

# Montana Biomass

Environmental Quality Council

September 10-11, 2009

Using the draft work plan tasks for House Joint Resolution No. 1, approved by the Environmental Quality Council, as a guideline, a discussion of other state activities in the area of biomass and a snapshot of biomass projects and proposals in Montana are outlined below. A brief review of federal legislation that is being contemplated by Congress, which may have a significant impact on biomass projects in Montana, is also included.

## I. Recent recommendations

In May, several state agencies and the Western Governors' Association hosted the Montana Bioenergy Workshop in Missoula. The program was funded with support provided by the U.S. Department of Energy, U.S. Department of Labor and the Energy Foundation. At the conclusion of the program, participants used the information provided to develop a series of recommendations to both Governor Schweitzer and the Montana Legislature.

Those recommendations may serve as a useful starting point for the EQC as it begins its in-depth review of biomass in Montana. The recommendations listed below are directly from the group and considered to be action items of the highest priority:

- Governor Schweitzer should promote forest management to mitigate wildfire, insects and disease on both a state and national level. Access to federal land is a significant barrier in northwestern

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- Montana, but will ensure forests' survival and provide a reliable, firm source of renewable energy and reduce our carbon footprint. The scale and shape of bioenergy development must match the amount of material produced through environmentally sound, sustainable land management.
- Collaboratively developed proposals for active management on Montana's National Forests, such as the Beaverhead-Deerlodge Partnership and Blackfoot Clearwater Stewardship Proposals, should be legislatively authorized. It is recommended the Governor support these proposals and the continuation of Stewardship Contracting Authority, which allow National Forests to bundle restoration projects with revenue-generating timber projects, reducing dependency on appropriated dollars. Current authorization for Stewardship Contracting will expire in two years.
- The scale of cellulosic ethanol plants eligible for federal support should be revised to include smaller scale facilities. These projects can be smaller to remain sustainable and avoid excessive haul distances, but can still be cost effective.

- The state should coordinate cooperative grant applications to consolidate individual, small-scale efforts in order to reach the large scale required by federal programs. Doing so will be essential to continued rural development in Montana.

Development of a statewide, interagency bioenergy strategic plan to facilitate the development of bioenergy is recommended. This plan would:

- Quantify the state's biofuel potential resources and consider competing uses.
- Develop methods of enhancing supply assurance such as long-term contracts on state trust lands and/or assurance of supply in lieu of a tax credit and/or piloting projects.
- Recommend policies that account for the state's feedstock variability.
- Identify cross-agency issues and opportunities to streamline the permitting process associated with new bio-energy projects.
- Take advantage of existing infrastructure such as existing transmission lines and opportunities for combined heat and power projects.
- Promote biomass by co-firing wood or agricultural residue at existing energy generating facilities where technically feasible.
- Lead by example. With the 8,000 flex fuel vehicles as part of its fleet, the state can require that the vehicles that are capable of running on E85 do so when practical.

The group also recommends revisiting biomass incentives in Montana. Critical steps that need to be considered when structuring incentives for bioenergy include hauling, blending, producing, and the growing of feedstocks.

- Determine the potential import and export market for bioenergy and its byproducts. A study of the potentials would assist this industry.
- Account for water laws and potential restrictions.
- Various methods of supply assurance from long-term contracts on state trust land to assurance of state biomass supply in lieu of tax credits.
- The state should examine existing infrastructure for additional opportunities for combined heat and power (CHP) projects. This would include community level distribution and require setting a proper value for the heat product.
- The state Renewable Portfolio Standard should be revised to recognize and allow that the cost of renewable power will be higher in the short run than traditional sources. Steps to encourage distributed generation would also encourage the development of rural and small scale biomass projects.

Following up on the recommendations, an informal biomass working group has organized to look at biomass issues and advise the Department of Natural Resources and the state forester. (The DNRC formed a similar work group several years ago, but ended the program due to lack of participation.) The group includes the Department of Environmental Quality, Department of Commerce, federal agencies, industry representatives, conservation organizations, and tribal representatives. There has been a great deal of interest in the group, and participation is increasing.

## **II. Biomass Incentives in Other States**

States have implemented a number of policies and incentives in recent years to encourage the use of biomass. This includes broader efforts related to renewable energy sources, forest management, and energy conservation and policies specifically tailored to biomass. Those policies aim to improve local utilization, to reduce costs associated with harvesting, handling, and transporting biomass, and to develop manufacturing and consumer markets.

Approaches used by states range from transportation credits paid on the volume of wood chips transported to an energy plant, to reduction in vehicle tags and taxes, and consumer credits for purchase of biomass products.<sup>1</sup> There are cost-share, grant, loan, rebate, and training programs, as well as various tax credits ranging from reduction of or exemption from sales tax to deductions or exemptions from corporate, production, personal, and property taxes.

Oregon's tax credit is hailed by Bill Carlson of Carlson Small Power Consultants as the best state tax incentive because a number of different entities may use the credit. Carlson is involved with the development of several biomass-fueled projects at forest product sites across the Western United States. He has conducted biomass feasibility studies for several sawmills in Montana and spoke at the Montana Bioenergy Workshop in Missoula.

The following is a categorized review of other states' incentives as compiled from the National Conference of State Legislatures and "State Woody Biomass Utilization Policies," published in December 2008 by Dennis R. Becker and Christine Lee at the University of Minnesota.

### **Tax Incentives**

#### **Oregon**

Enacted in 2007, Oregon provides business tax credits to support the production, collection, and use of biomass and biofuels. The program is administered through an income tax credit for producers and collectors of Oregon-sourced biomass or energy crops based upon volume. Producers of neat ethanol or pure bio-oils from Oregon feedstock are also eligible.

#### **Credit Amount:**

- oil seed crops, \$0.05 per pound
- grain crops, including but not limited to wheat, barley and triticale, \$0.90 per bushel (grains do not include corn; wheat became eligible January 1, 2009)
- virgin oil or alcohol \$0.10 per gallon
- used cooking oil or waste grease, \$0.10 per gallon
- wastewater biosolids, \$10.00 per wet ton
- woody biomass collected from nursery, orchard, agricultural, forest or rangeland property, including but not limited to pruning, thinning, plantation rotations, log landing or slash resulting from harvest or forest health stewardship, \$10.00 per green ton

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<sup>1</sup>State Woody Biomass Utilization Policies, University of Minnesota, College of Food, Agricultural and Natural Resource Sciences, Department of Forest Resources, Becker, Dennis R. and Christine Lee, December 2008.

- grass, wheat, straw or other vegetative biomass from agricultural crops, \$10.00 per green ton
- yard debris and municipally generated food waste, \$5.00 per wet ton
- animal manure or rendering offal, \$5.00 per wet ton

**Who's Eligible:**

An agricultural producer or a biomass collector operating as a trade or business that pays taxes for a business site. The business, its partners, or its shareholders may use the credit. The applicant must be the producer or collector of the biomass in Oregon that is delivered to a bioenergy facility in Oregon for use as a energy fuel. An agricultural producer means a person that produces biomass that is used in Oregon as biofuel or to produce biofuel. A biomass collector means a person that collects biomass to be used in Oregon as biofuel or to produce biofuel. The producer or collector also can be an Oregon non-profit organization, tribe or public entity that partners with an Oregon business or resident who has an Oregon tax liability.

**Arkansas**

HB 2256 (2009) exempts biomass primarily used for biofuels production from the state's natural resources severance tax. For example, timber is otherwise taxed 17.8 cents per ton for pine and 12.5 cents per ton for all other timber.

**California**

In 2007, California exempted fuel used to transport biomass from state sales and use tax.

**Idaho**

Under the Biofuel Fueling Infrastructure Tax Credit (2007), qualified biofuel fueling infrastructure is eligible for a credit of up to 6% of the qualified investment against the corporate income tax. The allowable credit cannot exceed 50% of the income tax liability of the taxpayer.

**Kentucky**

The Railroad Expansion Tax Credit (2009) provides a tax credit worth 25% (up to \$1 million) of the cost incurred by corporations or railway companies to expand or upgrade rail facilities to transport biomass resources.

**Mississippi**

S 3278 (2009) provides that an enterprise owning or operating a facility producing electricity through the firing or cofiring of biomass is allowed an annual investment tax credit equal to 5% of investments made by the enterprise in the initial establishment of an eligible facility. Any tax credit claimed but not used in any taxable year may be carried forward for five consecutive years from the close of the tax year in which the credits were earned. The credit that may be utilized in a tax year is limited to an amount not greater than 50% of the total state income tax liability of the enterprise for that year generated by, or arising from, the facility.

**New Mexico**

- **Renewable Energy Production Tax Credit (enacted 2002, amended 2007)** - originally provided a tax credit against corporate income taxes of one cent per kilowatt-hour (\$0.01/kWh) for companies that generate electricity from wind or biomass. The credit may be applied annually to the first 400,000 MWh of each year for 10 years (i.e.\$4,000,000/year). The Renewable Energy Production Tax Credit was extended in

2007 to apply to personal income taxes for companies that generate electricity from wind or biomass using the same formula for corporate income taxes. Total generation from both the corporate and personal tax credit programs combined must not exceed two million megawatt-hours of production annually.

- **Biomass Equipment and Materials Deduction (2005)** - allows businesses to deduct the value of biomass equipment and biomass materials used for the processing of biopower, biofuels, or biobased products when determining the Compensating Tax due. The rate is 5% of the value of the property or service. Compensating Tax is designed to protect New Mexico businesses from unfair competition from out-of-state business not subject to a sales or gross receipts tax. This biomass Compensating Tax deduction is analogous to a sales tax exemption for renewable energy equipment available in some other states.
- **Alternative Energy Manufacturer's Tax Credit (2006)** allows manufacturers of alternative energy products and components to receive a tax rebate. The credit is limited to 5% of the taxpayer's qualified expenditures, such as manufacturing equipment. Any remaining portion of the tax credit can be carried forward for up to 5 years.

### **South Carolina**

The Biomass Energy Production Incentive (2007) is part of South Carolina's Energy Freedom and Rural Development Act, which provides production incentives for certain biomass-energy facilities. Eligible systems earn \$.01 per kilowatt-hour (kWh) for electricity generated and \$.30 per therm (100,000 Btu) for energy produced from biomass resources. The incentive payment for the production of electricity or thermal energy may not be claimed for both electricity and energy produced from the same biomass resource. The incentive payment may be claimed as a tax credit or received in cash.

### **Other Monetary Incentives**

#### **Alabama**

The Biomass Energy Program (Alabama Department of Economic and Community Affairs) assists businesses in installing biomass energy systems. Program participants receive up to \$75,000 in interest subsidy payments to help defray the interest expense on loans to install approved biomass projects. Technical assistance is also available through the program.

#### **Colorado**

Community Biomass for Thermal Usage Program (Governor's Energy Office) - \$100,000 has been allocated for this program from the Colorado Clean Energy Fund. The purpose of this partnership program is to provide financial support for biomass-heating projects that utilize community-based biomass sources. Financial support from multiple stakeholders must be committed before a project can receive additional funding through the program. Priority given to projects that use community produced wood chips or Colorado manufactured pellets. High-priority is given to projects that "include supply from fuel reduction, restoration activities, local collection sites, and/or projects that demonstrate long term availability of biomass supply."

#### **Florida**

The Farm to Fuel Grants Program (2007) provides matching grants for demonstration, commercialization, research and development projects related to bioenergy. As part of the

program, the Legislature appropriated \$25 million in matching grants. It is intended to stimulate investment in energy projects that produce bioenergy from Florida-grown crops or biomass.

### **Idaho**

The Biofuels Infrastructure Grant (2007) provides grants for up to 50% of the cost of the project for retail fuel dealers who choose to invest in qualified fueling infrastructure projects dedicated to providing biofuels to customers. Funds can be used for installing new fueling infrastructure or for upgrading existing infrastructure documented as being incompatible with biofuels, including cleaning existing storage tanks.

### **Illinois**

The Biogas and Biomass to Energy Grant Program (1997) focuses on demonstrating the use of biogas and biomass for on-site energy generation at facilities in Illinois. The biogas and biomass grant program will provide a 50% cost-share for energy feasibility studies or for the installation of equipment for these purposes.

### **Vermont**

Biomass Electricity Production Incentive (2004, non-legislative) - Central Vermont Public Service Corporation (CVPS), Vermont's largest electric utility, offers a production incentive to farmers who own systems utilizing anaerobic digestion of agricultural products, byproducts or wastes to generate electricity. CVPS purchases electricity and renewable energy credits at 95% of the Locational Marginal Price of generation published by ISO New England (roughly avoided cost), plus an additional \$0.04 per kWh. CVPS sells the renewable energy credits generated under this arrangement as part of CVPS Cow Power, the utility's green power program. This program offers customers the opportunity to purchase renewable energy for \$0.04 per kWh above the retail cost of electricity.

### **Virginia**

Code Section 45.1-394 (2009) provides that a producer of at least one million gallons of "advanced" biofuels derived from renewable biomass or algae may receive a production incentive grant equal to \$0.125/gallon sold in the calendar year (equals at least \$125,000/year).

## **Non-monetary Policies/Incentives**

### **California**

Biofuels Production Mandate and Alternative Fuel Use Study (Executive Order S-06-06): California plans to use biomass resources to provide transportation fuels and electricity to satisfy California's fuel and energy needs. To increase the use of biomass in fuel production, the state will produce its own biofuels at a minimum of 20% by 2010, 40% by 2020, and 75% by 2050. The Bioenergy Action Plan includes: research and development of commercially viable biofuels production and advanced biomass conversion technologies; evaluation of the potential for biofuels to provide a clean, renewable source for hydrogen fuel; and increases the purchase of flexible-fuel vehicles to 50% of total new vehicles purchased by state agencies by 2010.

### **North Carolina**

Biomass Market Development for North Carolina (2005) - The State Energy Office (SEO) will facilitate permanent establishment of the North Carolina Biomass Council (NCBC)

through a subcontract with the North Carolina Solar Center (NCSC). The Council will provide consultation to the North Carolina Energy Policy Council, the SEO, and the North Carolina General Assembly on implementation of bioenergy studies and demonstration projects through the establishment of a biomass deployment roadmap for North Carolina. A biomass waste exchange website will be created, launched, and marketed, dedicated to listing and trading biomass wastes and other biomass products.<sup>2</sup>

### **Virginia**

- **Code Section 15.2-2288.01 (2009)** provides that local governing bodies may not require a special use permit for certain small-scale conversion of biomass to alternative fuel if at least 50% of the feedstock is produced either on site or by the owner of the conversion equipment, the structure used to process the feedstock occupies less than 4,000 square feet, not including space for feedstock storage, and the owner of the farm notifies the administrative head of the locality in which the processing occurs.
- **Code Section 10.1-1308.1 (2009)** provides that a proposed "qualified energy generator" that would generate or produce no more than five megawatts of electricity from biomass must receive an expedited permitting process from the Air Pollution Control Board not to exceed 60 days. The permit application fee may not exceed \$50.

### **III. Biomass Projects in Montana**

Biomass includes both forest and agricultural residues -- both are prevalent in Montana. Biomass can be a feedstock for both electricity and fuel -- both opportunities are viable and being explored in Montana. HJR 1 notes that biomass for liquid fuel and electricity are options worthy of discussion and review. The focus of the EQC's biomass study, however, largely revolves around the word "residues" or looking at opportunities to use materials that are leftover or not fully utilized. The information below does not include oilseed crushing facilities or operations that use annual crops as feedstock in Montana but instead focuses on projects that are utilizing woody biomass or agricultural residues, like straw and corn stalks.

Woody biomass users in Montana consume about 2.2 to 2.7 million dry tons of woody biomass a year, largely using mill residue to fuel the supply. Biomass users include 10 bark or wood pellet plants, Fuels for Schools facilities, two board facilities, and one pulp mill. A single facility, Smurfit-Stone Container Corp., accounts for more than one-half of the total annual biomass consumption in Montana.<sup>3</sup>

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<sup>2</sup>According to North Carolina Department of Commerce Energy Office Renewable Program Manager Bob Leker, the agency was unable to effectively sustain an exclusive biomass waste exchange website. Biomass exchange is now included in a separate website for plain waste exchange.

<sup>3</sup>"An Assessment of Forest-based Woody Biomass, Supply and Use in Montana," Todd Morgan, Bureau of Business and Economic Research, University of Montana, April 2009, page 18.

**Fuels for Schools Projects**

The Montana Fuels for Schools and Beyond Program promotes the use of forest biomass waste for energy in public buildings -- public schools in particular. It is a collaboration between the Montana Department of Natural Resources and Conservation, the U.S. Forest Service, and Montana Resource Conservation and Development Areas. The 2001 National Fire Plan included grant money for pilot projects to demonstrate new methods of using small diameter and under-utilized woody biomass and to facilitate development of technologies that use biomass. Funding for Fuels for Schools started in the fall of 2002. A breakdown of federal and general fund money used for the program is included in **Figure 1**.

The Fuels for Schools program works in three phases, with the end goal of using government grant money to make biomass a viable option.<sup>4</sup> The first phase is demonstration. For example, Darby Schools received the first system and was funded at a high level (100%). Dozens of tours were provided at the facility, and managers experimented with a various fuels to gather information on improving the system. Additional demonstration projects were completed at Thompson Falls, Philipsburg, and Victor schools. In 2005, grants were awarded to demonstrate different applications of biomass heat. A maximum of \$400,000 or 50% of construction and installation was provided. This led to the University of Montana - Western in Dillon project and projects in Troy, Townsend and Kalispell.

**Figure 1**

*Source: Legislative Fiscal Division*

<b>Fuels for Schools</b>							
		<b>Expenditures</b>					
	<b>Fiscal Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Totals</b>
<b>Federal</b>	Admin/ Operating	\$34,436	\$42,601	\$4,207	\$43,197	\$68,709	\$193,150
	Grants	\$89,835	\$115,165	\$485,450	\$472,004	\$234,042	\$1,396,496
<b>General Fund</b>	Admin/ Operating	0	0	0	\$75,000	\$150,000	\$225,000
	Grants	0	0	0	\$100,000	\$175,000	\$275,000
<b>Total Expenditures</b>	Admin/ Operating	\$34,436	\$42,601	\$4,207	\$118,197	\$218,709	\$418,150
	Grants	\$89,835	\$115,165	\$485,657	\$572,004	\$409,042	\$1,671,496
		<b>\$124,271</b>	<b>\$157,766</b>	<b>\$489,657</b>	<b>\$690,201</b>	<b>\$627,751</b>	<b>\$2,089,646</b>

The \$1.4 million UM-Western project, for example, was funded with a \$400,000 grant

<sup>4</sup><http://dnrc.mt.gov/forestry/Assistance/Biomass/AboutProgram.asp>



administered by Headwaters RC&D. The DEQ State Energy Conservation Bond Program provided about \$1 million through a 15-year low-interest loan.<sup>5</sup> The university initially had a contract with Sun Mountain Lumber in Deer Lodge to provide wood chips for about \$3.25 per dekatherm, compared to the \$8.68 per dekatherm paid for natural gas.<sup>6</sup> (That contract has expired.)

The second phase of Fuels for Schools is expansion. In 2006, the DNRC offered a reduced level of support for projects, covering 25% to 35% . Eureka and Deer Lodge were recipients of those grants. Grants were used as an incentive to reduce the risks associated with adapting to an alternative system. The DNRC also is working to create "clusters or geographic groupings" of small biomass heating systems. Clustering can make the processing and delivery of wood fuel more economical and efficient. Using larger biomass projects for cogeneration of heat and power is also a concept explored through expansion. Finally, during the expansion phase the DNRC has systematically identified financial resources, beyond the Forest Service grants, to assist with biomass boiler installations. Funding includes resources such as rural development grants and no-low interest loans, carbon offset funding, performance contracting with energy service companies, private foundation grants and more.<sup>7</sup>

The DNRC is currently moving out of phase two and into phase three -- privatization. With this move, grants are no longer available. The DNRC instead offers its support in the form of technical advice. The agency is working with the private and public sectors to identify funding sources, complete fuel supply assessments, network, and determine project feasibility. Program officials indicated that they moved into this phase largely because of a lack of grant funding. The program is operating on federal carryover money that is expected to run out in the next two years. The program has used a combination of grants to complete projects, but has not yet successfully completed a project without grant dollars from the Fuels for Schools program.

More than 50 prefeasibility assessments have been completed by the DNRC since the project's inception. DNRC also has done an overview analysis of boilers throughout Montana to focus on the top conversion opportunities. If sufficient grant money was available, between 5 and 7 entities would likely initiate projects. The DNRC, to date, has not worked with entities interested in converting to biomass without grant support, because of the high up front costs associated with the systems and perceived risks associated with the technology.<sup>8</sup>

In Montana there are 10 Fuels for Schools projects, which have been funded in part with federal grant dollars. Projects are shown in **Figure 2**. The largest project is at UM Western and produces about 13 million BTUs an hour and uses 3,500 green tons of wood waste each year. The smallest system is in Troy, producing about 600,000 BTU's an hour.

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<sup>5</sup>Dillon Tribune, April 19, 2006, Page A-3.

<sup>6</sup>Ibid.

<sup>7</sup><http://dnrc.mt.gov/forestry/Assistance/Biomass/AboutProgram.asp>

<sup>8</sup>Information provided by Angela Farr, DNRC, June 12, 2009 meeting.

**Figure 2**

<b>Montana Fuels for Schools</b>							
<b>Facility</b>	<b>Square Footage</b>	<b>Project Cost</b>	<b>Peak Output BTU/hr</b>	<b>Annual Wood Fuel Use</b>	<b>Fuel Replaced</b>	<b>Estimate Annual Savings<sup>3</sup></b>	<b>Date of operation</b>
Darby Schools	82,000	\$650,000 <sup>1</sup>	3 million	760 tons	Fuel oil	\$90,000	11/03
Victor Schools	47,000 <sup>2</sup>	\$590,000	4.9 million	500 tons	Natural gas	\$27,000	9/04
Philipsburg Schools	99,000	\$697,000	5.1 million	400 tons	Natural gas	\$52,000	1/05
Thompson Falls Schools	60,500	\$455,000	1.6 million	400 tons	Fuel oil	\$60,000	10/05
Troy Schools	33,235	\$299,000	1 million	60 tons pellets	Fuel oil	\$12,500	11/07
Glacier High School	220,000	\$525,000	6 million	1,900 tons	New build	\$100,000	4/07
UM-Western	471,370	\$1.4 million	12 million	3,800 tons	Natural gas	\$118,000	2/07
Townsend Schools	120,000	\$425,000	680,000	250 tons pellets	Fuel oil, propane	\$19,000	3/07
Eureka Schools	178,000	\$1.3 million	4-5 million	960 tons	Fuel oil, propane	\$103,000	11/07
Deer Lodge Elementary	38,000	\$797,000	1.5 million	700 tons	Natural gas	\$48,000	10/08
MT State Prison <sup>4</sup>	40,000	\$990,000	3-5 million	1,000 tons	Natural gas	\$40,000	1/10
<b>MT Total</b>	<b>1.4 million</b>	<b>\$8.1 million</b>		<b>~12,750 green tons</b>		<b>\$669,500</b>	

*Information provided by DNRC*

<sup>1</sup> Projected numbers are provided for projects not yet completed. Darby cost excludes \$268,000 for repairs to the existing heat distribution system.

<sup>2</sup> Victor's boiler is sized to heat an additional 1,600 sq. ft that will be built in the future -- the tons consumed and savings are projected for the full heat load.

<sup>3</sup> Savings figures are based upon actual performance where available. Philipsburg's savings are estimated because they reduced the amount of heat required with additional weatherization.

<sup>4</sup> Project is underway.

## **Private Projects**

### ● **Smurfit-Stone Container Corp.**

Smurfit-Stone is an international company, with a plant in Frenchtown that is the biggest biomass energy user in Montana. The plant's main product is linerboard, which is a laminated paper stock used primarily in the manufacture of corrugated containers.

Using biomass, 15 to 17 megawatts of electricity are generated at the site. Smurfit's manufacturing process provides an overview of maximizing wood products using biomass boilers and also illustrates the complexity of the process.

- A debarked tree goes through the chipping process. The resulting chips go through a digester or pressure cooker, which separates lignin from the wood fiber.
- The fiber is refined to make paper, while the remaining chemicals and lignin then go through a process to extract the turpentine and oils.
- The remaining "black liquor" is then fed into a recovery boiler, where it is sprayed through a fire to produce steam. The fire burns away the lignin and the inorganic chemicals drop to the bottom to be recovered for reuse.
- Bark and residue from processed pulpwood are also a source of biomass fuel for boilers.
- Steam from the boilers powers turbines, provides heat and heats drums on the paper machines.<sup>9</sup>

Biomass consumption at the facility is about 948 green tons per day. The amount fluctuates based on season, moisture content, demand from the mill, and other factors. About 35% of the supply comes from internal sources, including during the chipping and a chip screening process. About 65% of the biomass that is utilized is purchased, with about 80% of that purchase coming from private landowner sources. Another 10% comes from DNRC, state lands and the final 10% is from Forest Service and Bureau of Land Management sources. Smurfit often travels as far as 200 miles away to procure materials.

### ● **AE Biofuels**

AE operates a cellulosic ethanol demonstration facility in Butte. The 9,000-square-foot commercial plant operates using feedstocks consisting of various grasses, wheat straw, corn, corn stalks, and sugar cane stalks. The \$1.5 million facility is capable of producing 150,000 gallons of ethanol a year.

The plant uses a patented "Ambient Temperature Enzymes" process to convert starch and cellulose into fermentable sugars.<sup>10</sup> The technology used by AE Biofuels reduces energy that is used by:

- Combining the starch-to-sugar and sugar-to-alcohol steps
- Combining cellulosic and starch inputs to lower feedstock costs during distillation
- Using ambient air temperatures
- Eliminating cooking and cooling mash, like that needed for corn

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<sup>9</sup>2007 Environmental & Social Responsibility Report, Smurfit-Stone Container Corp.

<sup>10</sup>[http://www.aebiofuels.com/butte\\_8\\_11\\_08.php](http://www.aebiofuels.com/butte_8_11_08.php)

- Reducing the cooling of fermentation.<sup>11</sup>

### **Projects proposed**

Throughout Montana there are a number of ongoing discussions about the development of biomass energy projects. Those discussions are in varying stages. Co-generation projects at Montana mills have been a major focus in biomass discussions, with specific projects as priorities, if the Montana DNRC had received stimulus money through the U.S. Forest Service to assist with combined heat and power projects. The DNRC did not receive that federal funding, however, discussions about co-generation projects continue.

The DNRC also has developed a map (**Map 1**) that shows insect (bark beetle) infestations in the state in proximity to Fuels for Schools projects and open and closed mills in Montana. The map is attached. The information below focuses on the projects that have received the most attention in the last couple years:

- **F.H. Stoltze Land and Lumber Co. in Columbia Falls**

Stoltze is investigating the development of up to 22- megawatts of generation capacity to replace the 100-year-old boilers at its Halfmoon sawmill. The co-generation plant would operate at about 12 megawatts an hour for half of the year, and at 18 megawatts for the other half.<sup>12</sup> Development of the facility would be a \$50 million investment and create about 13 jobs at the plant and 40 additional jobs for fuel collection, processing, and delivery. The cost of development is estimated at about \$2 million to \$3 million per megawatt for the plant.

The byproducts from the operation at the plant and the 38,000-acres owned by Stoltze in the Flathead Valley would serve as the source for the facility. Electricity could potentially be sold to NorthWestern Energy, Flathead Electric Cooperative, or Lincoln Electric Cooperative.<sup>13</sup>

Chuck Roady, vice president and general manager, said the proposal pursued by Stoltze is based on a fuel source analysis of utilizing by-products from the plant and from Stoltze timberlands, but did not include fuel from national forest lands. Roady indicated the biggest obstacle to developing the project is the price of power. "You need a power agreement and financing," he said. "And you need that power supply agreement before you can get financing."<sup>14</sup>

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<sup>11</sup>[http://www.aebiofuels.com/cellulosic\\_ethanol.php](http://www.aebiofuels.com/cellulosic_ethanol.php)

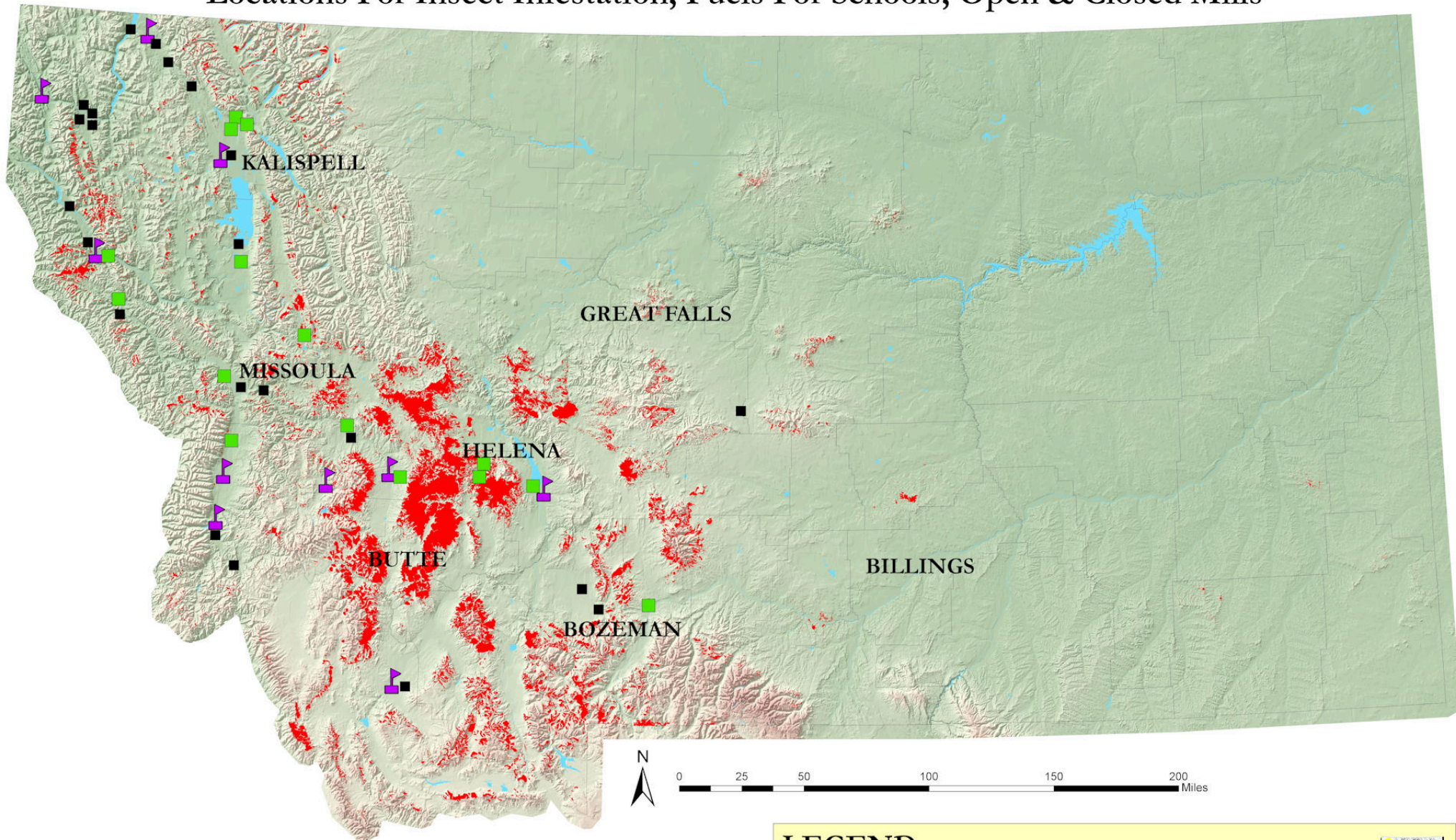
<sup>12</sup>Flathead Beacon, "Stoltze hopes to branch into alternative energy", Keriann Lynch, March 12, 2009.

<sup>13</sup> Hungry Horse News, "Stoltze seeks city support for co-gen plant", Heidi Desch, February 25, 2009.





<sup>14</sup>Interview with Chuck Roady, June 23, 2009.


# Bugs-Biomass-Mill Infrastructure

Locations For Insect Infestation, Fuels For Schools, Open & Closed Mills



**LEGEND**

	2008 Insect Survey		Currently Active Mill Sites
	Fuels for Schools Sites		Closed Mill Sites (since 1990)



- **Sun Mountain Lumber in Deer Lodge**

Sun Mountain is pursuing the development of 12-18 megawatts of generating capacity. This would be a \$30 million to \$50 million investment and create about 14 jobs at the plant and an 20 to 40 additional jobs for fuel collection, processing, and delivery. Using byproducts at the plant, Sun Mountain could generate about 15 megawatts -- as a general rule of thumb, it takes about 1 ton of biomass to generate 1 megawatt hour. Depending on chip prices, Sun Mountain also could get additional fiber from mills to the east and northeast.

Vast acres of beetle-kill in the area also could be a source for the facility. Nearby transmission lines and transportation corridors coupled with good air quality and development of the Mill Creek natural gas facility in nearby Anaconda are assets that increase the probability of development of the site.<sup>15</sup>

Sun Mountain is engaged in an ongoing discussion with NorthWestern Energy about developing the plant. Sherman Anderson, owner of Sun Mountain Lumber, indicated the greatest obstacle to developing the co-generation facility is the price of energy. "It's getting close, but it's just not at a point where we are willing to take the risk," Anderson said.<sup>16</sup> "It's kind of in limbo because of that -- but it is strictly market."

Sun Mountain also currently supplies about 730 tons a year of fiber wood to fuel the Fuels for Schools project in Deer Lodge.

- **The Blackfoot-Clearwater Stewardship Project**

This project includes a renewable energy component that would build a biomass boiler and cogeneration facility at Pyramid Mountain Lumber in Seeley Lake. The Blackfoot-Clearwater Stewardship Project is a proposal developed by a wide variety of individuals and organizations aimed at restoring and protecting the landscape and stimulating rural economies and communities located within the Blackfoot and Seeley Swan valleys.

The three-part proposal includes development of a \$7 million public-private partnership with Pyramid Mountain Lumber to build a biomass boiler and energy facility that would use slash removal and other wood from private, state, and federal forest lands.

The proposal includes \$3 million to cost-share for a new boiler (a 50/50 split) and \$4 million to cost-share for the cogeneration facility (a 75/25 split, with the federal government picking up 75% of the cost).<sup>17</sup> The 3.2 megawatt facility could add 20 to 30 jobs to the local economy.

Because of the project's relatively small size, nearly all of the power would be used by Pyramid Lumber, freeing up 3.2 megawatts that are currently purchased from Missoula Electric Cooperative. The plant would require about 100 tons a day of residuals, which could come from the mill. "But we would rather continue to sell off those products and utilize excess forest fuels as our feedstock for the facility," said Gordy Sanders, Pyramid's resource manager.

The biomass facility, is one of three components included in the proposed stewardship

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<sup>15</sup>Interview with Sherman Anderson, June 23, 2009.

<sup>16</sup>Ibid.

<sup>17</sup>Interview with Gordy Sanders, July 1, 2009.

project. The initiative, which would require Congressional approval and financial assistance, would develop new timber sales and forest management projects, certify wilderness areas, and establish travel trails. However, each of the three components are not interdependent and could move forward in different pieces of legislation.

### **State funding for potential projects**

The 2009 Legislature approved a \$475,000 appropriation in House Bill No. 645, the Montana Reinvestment Act, to the Department of Commerce to conduct a "biomass energy study". The funding may be used to fund feasibility studies, installation of biomass energy boilers, or biomass program staff within the Department of Natural Resources and Conservation in order to increase biomass utilization. Based on EQC's direction at the May meeting, the EQC wrote Commerce Director Anthony Preite a letter, encouraging the department to use the money for biomass pilot projects.

In late June, Governor Brian Schweitzer announced that the \$475,000 would be made available in the form of grants for biomass energy feasibility studies through the Department of Commerce. During the month of July, the department solicited grant request from applicants. Qualified applicants will be required to use the money to prepare feasibility studies focused on assessing the potential for the development of woody biomass generation plants in Montana.

The feasibility studies should include cost/benefit information to provide potential investors with sufficient information to determine the financial viability of a project, the potential public and private biomass supply in western Montana that could be used as feedstock, potential power that would be generated and transmission infrastructure, sustainability impacts, regulatory and permitting processes, National Environmental Policy Act and Montana Environmental Policy Act requirements, and a risk assessment. Private companies and consulting firms were invited to apply, and the Grant awards from \$100,000 to \$475,000 were offered.

The department received eight applications, with a review of the eight projects included in **Figure 3**. Grants are expected to be awarded before Labor Day. Prior to the mailing of this background report, awards had not yet been made. The EQC will receive a full update during the September 10-11 meeting from the Department of Commerce on the successful grant applicants and the status of the program.

**Figure 3:**

<b>Biomass applications</b>		
<b>Applicant</b>	<b>Project Description</b>	<b>\$ Request</b>
Redleaf Consulting, PLLC	Biomass generation facility consisting of a Brayton cycle engine equipped with a fluidized biomass combustor and turbo generator.	None specified
McKinstry	6-10 megawatt woody biomass generation facility for the City of Troy.	\$175,000
Porter Bench Energy, LLC	Multiple biomass plants in western Montana.	\$475,000
Stryker Wood Industries and Fuel Technologies	Plasma assisted gasification.	None specified
Montana Sustainable Building Systems	Cogeneration facility to provide heat and energy for a wood panel, beam, door and fiber insulation manufacturing facility to be located in Columbia Falls.	\$145,000
SouthEastern Montana Economic Development Corp. for ecoPHASER Energy	36 megawatt combined heat and power plus a 12 megawatt nonfirm power cogeneration facility at Ashland mill site.	\$100,000
Cooney Developments	Combined heat and power facility for the Bonner Mill Site.	\$128,000
NorthWestern Energy	Develop a business case for sustained biomass generation: A regional model for western Montana.	\$210,460
<b>Total*</b>		<b>\$1,233,460</b>

\*Two applicants did not specify a requested grant amount.



#### IV. Overview of Federal Activities

There are more than 30 bills before Congress that in some way deal with the issue of biomass. Those bills range from loans for cellulosic ethanol production technology development to amending the Clean Air Act to change and expand the current definition of renewable biomass. Below is a brief snapshot of federal legislation that has received significant attention in the past months.

- **Waxman Markey (H.R. 2454)** The version of the bill, approved by the House, is now in the Senate Environment and Public Works Committee. The bill does not currently include an eligible list of carbon offset projects or improvements to the biomass definition that several biomass supporters were seeking. In September Sen. Barbara Boxer (D-CA) and John Kerry (D-MA) are expected to introduce legislation that is similar to the HR 2454, but includes many changes to the cap and trade concept. "Recognition of the carbon neutrality of biomass is critical for our industry under a comprehensive cap and trade scheme as biomass-derived fuels will not count against the carbon emissions cap for regulated entities," according to the Biomass Thermal Energy Council, of which the Montana DNRC is a member.<sup>18</sup>
- **Appropriations** The Senate has approved a \$34.3 billion energy and water spending bill that funds the Energy Department, the Army Corps of Engineers' water projects, the Interior Department's Bureau of Reclamation, and several other independent agencies. The Senate bill provides almost \$27.4 billion for the Department of Energy. Differences between the H.R. 3183, approved in July, and the Senate version will be worked out in conference committee. The Senate version includes an amendment sponsored by Sen. Bernie Sanders (I-Vt.). It appropriates \$15 million into district energy and combined heat and power systems. The amendment authorizes technical assistance grants from the Department of Energy to a parties, including utilities, universities and local governments. The grants would be used for engineering and feasibility studies, design work, and analysis to overcome financial, permitting and other barriers.
- **H.R.622** To amend the Internal Revenue Code of 1986 to expand the credit for renewable electricity production to include electricity produced from biomass for on-site use. Sponsor: Rep. Michael Michaud; Latest Action: Referred to the House Ways and Means.
- **H.R.1111** To promote as a renewable energy source the use of biomass removed from forest lands in connection with hazardous fuel reduction projects on certain Federal land, and for other purposes. Sponsor: Rep. Denny Rehberg; Latest Action Referred to the House Energy and Commerce.
- **S. 1470** To sustain the economic development and recreational use of National Forest System land and other public land in the State of Montana, to add certain land to the National Wilderness Preservation System, to release certain wilderness study areas, to designate new areas for recreation, and for other purposes. Biomass provisions are included in Section 105 and require an extensive biomass feasibility study. Sponsor: Sen. Jon Tester; Latest Action: Referred to Senate Energy and Natural Resources.

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<sup>18</sup> <http://www.biomassthermal.org/>