worthwhile, but” and keep the remainder of the sentence.

The working group reviewed and discussed the preliminary draft of its second interim report prepared at its request by legislative counsel. The working group made various changes to the draft interim report during the meeting. The working group also directed legislative counsel to make other changes for which counsel would suggest draft language for review by the working group at the next meeting.

On the draft report, the working group set up the following process and schedule. Members will provide legislative counsel with further comments and information by October 13, 2010 and legislative counsel will circulate a revised draft by October 15, 2010. In the revised draft, legislative counsel will highlight all changes made, noting the source of each change.

Co-chair Rep. Bray identified several possible topics for the working group’s future consideration, including:

- The status of the comprehensive energy plan prepared by the Department of Public Service and the relationship of the working group’s reports and work to that plan.
- Draft legislation to enable municipalities to establish heating districts.
- The relationship of the working group’s reports and work to the 25 by 25 initiative endorsed by resolution of the General Assembly (R-409 of the 2005-06 biennium).
• Research into how to account for and quantify the carbon impacts of using woody biomass for energy production.
• Alternative funding sources to support energy production from woody biomass.
• Presentation by member Bill Keeton on harvesting.

Legislative counsel provided the members with copies of the biomass section of the Department's current draft comprehensive energy plan.

The working group discussed future scheduling. In addition to the schedule discussed above for revisions to the draft report, the working group will hold its next meeting at the State House on November 8, 2010 starting at 1:00 p.m. and will convene a public hearing on the draft interim report on November 30, 2010 from 7:00 to 8:30 p.m., location to be determined.

The meeting adjourned at approximately 4:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Mon., Nov. 8, 2010
1:00 p.m. – 4:00 p.m.
Room 11, State House, Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Peter Condaxis, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Sam Miller, Chris Recchia

Not Present: Paul Cate, Bill Keeton, Sen. Ginny Lyons, Ben Machin, Robert Turner

Staff Present: Michael O’Grady (Legislative Counsel), Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance), Rosalind Daniels (Committee Assistance)

MINUTES:

Sec. Wood convened the working group. Co-chair Rep. Bray arrived later due to weather.

The working group approved the minutes of its Oct. 8, 2010 meeting.

The working group discussed additional issues or news that the group should address in the future, including wood pellet content.

The working group reviewed the group’s schedule and the process for review and final approval of the draft second interim report. The group discussed the location and process for the scheduled public meeting on Nov. 30. The group also scheduled a meeting on December 15, 2010 to review and respond to the comments from the public meeting. A tentative meeting was also scheduled for January 10 if additional revision of the report is required.

The working group then reviewed and edited the draft second interim report. Michael O’Grady of Legislative Council reviewed the Modeling Subcommittee recommendations, to which the working group made edits. Michael O’Grady then reviewed the Forest Health subcommittee recommendation, to which the working group made edits. Aaron Adler of Legislative Council reviewed the recommendation of the Enhancement and Development subcommittee, to which the working group made edits.

The working group next voted to approve the recommendations of the Forest Health and Enhancement and Development subcommittees as recommendations of the full working group. The recommendations of the Modeling subcommittee had previously been approved as group recommendations.

The working group concluded with a brief discussion of additional issues to address at future meetings.

The meeting adjourned at approximately 4:15 p.m.
MINUTES for Tues., Nov. 30, 2010
7:00 p.m. – 8:45 p.m.
Red School House Conference Room
Vermont Technical College, Randolph, Vermont

Members Present:  Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Bill Keeton, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Ben Machin, Sam Miller, Chris Recchia, Robert Turner

Not Present:  Sen. Ginny Lyons

Staff Present:  Michael O’Grady (Legislative Counsel), Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance), Katie McLinn (Intern, Legislative Council)

MINUTES:

The Working Group convened a public hearing at 7:00 p.m. on its draft interim report to be submitted by January 15, 2011 to the general assembly. Citizens who attended and completed a “sign-up” sheet are on the attached list. A summary of the comments made during the hearing is available at this link:


The hearing followed the following schedule:

a. Call to order, welcome, and description of the evening’s agenda and format by Co-chair Rep. Bray.

b. Summary of the act creating the Working Group, the Group’s activities to date, and the draft interim report by Counsel O’Grady.

c. Brief presentations by Working Group members to introduce each of four break-out sessions scheduled to occur: wood supply modeling (Turner), enhancement and development of woody biomass Condaxis), maintaining forest health (Kropelin), and general comments (Co-chair Sec. Wood).

d. Break-out sessions for each of the areas described in c, immediately above. During this period, groups of attendees gathered in separate locations set up for each of those areas, with a laptop and easel at each location on which comments raised by members of the public were recorded.

e. A reconvened session of the full Working Group, during which the comments recorded on easel paper were displayed for the full group and all attendees. A member of the Group reported the comments made during each of the break-out sessions: wood supply modeling (Turner), enhancement and development (Recchia), forest health (Fidel), and general comments (Co-chair Sec. Wood). The Working Group then heard additional comments from members of the public.
During the hearing, the Working Group informed those attending that written comments on the draft interim 2011 report could be submitted through December 7, 2010 and advised them that the Working Group planned to meet to discuss the comments on the draft report and any changes to the report on December 15, 2010 and, if necessary, on January 10, 2010, and to submit the interim report to the general assembly by January 15, 2010. They were also informed that the interim report will include, as appendices, a summary of the oral comments from the November 30 hearing and the written comments received by December 7.

The meeting adjourned at approximately 8:45 p.m.

Attachment: List of attending citizens
ATTENDEES, 11-30-10 PUBLIC HEARING
BIOMASS ENERGY DEVELOPMENT WORKING GROUP

Except for the members of the Biomass Energy Development Working Group and its staff assistants, below are listed the names of those who attended the Working Group’s public hearing on November 30, 2010 at Vermont Technical College in Randolph, Vermont and who listed their names on a “sign-up” sheet.

John Bethune
Carl Bielenberg
Jon Binhammer
Gaelan Brown
Heath Bunnell
Donna Barlow Casey
John Clark
Matt Colburn
Marc DiMario
Al Floyd
David Frank
Harold Garabedian
Peter Gill
Steve Hardy
Robbo Holleran
Ann Ingerson
Grahm Leitner
Abe Lewis
Tim Maker
Chris Matera
Anthony Mennona
Edith Pike-Biegunska
Frank Reed
Joan Richmond-Hall
Josh Schlossberg
Adam Sherman
Rich Turner
Dan Young
BioE: Biomass Energy Development Working Group
MINUTES for Wed., Dec. 15, 2010
1:00 p.m. – 4:00 p.m.
Room 11, State House
Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Bill Keeton (by phone), Jamey Fidel, Ehrhard Frost, Bill Kropelin, Sen. Ginny Lyons, Chris Recchia, Robert Turner

Not Present: Ben Machin, Sam Miller

Staff Present: Michael O’Grady (Legislative Counsel), Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance)

MINUTES:

The Working Group approved the minutes of its meetings of November 8, 2010 and November 30, 2010, with the direction that legislative counsel add to the November 30 minutes a web link to the summary of oral comments received at that meeting on the draft interim report to be submitted by January 15, 2011 to the general assembly.

The Working Group discussed oral and written comments received on that draft report and the possibility of changes to the draft.

During the meeting, the Working Group created a list of issues potentially to be addressed by the group during the upcoming year, without deciding whether to include these issues in its future work. The listed issues included consideration of biochar, impacts of biomass energy use on public health, the relationship of the group’s work to the state energy plan, carbon impacts of biomass energy generation, use of roundwood, management of forest resources, the extent to which existing regulatory processes include review of a project’s impacts on the woodshed, the enhancement of existing activities that use biomass to produce energy, and consideration of short rotation woody crops.

The Working Group did not decide whether to make any changes to the draft report. Instead, the members agreed that by December 24, 2010 they would each prepare any proposed comments and changes to the report, to be circulated to the Working Group for consideration at its next meeting.

The Working Group decided to schedule its next meeting for January 4, 2011.

The Working Group adjourned its meeting at approximately 4:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Wed., Jan. 4, 2011
1:00 p.m. – 4:00p.m.
Room 10, State House
Montpelier, Vermont

Members Present: Rep. Chris Bray (co-chair), Sec. Jonathan Wood (co-chair), Rocky Bunnell, Paul Cate, Peter Condaxis, Bill Keeton, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Sen. Ginny Lyons, Ben Machin (by phone), Sam Miller, Chris Recchia, Robert Turner

Staff Present: Michael O’Grady (Legislative Counsel), Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance)

MINUTES:

The Working Group approved the minutes of its meeting of December 15, 2010.

The Working Group discussed oral and written comments received on the draft interim report to be submitted by January 15, 2011, including proposed changes circulated by members of the group.

During the meeting, the Working Group voted unanimously to make changes to the draft interim report discussed during the meeting, except for a change proposed by Mr. Fidel with respect to the draft interim report’s discussion of whether biomass procurement standards should require third-party certification. All members of the Working Group voted in favor of the change except for Mr. Condaxis, who voted in the negative. The subject language can be found in the interim report, at the following link, in Sec. II.C.2.vi (pp. 23-4):


The Working Group then voted unanimously to accept the interim report as edited during the meeting, subject to technical corrections by the office of legislative council.

Mr. Wood abstained from all votes during the meeting.

The Working Group adjourned its meeting at approximately 4:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Monday, April 11, 2011
1:30 p.m. – 4:00 p.m.
Room 10, State House
Montpelier, Vermont

Members Present: Sen. Ginny Lyons (co-chair); Deputy Sec. Chris Recchia (co-chair) Rocky Bunnell, Paul Cate, Ehrhard Frost, Bill Kropelin, Ben Machin, Rep. John Malcolm, Sam Miller, Robert Turner

Absent: Bill Keeton, Jamey Fidel, George Nagle

Staff Present: Aaron Adler (Legislative Counsel), Michael O’Grady (Legislative Counsel), Catherine Russell (Committee Assistance)

MINUTES:

Counsel Adler convened the Working Group and requested nominations for the legislative co-chair position. Mr. Recchia nominated Sen. Lyons, seconded by Mr. Machin. The Working Group voted unanimously to elect Sen. Lyons co-chair.

Sen. Lyons then requested nominations for the second co-chair position. Mr. Machin nominated Mr. Recchia, seconded by Mr. Turner. The Working Group voted unanimously to elect Mr. Recchia co-chair.

The status of replacement appointments to the Working Group was summarized. Rep. Malcolm was appointed as the legislative member from the House of Representatives to replace former Rep. Bray. Mr. Recchia is now a member as designee of Secretary of Natural Resources Deborah Markowitz. Adam Sherman may be chosen as the representative from the Biomass Energy Resource Center but this appointment has not yet been made. Mr. Nagle is designated from the Department of Public Service. There has been no appointment yet to replace Peter Condaxis.

The Working Group addressed reformulating the membership of its subcommittees, tentatively as follows: (a) forest health – Cate, Fidel, Frost, Keeton, Kropelin; (b) modeling – Machin, Turner, BERC representative; and (c) enhancement and development – Bunnell, Malcolm, Miller, Nagle, Recchia, BERC representative. Members were requested to e-mail Ms. Russell with subcommittee preferences. Subcommittees should prepare work plans for consideration at the next meeting.

The Working Group considered the issues for further working group action listed in Sec. III of its interim report dated January 9, 2011. The group decided not to pursue further issue nos. 4 (public health impacts) and 10 (use of biochar). The group also decided that issue nos. 1 (state energy plan) and 2 (greenhouse gas emissions and carbon accounting) would be discussed as
relevant to the remaining issues listed in Sec. III. On the remaining issues, the Working Group tentatively assigned consideration of them to its subcommittees as follows:

**Enhancement and Development**
3 (siting and permitting process for biomass energy facilities)
5 (alternative funding sources for developing biomass energy)
9 (enhancement of existing activities, including use of firewood)

**Modeling**
6 (monitoring of forest health, harvests, and woody biomass use)

**Forest Health**
7 (harvest practices at sites in northern New England and New York)
8 (management of forest resources)
11, 12 (use of roundwood and short rotation woody crops)

The Working Group requested that legislative counsel develop a draft time line for preparation of the final report for consideration at its next meeting.

The Working Group received an update from legislative counsel on a recent ruling by the Public Service Board on the scope of its jurisdiction over biomass energy and wood pellet manufacturing plants proposed by Beaver Wood Energy, LLC.

The Working Group adjourned its meeting at approximately 4:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Tuesday, May 17, 2011
1:00 p.m. – 4:00p.m.
Room 10, State House
Montpelier, Vermont


Absent: Ben Machin, Sam Miller

Staff Present: Aaron Adler (Legislative Counsel), Catherine Russell (Committee Assistance), Agatha Kessler (Committee Assistance)

MINUTES:

On motion of Mr. Frost, the Working Group approved the minutes of its meetings of January 4 and April 11, 2011.

Co-chair Recchia reported that the status of replacement appointments to the Working Group has not changed since the meeting of April 11, 2011.

Mr. Keeton gave a presentation to the Working Group on his recent research concerning harvesting practices in New England and New York and on the carbon impacts of harvesting.

Mr. Nagle reported to the Working Group concerning the development of the comprehensive energy plan (CEP) by the Department of Public Service (DPS). He noted that the DPS time frame for plan development is not in sync with the time frame for the Working Group’s final report. Co-chairs Lyons and Recchia requested that Mr. Nagle give a regular update on CEP development at each Working Group meeting, to which Mr. Nagle agreed. Working Group members may provide input to the CEP process as individuals and the group may decide at a later date to provide comments or information to the DPS.

The Working Group discussed subcommittee work plans circulated by the Forest Health and Modeling Subcommittees. These working groups may produce language on specific issues at monthly intervals for discussion by the full working group over the summer and early fall. The Enhancement and Development Subcommittee will produce a proposed work plan for consideration at the Working Group’s next meeting. It was noted that some issues, flagged in the January 9, 2011 interim report for further group consideration, had not been assigned specifically to a subcommittee (e.g., energy conversion efficiency and, in the context of procurement standards, independent verification).

The Working Group requested that legislative counsel: (a) review the 2011 interim report and, for its next meeting, provide the group with a list of the issues denoted in the report for further
group consideration; and (b) for a future meeting, compile a list of potential independent verification mechanisms that may be in use or proposed in Vermont or elsewhere, with brief descriptions.

Legislative counsel reviewed with the Working Group a draft time line for preparation of a final report, which the members are to review before and discuss at the next meeting.

The Working Group scheduled future meetings for June 14 (12-3 p.m.), July 19 (1-4 p.m.), and August 25 (1-4 p.m.), 2011.

The Working Group adjourned its meeting at approximately 4:00 p.m.
MINUTES for Tuesday, June 14, 2011
12:00 p.m. – 3:15 p.m.
Room 10, State House
Montpelier, Vermont

Members Present:  Sen. Ginny Lyons (co-chair); Deputy Sec. Chris Recchia (co-chair), Paul Cate, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Rep. John Malcolm, Sam Miller, George Nagle, Robert Turner

Absent:  Rocky Bunnell, Bill Keeton, Ben Machin

Staff Present:  Aaron Adler (Legislative Counsel), Agatha Kessler (Committee Assistance)

MINUTES:

On motion of Mr. Kropelin, the Working Group approved the minutes of its meeting of May 17, 2011.

At the request of the Working Group, Adam Sherman of the Biomass Energy Resource Center sat with the Working Group members.  Mr. Sherman did not participate in any votes.

The Working Group reviewed the memorandum of May 23, 2011 from legislative counsel on issues denoted for further discussion in the January 2011 interim report.  The Group made the following assignments of the issues as listed in that memorandum:  issues 1 (limitations in the wood fuel supply model) and 2 (entity to update list monitoring activities; review of existing monitoring) to the Modeling Subcommittee; issues 3 (pros and cons of areas of growth), 4 (funding sources for recommended actions), and 8 (energy conversion efficiency) to the Enhancement and Development Subcommittee; and issues 5 (site suitability; approaches to monitoring harvest activities; education and outreach; periodic AMP evaluation) and 6 (procurement standard) to the Forest Health Subcommittee.  On issue 7 (independent verification), legislative counsel will report back to the Working Group with a list of potential verification mechanisms and the Forest Health Subcommittee also has begun discussions.  On issue 8 (energy conversion efficiency), Co-chair Recchia indicated that, following Enhancement and Development’s consideration, other subcommittees likely will need to consider the issue.

The Working Group heard brief updates as follows:  from Mr. Nagle on the development of the comprehensive energy plan (CEP) by the Department of Public Service (DPS); from Mr. Turner concerning the Modeling Subcommittee; and from Mr. Kropelin on the Forest Health Subcommittee.

The Working Group then convened a joint meeting with the DPS to receive stakeholder comments on issues related to biomass for the purpose of the Working Group’s activities under Act No. 37 (2009) and the DPS’s preparation of the CEP.  Ed Delhagen of the DPS attended, in addition to Mr. Nagle.  Persons providing testimony included:  Tim Maker, Community Biomass
Systems; Tom Emero, Beaver Wood Energy; Jeff Forward, Forward Thinking Consultants, LLC, for the Southern Loop Combined Heat and Power Fund Committee; Carl Bielenberg, Gazogen, Inc.; Netaka White, Biofuels Director, Vermont Sustainable Jobs Fund; Barry Bernstein, Better World Systems, LLC; David Ellenbogen, Sierra Club (Vermont Chapter); Josh Schlossberg, Global Justice Ecology Project, reading a letter from William Moomaw, Professor, Tufts University; David Frank, Sunwood Biomass Systems, LLC, for his company and Renewable Energy Vermont; and Peter Condaxis, Ryegate Power Station.

The Working Group adjourned its meeting at approximately 3:15 p.m. The Working Group’s next meetings are scheduled for July 19 (1-4 p.m.), and August 25 (1-4 p.m.), 2011.
Members Present: Sen. Ginny Lyons (co-chair); Deputy Sec. Chris Recchia (co-chair), Chris Brooks, Rocky Bunnell, Paul Cate, Jamey Fidel, Ehrhard Frost, Bill Keeton, Bill Kropelin, Rep. John Malcolm, George Nagle, Robert Turner, Sam Miller

Absent: Ben Machin

Staff Present: Michael O’Grady (Legislative Counsel), Agatha Kessler (Committee Assistance)

Minutes:

Co-chair Recchia introduced Chris Brooks of the Vermont Wood Pellet Company who replaces Peter Condaxis as one of the two working group members from an industry, organization, utility, or corporation that either produces electricity or heat from biomass.

On motion of Mr. Turner, the Working Group approved the minutes of its meeting of June 14, 2011.

Mr. Nagle reported to the Working Group concerning the development by the Department of Public Service (DPS) of the comprehensive energy plan. DPS has finished public comment and is now drafting or redrafting chapters in response to comment. The Department hopes to have a public review draft by the end of the summer.

The Enhancement and Development Subcommittee provided an update on the subcommittee’s work and circulated a work plan. The subcommittee has identified three main areas to evaluate or examine: 1) the pros and cons of commercial/industrial thermal and thermal-led combined heat and power, wood pellet manufacturing/use, and electrical generation; 2) funding sources for biomass development; and 3) consideration of a conversion efficiency standard for the development of biomass electricity generating facilities. Mr. Turner recommended that the subcommittee review the effectiveness of funding incentives. Mr. Kropelin recommended that the subcommittee look at more than conversion efficiency of generating facilities, such as job benefits and energy security.

The Working Group also discussed whether woodshed impact requirements, such as those for the McNeil and Ryegate generating stations, should be required or considered in the permitting biomass facilities or uses. The Working Group requested that the Forest Health Subcommittee provide input at the August meeting regarding where and how woodshed impacts are considered in siting.

The Working Group next discussed to what extent it should provide recommendations to the legislature regarding the use of firewood.
The Forest Health Subcommittee then circulated and discussed a task outline and timeline for the subcommittee. The subcommittee also distributed three papers regarding: 1) use of short-rotation wood crops for fuel; 2) forest management issues; 3) and notes on the use of round wood. Commissioner of Forests, Parks and Recreation (FPR) Michael Snyder discussed FPR’s review of the acceptable management practices and potential revision to the standards.

The Modeling Subcommittee reported on work of the subcommittee and distributed an initial draft of subcommittee language for the final report of the Working Group. The subcommittee also distributed a table identifying ongoing, public and private forest monitoring activities in the state. The Working Group discussed data missing from existing monitoring activities, with a specific question raised regarding whether any entity or monitoring analyzes or quantifies land converting from forest use to other use. The Working Group noted the need to revisit the issue of tracking land conversion.

Co-chair Recchia announced the resignation of Ben Machin from the Working Group.

Co-chair Lyons asked each subcommittee to provide preliminary recommendations for the final report at the August 25 meeting of the Working Group.

The Working Group scheduled a future meeting for September 13, 2011 (1 to 4 p.m.).

The Working Group adjourned its meeting at approximately 4:00 p.m.
BioE: Biomass Energy Development Working Group
MINUTES for Tuesday, August 25, 2011
1:00 p.m. – 4:15 p.m.
Room 10, State House
Montpelier, Vermont

Members Present: Deputy Sec. Chris Recchia (co-chair), Rocky Bunnell, Jamey Fidel, Ehrhard Frost, Bill Keeton, Bill Kropelin, Rep. John Malcolm, Sam Miller, George Nagle, Robert Turner

Absent: Sen. Ginny Lyons (co-chair), Chris Brooks, Paul Cate

Staff Present: Aaron Adler (Legislative Counsel), Shirley Adams (Committee Assistance)

MINUTES:

On motion of Mr. Miller, the Working Group approved the minutes of its meeting of July 19, 2011.

The Working Group heard presentations as follows:

a. Chris Flinn and John Bootle of Renewable Energy Resources (RER) concerning RER’s development of switchgrass energy.

b. Jake Gross and Nick Dubois of Avatar Energy on Avatar’s anaerobic digesters.

c. Tom Tailer of the Vermont Sustainable Heating Initiative regarding the availability of woody biomass for energy production, the relative efficiencies of various energy production technologies that use woody biomass, and the Initiative’s recommendation in favor of wood pellet heating.

Mr. Nagle presented an update on the development of the comprehensive energy plan.

Mr. Turner presented a brief update on the modeling subcommittee. The Working Group discussed the extent to which modeling incorporates landowner views and preferences.

Mr. Kropelin gave an update on the forest health subcommittee and handed out notes from the subcommittee’s call of August 18, 2011. The subcommittee is discussing procurement standards and harvesting guidelines. It plans to recommend inclusion of harvesting guidelines in procurement standards. The Working Group discussed whether there should be clarification, possibly through statutory change, on how regulatory processes (e.g., Act 250 and Public Service Board siting review), address impacts of proposed biomass facilities on forest health.

Mr. Miller and Co-chair Recchia gave an update on the enhancement and development subcommittee and handed out an interim report of the subcommittee, the subcommittee’s current work plan, and an article on the price of oil. The subcommittee appears to be in general agreement on supplementing or replacing fuel oil for home heating with wood. The
The subcommittee is creating a matrix of the pros and cons of the various potential avenues of development (e.g., commercial/industrial thermal, wood pellet use, etc.) that it is examining.

The Working Group discussed scheduling and a timeline for future meetings and preparation of its final report and arrived at the following schedule:

1. **9/15/11 (1-4 p.m.)** – next Working Group meeting
2. **By 10/6/11,** all subcommittee drafting completed and submitted to Working Group
3. **10/6/11 (1-4 p.m.)** – Working group meets to discuss subcommittee drafts and report preparation and provide, as feasible, drafting direction to legislative council
4. **10/27/11 (1-4 p.m.)** – Working group meets to discuss subcommittee drafts and report preparation and provide further drafting direction to legislative council
5. **By 11/7/11** – Legislative council prepares draft report for working group review; the same draft is provided to the Vermont Roundtable with a request for comment
6. **11/10/11 (1-4 p.m.)** – Working group meets to review draft report, make changes, authorize release for public review
7. **By 11/16/11** – Draft final report issued for public review
8. **12/6/11 (7 p.m.)** – Public hearing on draft report
9. **By 12/12/11** – Written comments due
10. **12/13/11** – Working Group meets to consider comments and potential changes to draft report
11. **1/3 or 1/4/12** (tentative) – Further working group meeting on changes to draft report, if needed
12. **By 1/15/12** – Submit final report

The Working Group adjourned its meeting at approximately 4:15 p.m. Next meetings of the Working Group are as stated above.
BioE: Biomass Energy Development Working Group  
MINUTES for Tuesday, September 15, 2011  
1:00 p.m. – 4:15 p.m.  
Room 10, State House  
Montpelier, Vermont  

Members Present: Sen. Ginny Lyons (co-chair), Deputy Sec. Chris Recchia (co-chair), Chris Brooks, Rocky Bunnell, Paul Cate, Jamey Fidel, Ehrhard Frost, Bill Kropelin, Rep. John Malcolm, Sam Miller, Adam Sherman, Robert Turner  

Absent: Bill Keeton, George Nagle  

Staff Present: Aaron Adler (Legislative Counsel), Shirley Adams (Committee Assistance)  

MINUTES:  

On motion of Mr. Fidel, the Working Group approved the minutes of its meeting of August 25, 2011.  

Mr. Turner gave a presentation on the development, by the North East State Foresters Association, of a model for forestry analysis that would inform biomass energy projects and, among other things, be able to make 30-year projections and incorporate new data as released, and include data on multiple landowner classes, forest growth dynamics, and market considerations. Mr. Brooks raised the question of harvesting capacity’s not being included in the model and Mr. Turner suggested that this question should be on the list of issues for further research.  

Mr. Miller presented an interim report of the Enhancement and Development Subcommittee. The subcommittee’s discussion includes tax incentives for biomass and assignment of priority to home heating for wood. The Working Group discussed the issue of labeling pellets sold in Vermont. Mr. Turner and co-chair Recchia suggested the importance of including background and context in the report’s discussion of enhancement and development recommendations. Mr. Fidel raised the question of including an evaluation of the pros and cons of a power plant, as recommended in the January 2011 interim report and included in the subcommittee’s work plan. Co-chair Recchia stated that the subcommittee is planning to include evaluation of the pros and cons of each area it is examining.  

Mr. Kropelin presented a report on and notes of a meeting of the Forest Health Subcommittee with representatives of the Vermont Department of Fish and Wildlife (DFW). That meeting included discussion of the voluntary guidelines appended to the Working Group’s January 2011 interim report. He reported that the meeting included discussion of: DFW’s belief it has insufficient personnel to oversee and monitor implementation of guidelines; the possible use of biomass “brokers” to provide certification for smaller entities; whether there should be retention of biomass residue beyond what the guidelines currently recommend; and creation of a web
document that complies sustainable forestry practices. The Working Group discussed the matters addressed in Mr. Kropelin’s report.

Counsel Adler provided the committee with a memorandum on verification mechanisms previously requested by the co-chairs and reviewed the memorandum.

The Working Group adjourned its meeting at approximately 4:15 p.m. The next meeting of the Working Group is October 6, 2011 in Room 10 at the State House in Montpelier.
BioE: Biomass Energy Development Working Group
MINUTES for Thursday, October 6, 2011
1:00 p.m. – 4:15 p.m.
Room 10, State House
Montpelier, Vermont

Members Present: Sen. Ginny Lyons (co-chair), Deputy Sec. Chris Recchia (co-chair), Paul Cate, Jamey Fidel, Bill Kropelin, Rep. John Malcolm, Sam Miller, Robert Turner

Absent: Chris Brooks, Rocky Bunnell, Ehrhard Frost, Bill Keeton, George Nagle, Adam Sherman

Staff Present: Aaron Adler (Legislative Counsel), Agatha Kessler (Committee Assistance)

MINUTES:

On motion of Mr. Kropelin, the Working Group approved the minutes of its meeting of Sep. 15, 2011.

Mr. Miller summarized the interim report of the Enhancement and Development Subcommittee provided at the meeting of September 15 and the Working Group engaged in further discussion of that report. Changes requested by the Working Group included incorporating discussions of: (a) the need for thermal efficiency and an associated funding mechanism; and (b) the pros and cons of each of the areas for enhancement that the subcommittee is examining.

Mr. Kropelin presented a report of the Forest Health Subcommittee and written comments by Mr. Frost on the report. The Working Group discussed matters addressed in the report. Changes requested by the Working Group included clarifications related to the voluntary guidelines in the report, its discussion of model procurement standards, and the potential incorporation of language regarding greenhouse gases.

Mr. Turner presented a draft final report section on modeling issues.

The co-chairs requested that the subcommittees send revised reports based on the meeting discussion to legislative counsel by Friday Oct. 14, 2011. Recommendations in the revised reports should be flagged as recommendations. Legislative counsel will integrate the revised reports with the 2011 interim report into one draft document for the Working Group’s review, with changes from the interim report marked.

The Working Group adjourned its meeting at approximately 4:15 p.m. The next meeting of the Working Group is October 27, 2011 in Room 10 at the State House in Montpelier.
Appendix G. Biomass Energy Development Working Group
Summary of Comments, Public Hearing

This document is a summary of comments received by the Biomass Energy Development Working Group (the Working Group) during its public hearing in Randolph, Vermont on December 6, 2011.

[To be completed]
Appendix I: List of Recommendations, Biomass Energy Development Working Group

For ease of reference, this document lists the recommendations of the Working Group contained in the body of its report, divided into each of the report’s three main areas. It is not a substitute for a complete review of the report.

A. Monitoring

1. The Vermont Dept. of Forest Parks and Recreation (DFPR) should complete a harvesting impact study similar to that completed in 1990.

2. The legislature should ensure that funding continues to provide for DFPR staff to review and analyze new releases of Forest Inventory and Analysis (FIA) data.

3. The legislature encourage research particularly on economic aspects of biomass harvesting. This research should target economic benefits and impacts for different scale projects; constraints to development, including financing and workforce issues; and the general responsiveness of the industry to increases in fossil fuel prices or increases in product demand as society moves towards a greater reliance on biomass for energy.

4. A review of the coordination and execution of existing publically funded monitoring programs (see Appendix B) should be conducted to: a) identify overlaps and gaps, b) review the adequacy of staff and funding, and c) examine how data are made available to the legislature and other policy or public groups for integration and analysis. Ideally, this review would include recommendations for improving existing programs and augmenting them in appropriate ways as the need and resources become available.

5. The state should continue to explore the potential of woody and non-woody agricultural biomass.

B. Enhancement and Development

6. Enhancement of Vermont’s biomass industry should come in the form of incentives that maximize the benefits and minimize negative impacts. Such incentives could include tax credits, low-interest loans, favorable power rates, and renewable energy credits.

7. Considerations relevant to enhancement and development of woody biomass energy, and to awarding incentives for such development, include but are not limited to:
   a. Efficiency and resource sustainability – the enhancement and development of the woody biomass energy industry in Vermont should attempt to use the available resource sustainably, in a manner that maximizes efficiency while meeting energy goals and focus on sectors of growth where the use of biomass can have beneficial localized impact on our energy reliability, security, and cost, and other public benefits.
b. Job creation – both direct and indirect. Job creation would be a major driver of the local Vermont economy.

c. Property tax generation – the anticipated payment of property taxes should be a consideration when evaluating a proposed biomass business.

d. Development and maintenance of the Vermont timber harvesting infrastructure – providing market growth and stability is a necessary component to a healthy rural economy. It is particularly important to encourage young entrants into the industry.

e. Year-round demand for biomass wood – as the pulp industry fades, it is necessary to encourage businesses that can contribute to new market for low grade wood and replace fossil heating fuels.

f. Value added to products produced – the value of the end product should be considered in the evaluation process. A manufactured product may have more value than a raw commodity.

g. Factors affecting the environment and human health – emissions, forest health, water quality, waste disposal and by-products must be considered in the evaluation process.

h. The local economy – the expenditure and retention of dollars with the local and Vermont economy vs. payment for out-of-state fossil fuels should be factored into the evaluation.

i. Timber stand improvement and markets to use of diseased and damaged timber – timber stand owners need markets for diseased and damaged timber.

8. The legislature should assign major priority to home heating with wood. In particular, tax policies advantageous to solar and wind projects should be extended to biomass consumers. Such tax advantages would be applied to the purchase of efficient heating stoves, furnaces, and boilers, and to district heating.

9. This wood home heating initiative should be part of a larger undertaking to support thermal energy efficiency. Funding will be needed to help achieve these goals, and examples of funding sources would include a charge on energy inefficiency or a tax on home heating fuels. Some portion of the funds raised could support residential heating with efficient woody biomass appliances.

10. The state should support new wood pellet manufacturing facilities in Vermont that are dispersed among various areas around the state. Project developers should be provided with information and guidance regarding the state’s regulatory process.

11. The General Assembly should require all pellets sold in Vermont to label their product as to moisture content, weight, list of ingredients, and suitability for various heating systems.

12. The state should create an effective outreach program to inform potential candidates for commercial/industrial and thermal-led combined heat and power (CHP applications), including compiling a complete list of potential sites (such as locations where a thermal load uses extensive amounts of heating oil or propane), analyzing existing programs and organizations that reach out to potential biomass users, producing a comprehensive information package explaining biomass energy,
highlighting successful wood conversion projects, and containing information regarding how to begin and negotiate the state regulatory process.

13. The state should support and enhance the biomass supply chain around Vermont, based on a business model under which suppliers provides woody biomass products to a variety of markets on a year-round basis.

14. The General Assembly should enact enabling legislation that allows municipalities to create and operate heating district utilities.

15. As soon as feasible, the General Assembly should lift the current suspension on applications for state aid for school construction at least for the purpose of supporting school conversions to woody biomass energy.

16. The Clean Energy Development Board, in consultation with the Department of Public Service (DPS), should develop recommended incentives for woody biomass thermal energy that use a tiered structure that rewards greater design system efficiency with a larger incentive in comparison to less efficient systems.

17. Services and permitting provided or required by the state should be centralized to facilitate the industry.

18. The state should develop model approaches to issues that can add delay to permitting a project if not handled in an appropriate way, such as procurement standards, forest health issues, air quality requirements, and other issues that are important to the affected public.

19. The Public Service Board (PSB) should improve its Section 248 application process to increase predictability and reduce processing time. The PSB could and should create a form applicable to larger energy projects. The PSB also should consider the assignment of a person or persons who can assist the applicant in completing the application form in the same manner as Act 250 coordinators do today.

20. The PSB, in its Section 248 proceedings, should require that each woody biomass energy facility be designed for the optimum design system efficiency. Woody biomass energy projects that are not subject to Section 248 review should also be required to meet this standard if they are subject to other siting or land use proceedings such as Act 250 or local land use review.

21. CHP is recommended for all new electric generation plants using woody biomass.

22. Economic incentive programs for biomass energy development should incorporate strong fuel efficiency standards. The state should maintain the existing “standard offer” program’s requirement of 50 percent design system efficiency for woody biomass generation. For incentive programs other than the standard offer, as an alternative to a flat requirement of 50 percent for design system efficiency, the DPS in consultation with the Clean Energy Development Board should consider a tiered structure for incentives for woody biomass electric generation plants that would reward greater efficiency.

23. Additional biomass energy-related manufacturing facilities should be sited in locations for which the combination of benefits and supporting resources is most appropriate, whether the manufactured product is pellets, electricity, or another
biomass energy product. Location that would facilitate use of excess heating capacity should be encouraged.

24. The state should support policies which accommodate growth of the public’s use of low-grade roundwood for home heating, particularly from local sources.

25. ANR should enlist a panel of experts to provide guidance on actual field performance versus lab tests on wood-burning appliances as to emissions levels, particularly in view of the Environmental Protection Agency’s (EPA) recent decision to only require infrequent “tuning” of small boilers as opposed to numeric emissions limits. The legislature should be aware of potential environmental and human health impacts of each class of biomass appliance so as to make fully-informed decisions regarding incentives and regulations for use.

26. ANR should compile and provide information to the legislature on emissions output under “field conditions” for wood-burning appliances that lack federal or state mandated numeric emissions levels in order to prioritize incentives or develop regulations.

C. Forest Health

27. The General Assembly should create a uniform system for implementing wood procurement standards across a range of facilities, including electricity generators, district heating, combined power and heat, pellet manufacturers, schools and office building complexes that heat with wood.

28. A model wood procurement standard adaptable to all scales of biomass users except individual firewood procurement should be developed. This standard should have the attributes discussed in the body of the Working Group’s report.

29. The legislature should add up to two positions at the Agency of Natural Resources (ANR) with backgrounds in wildlife biology, ecology, or forestry, located in the vicinity of wood procurement activities of any major new biomass demand for the purpose of providing consistent and timely review and guidance in the identification and protection of rare, threatened, endangered species, wetlands, deer wintering areas and rare natural communities. Funding for staffing increases should be borne by resource consumers in the form of a fee assessed on wood consumption for all wood consumers procuring over 50 green tons per year.

30. A compliance system must accompany implementation and enforcement of procurement policies for facilities that do not require a Section 248 or Act 250 permit. For example, a compliance officer housed with the Agency of Natural Resources (ANR) could oversee the implementation of wood procurement policies for school or district heating projects or wood pellet facilities not subject to Section 248 or Act 250 oversight.

31. Existing and future biomass users should adopt the voluntary harvesting guidelines contained in Appendix A to this report.
32. The state should develop a means for monitoring a representative sample of harvest operations for wildlife tree and biomass retention levels, and review or amend the voluntary harvesting guidelines periodically as necessary and as funding allows.

33. At least every 10 years, DFPR should reassess the use and adequacy of acceptable management practices (AMPs) on all types of wood harvests and strengthen them if warranted.

34. The state should pursue the development and adoption of regional biomass harvesting standards.

35. The state should closely follow the development of issues relating to carbon accounting for woody biomass and should initiate a process, working with key stakeholders including the ANR, DPS, the University of Vermont (UVM), and others, to research and officially adopt greenhouse gas accounting protocols relevant to wood bioenergy.

36. The state should explore in detail the concerns related to short-rotation woody crops (SRWC) listed by the Working Group in the body of this report. The state, the U.S. Natural Resources Conservation Service (NRCS) or UVM should monitor the rate of establishment of short-rotation woody crops and every 10 years assess the need for voluntary or regulatory controls of SRWCs.

37. The State of Vermont should provide training opportunities for foresters, landowner, and loggers in the use of the state Geographic Information System (GIS) database to identify/protect biodiversity elements of the forest. We recommend that information on the state GIS database be enhanced to include a full description of species and community attributes, their location, and recommended protection and enhancement practices similar to existing management guidelines for deer wintering areas.

38. There should be educational opportunities for foresters and loggers on the benefits and trade-offs on reducing tree utilization and increasing post-harvest woody debris. A simple means to estimate residue levels is needed for use in the field. The University of Vermont (UVM), the Forest Guild the Vermont Woodlands Association and the Vermont Forest Products Association (VFPA) are potential providers.

39. Educational opportunities on forest practices should include public-private partnerships that sponsor seminars or conferences for loggers and other forest product users in various regions within the state.

40. A sustainable harvesting manual should be developed, similar to “Good Forestry in the Granite State,” to be used as a tool for increasing the awareness of landowners, foresters, and loggers of desirable practices. Possible sources are UVM, DFPR, or USFS.

41. The state should continue to monitor rates of forestland gain or loss, as well as the harvest and growth of timber including unutilized low quality wood. Monitoring tools include United State Forest Service (USFS) Forest Inventory and Analysis data, Vermont Wood Harvest Report, Vermont Fuel Wood Study as well as the Biomass Energy Resource Center (BERC) Wood Supply Model or other wood supply models.
42. The state should sample monitor harvest operations for residual woody biomass and wildlife tree retention as part of use value appraisal (UVA) inspections or by other cost-effective means.

43. ANR should determine if there is a need for, and if warranted resume, inspections of biomass harvests as done in the 1980s.

44. The state or an industry group should compile a list of sources of chunk firewood, along with credentials of sustainable harvesting training, from whom the public and institutions could order sustainably-harvested wood. Suggested credentials include Logger Education to Advance Professionalism (LEAP) training or Master Logger Certification.

45. The state, Renewable Energy Vermont or VFPA should develop and distribute to the public information explaining the difference between "dry", "seasoned" and "green" firewood.