State Strategies and Policies Related to Wood for Bioenergy

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Summary. The use of woody biomass as an energy feedstock is faced with significant opportunities and challenges. Some of the greatest opportunities are the capacity to generate locally produced energy, generate additional work opportunities for harvesters and loggers, provide more opportunities for commercial thinning, improve the health of forestlands, and create new jobs in the energy industry and achieve climate change mitigation goals.
State policy and incentives are frequently used to value the co-benefits and non-market benefits of biomass used for energy, such as reducing hazardous fuels in areas where current infrastructure and markets are inadequate. Policies promoting use of woody biomass that previously had little to no commercial value could have effects on current wood product markets, so understanding and considering these linkages is an important dimension of the sustainability discussion. Additional removal of material from forestland can also result in undesired impacts on the forest resource if accomplished in ways that do not sustain the forest resource. Policy measures create conditions that allow the market to determine the most efficient way to accomplish goals, and use of financial incentives allows a direct measure of impacts on prices. Both types of incentives need periodic review and adjustment as new information becomes available.

Keywords. [Forthcoming]

Individual states and groups of states have developed strategies and policies that provide a backdrop for the broad interest in bioenergy and sustainable forestry. In addition to the historical interest by the forestry sector and forest products industries, chemical, agricultural, energy and industrial sectors are interested in the potential for biomass to offset use of fossil fuels and help achieve energy and environmental goals. Furthermore, communities are interested in the potential for bioenergy to reduce woody materials in landfills, reduce fire risk, create local jobs, and provide options to achieve their Climate Action Plan goals.

State-level regulations complement federal policies. While federal support promotes nationwide efforts, state-level regulations reflect on state-specific conditions and adopt approaches deemed most appropriate for the circumstances prevalent in that state or region. For example, some states have more options for solar and wind energy, while other states have more options for energy from biomass. Portfolio standards set goals while allowing some flexibility in how the goal is achieved. Many states are using an integrated set of state regulations and goal to achieve direct and indirect benefits of bioenergy.

State efforts that apply to using wood for bioenergy can be generally categorized to include:

Financial Incentives:

- Grant/Loan Programs
- Tax Incentives (PTC)
- Industrial Recruitment Incentives

[1] [Forthcoming]
[2] [Forthcoming]

- Rebate Programs, and Bio-products Subsidies (SBC)

Policy Incentives (CAP):

- Production Incentives for Renewable Power Generation and Fuels (RPS, RFS, RFM)
- Green Power Purchasing/Aggregation Policies
- Utility Green Pricing Programs, Net Metering, etc.
- Green Building Standards
- Carbon Offsets or Credits for Emission Reductions

Technical Assistance and Outreach:

- Working Groups and Outreach Programs
- Biomass Supply Assessment
- Regional Feasibility Assessments
- Incentives for Research, Development and Deployment

Multi-state Initiatives

Groups of states have formed regional greenhouse gas emission and climate action initiatives to provide a regulated carbon market in the absence of national climate change regulations. In September of 2008 the Regional Greenhouse Gas Initiative (RGGI) in the northeast began trading, and the Western Climate Initiative (WCI) released its design recommendations. The Midwest Greenhouse Gas Reduction Accord was established in 2007. The Chesapeake Bay states of MD, VA, WV, PA, DE, and NY adopted a resolution to develop a regional next-generation biofuels production goal that includes a plan for market and facility development. along with best management practices necessary to support an environmentally sustainable biofuel feedstock (Chesapeake Bay Program).

Five Regional Biomass Partnerships were established in cooperation with the Department of Energy to help coordinate regional efforts to address bioenergy, but these have not received federal funding in recent years. Regional assessments of biopower and biofuels potential were conducted by the Western Governor's Association to identify potential contributions of forestry and urban woody biomass to renewable power and biofuels production in the seventeen western states by 2015 (Western Governor's Association 2006, 2008).

Incentives Used by States

Financial instruments that provide tax incentives, subsidies, loans, grants and rebates are the most widely used regulations to encourage the use of woody biomass as an energy feedstock. Policy instruments primarily involve mandatory renewable energy portfolios (RPS and RFS). Most regulations and incentives encompass a variety of renewable energies *(wind, solar, and geothermal)* and biomass feedstocks and only a few uniquely target woody biomass. Each tool is discussed below, followed by examples of how states are integrating across these tools to achieve direct and indirect benefits of bioenergy.

Biomass Supply Assessments

One of the primary considerations for investing in bioenergy facilities is economic availability and access to biomass feedstock. Many states have conducted biomass assessments that include

forest biomass along with urban wood waste, and some include mill residues. Assumptions are made about availability of woody material from forests considering land ownership, road access, terrain, forest resource management scenarios, and forest resource condition (such as hazardous fuels build-up or large scale insect outbreaks). Assumptions include cost of harvesting, transport and competition or compatibility with existing markets for woody materials. Assessments that include all of these dimensions provide the most useful supply curve information. Predicting supply each year over an extended timeframe such as the next 20-30 years is ideal for new investors, yet the most accurate assessment of available supply is more likely projections over the next 5 years for material that will actually be offered for sale (example is Coordinated Resource Offering Protocol (CROP) studies). Supply from adjacent states and import/export assumptions also influence supply projections. Biomass supply from non-industrial private land owners is the most difficult to predict because of the highly variable land ownership/management objectives and unknown timing of forest management actions.

Renewable Portfolio Standard (RPS)

Over half of the states require electric power generators to use a certain percentage of renewable energy by a certain date. Most states specifically include biomass as a defined category for qualifying renewable energy systems. However, the different definitions of qualifying biomass can cause confusion and limit sale of credit between states. Arizona also specifically gives credit to "thermal production" to encourage combined heat and power (CHP) systems, which provides efficient use biomass at a scale that also matches available feedstock. As of October 2008 twenty-eight states have mandatory RPS. Three states have adopted state-wide voluntary RPS.

State Climate Action Plans (CAP)

Many states have completed comprehensive Climate Action Plans, or are in the process of revising or developing one. The plans detail steps that the states can take to reduce their contribution to climate change. The process of developing a climate action plan can identify cost-effective opportunities to reduce greenhouse gas emissions that are relevant to the state. The individual characteristics of each state's economy, resource base, and political structure provide different opportunities for dealing with climate change. Climate Action Plans set targets for emissions reductions and provide incentives for cleaner technologies. Specific details for each state's Climate Action Plan can be found at The Pew Center on Global Climate Change. Over thirty states have adopted Climate Action Plans as of October 2008. State specific carbon registries and/or exchanges that include forestry are being developed in Missouri (CLEAR), Oregon (Forest Resource Trust), Georgia and California (Climate Action Registry).

Public Benefits Funds or Systems Benefit Charges (SBC)

Many states and the District of Columbia have implemented state-level programs developed through the electric utility restructuring process as a measure to assure continued support for renewable energy resources, energy efficiency initiatives, and low-income support programs. More than half of these specifically include funding for biomass projects, according to the Database of State Incentives for Renewable Energy (DSIRE).

Biofuels Production Incentives

A number of states have designed financial incentives for the production of ethanol and other biofuels. Several provide partial exemptions from state gasoline excise taxes

(separate from federal excise tax and exemption). The trend is toward producer credits to keep business promotion within the state. Twelve states have developed renewable fuels goals (RFS/RFM) (Table 1) and these often include support for research, development and deployment of advanced biofuels from cellulosic materials. Many states also include biofuels as an eligible technology under their state RPS.

Each state's policy includes a definition of qualified "wood biomass" and usually restrictions on "qualified" facilities such as size and technology employed. A definition of woody biomass is often used as a tool to determine the materials eligible to receive incentives or to be considered renewable energy feedstock, and frequently eligibility includes required certification or adherence to woody biomass best management practices in order to assure sustainable forestry. A more detailed compilation of state woody biomass utilization policies was recently compiled by the University of Minnesota (Becker et. al. 2008). One example of linking sustainable forestry and bioenergy is the state of Vermont requiring all woody biomass used in heating schools be from certified forests. Definitions can be used to limit competition over inputs with the wood products industry and ameliorate pressure on the forest resource. However, different definitions used by states can also limit the ability to trade renewable energy certificates generated from bieonergy between states.

State Examples of Integrated Policy (OR, NY, WI)

Three states that have Climate Action Plans, Biomass Assessments, and Renewable Portfolio Standards were selected to demonstrate how these policies, strategies and incentives can work together to address sustainable forestry and bioenergy.

Oregon

Oregon has a mixture of federal, state, industry and private forest lands and an existing forest products industry as a backdrop for expanding bioenergy from forests. Oregon has developed a comprehensive wood biomass supply assessment both at the state level and using a 5-year biomass availability analysis (CROP study) for central Oregon, and for an area that covers southern Oregon and northern California. The linkages to forest resource management and community interests are identified in community wildfire protection plans, and in the state economic development goals for rural communities. The state also has an active forest biomass working group that is helping to facilitate discussion across sectors who are interested in new uses of the available biomass resource. The group has produced a comprehensive analysis of forest biomass opportunities map that includes existing wood-based energy facilities and the power transmission grid. Oregon also has potential to build biorefineries to produce liquid biofuels that could use primarily woody biomass or a combination of biomass from agriculture, urban areas and forestry.

The Governor's Renewable Energy Working Group and Governor's Advisory Group on Global Warming include energy from biomass in their recommendations for achieving climate change mitigation (CAP) and renewable energy goals (RPS and RFM). The "Oregon Strategy for Greenhouse Gas Reduction" discusses the linkage between climate change preparation and the existing economy and to potential for new economic development, promotes biofuels use and production, and expands research on how climate change could affect expanded production of renewable power including bioenergy. Oregon House Bill 2200 authorized the State Forester to establish programs to market, register, transfer or sell forestry carbon offsets on behalf of state forestland beneficiaries, the Forest Resource Trust, and other non-federal forest landowners. The bill recognizes a wide range of forest management activities – those designed to protect our

environment as well as those designed to provide our wood products – as having the potential to give rise to forestry carbon offsets. The Forest Resource Trust also provides technical assistance to forest landowners to support goals of the state climate strategy. Along with Oregon's Forest Practices Act there are multiple complementary policies and strategies to guide bioenergy development in Oregon and provide for sustainable forestry.

Wisconsin

Wisconsin has a suite of policy, financial, outreach and technology programs focused on bioenergy from wood. The large number of private forest landowners, and the existence of pulp and paper industry provide the backdrop for expanding bioenergy from forests. A report on the existing and potential supply of woody biomass in Wisconsin, and the relationship between biomass production and forest health provides a valuable description of the ecological implications of more systematic biomass removal. Best management practices were developed that apply directly to biomass removal from forests. The Wisconsin Forest Sustainability Framework identifies criteria to maintain forest's contribution to the global carbon cycle, and energy production is included in the Wisconsin Statewide Forest Plan. The large number of private forest landowners with their individual management objectives makes outreach and technical support an important part of utilizing forest residues. Establishing well-sited and well-managed energy plantations are identified as important next step for achieving long-term sustainability of wood biomass supplies for energy.

The Wisconsin Strategy for Reducing Global Warming (CAP) identifies policy related to the forestry and agriculture sectors for increasing the availability and use of renewable biomass and biofuels for electricity, heat and transportation. Recommendations include creating an Energy Crop Reserve program for payments to landowners for growing energy crops, financial support to biomass producers for new equipment and technology, financial support to reduce risk and uncertainty for biomass producers, and support for biomass aggregators and infrastructure. The goal is to use solid/liqui/gas fuels derived from biomass to provide 15 percent of the energy needs of the state owned and occupied facilities by 2025. There are also incentives for school districts and counties to use bioenergy. Recommendations also promote rapid evaluation of new technology, promotion and outreach to educate about bioenergy, and support for developing advanced biomass, biofuel and related renewable energy degree programs at the state university system.

Wisconsin Energy Independence Fund is a $150 million 10-year initiative designed to support the development and commercialization of clean energy technologies in Wisconsin through grants and loans to businesses and researchers. Types of grants include grants for business and marketing, feasibility study grants, development grants, and implementation grants. The state's Renewable Portfolio Standard (RPS) includes biomass. The governor's Office of Energy Independence is supporting development of a Wisconsin Biomass Marketplace to provide a more organized way for biomass providers to interact with biomass purchasers through a Biomass Commodity Exchange. This is a novel approach that goes beyond electronic registry exchanges and broker businesses that are functioning in other states.

The University of Wisconsin hosts the Great Lakes Bioenergy Research Center, funded in part by the Department of Energy. The center focuses on fundamental, genomics-based research to remove the bottlenecks in the biofuels pipeline. The goal is to develop vertically integrated research programs aimed at developing economically and environmentally sustainable bioenery practices, and educating society, scientists and biomass producers or consumers about bioenergy

issues. The center focuses on corn stover, switchgrass and poplar. State support was an important element of the competition for hosting this multiple university cooperative center.

New York

New York has a large number of private forest landowners and is a member of the Regional Greenhouse Gas Initiative (RGGI) as a backdrop for expanding bioenergy from forests. The New York State Comprehensive Guidebook is a report that provides required procedures to use biomass as part of the fuel supply to meet the state Renewable Portfolio Standard (RPS). The guidebook includes a framework for developing forest management and harvest plans, requirement for an approved forest management plan, definitions of "harvested wood" and "silvicultural wood waste" for qualified biomass.

The state's RPS requires 25 percent of the state's electricity to be supplied from renewable energy by 2013. The state Renewable Energy Task Force has a recommendation to develop and Biofuels Roadmap and sustainable biomass feedstock study in order to help meet the state's renewable energy goals. The New York State Energy Research and Development Authority's programs provide information, research, planning and incentives to businesses and institutions and households. The programs in this authority are exploring alternative financing options to promote a renewable energy industry. The state is supporting evaluation of commercial biomass-fired boilers and stoves used in heating in order to compare energy and emissions, and compare conventional systems to high-efficiency European style biomass boilers.

The State University of New York has an extensive research program on cultivation of willow as a short rotation wood energy crop and conversion of willow to bioenergy and bioproducts. Cornell University is a partner in the BioSciences Science Center at hosted by Oakridge National Laboratory established with assistance from the Department of Energy. The center is focusing on overcoming the recalcitrance of biomass, including engineering plant cells that allow deconstruction to sugars for more economical conversion to biofuels. The focus of the center is switchgrass and poplar.

The Climate Action Plan primarily focuses on tree planting to create carbon sinks. This is consistent with the carbon credits recognized in the Regional Greenhouse Gas Initiative.

Table 1. State Biomass Supply Assessments, Biomass Strategies, Working Groups, and Climate Action Plans (11/11/08)

State	Biomass Supply Assessment	Biomass Strategy	Biomass Working Group	Renewable Portfolio Standard (RPS) or Climate Action Plan (CAP)
Alabama				CAP
Alaska	CROP		Bioenergy	CAP in Progress
Arizona	Yes, CROP			RPS, CAP
Arkansas				CAP in progress
California	Yes, CROP	Yes, bioenergy plan	Yes	RPS, CAP
Colorado	Yes Front Range, Bark Beetle, CROP			RPS, CAP
Connecticut		Yes, clean energy		CAP
Delaware				CAP
District of Columbia				RPS
Florida				RPS, CAP in progress RFM
Georgia		Yes, in Energy Strategy		No
Hawaii				RPS, CAP, RFS
Idaho	CROP in progress		Yes	CAP in Progress
Illinois				RPS, CAP
Indiana				No
Iowa				RPS, CAP in progress
Kansas				CAP in progress, RFS
Kentucky				CAP
Louisiana		(T) (L)		RFS
Maine				RPS, CAP
Maryland				RPS, CAP
Massachusetts	Yes			RPS, CAP rev in progress, RFM
Michigan	Yes, clean energy			CAP in progress
Minnesota	Yes	Yes, Biomass harvest guidelines		RPS, CAP, RFM
Mississippi				No
Missouri				RPS: Goal, CAP, RFM
Montana	CROP in progess		Yes- inactive	RPS, CAP, RFM
N. Carolina				CAP
N. Dakota	Yes- assoc. with fire risk			CAP in progress and RPS:Goal

State	Biomass Supply Assessment	Biomass Strategy	Biomass Working Group	Renewable Portfolio Standard (RPS) or Climate Action Plan (CAP)
Nebraska				No
Nevada			Yes	RPS, CAP
New Hampshire				RPS, CAP in progress
New Jersey	Yes			RPS, CAP in progress
New Mexico	CROP		Yes	RPS, CAP, RFM
New York				RPS, CAP in progress
Ohio				RPS
Oklahoma				No
Oregon	Yes State and Counties, CROP		Yes	RPS, CAP, RFM
Pennsylvania		Biomass harvest guidelines		RPS, CAP, RFM
Puerto Rico				No
Rhode Island				RPS, CAP
South Carolina	Yes			CAP
South Dakota				RPS:objective
Tennessee				CAP
Texas		(T)		RPS
Utah	CROP			RPS:Goal, CAP
Vermont	X			RPS: Goal, CAP
Virginia				RPS: Goal, CAP: Energy Plan
Washington	Yes, CROP in progress	Yes, future forests	Yes	RPS, CAP, RFM
West Virginia	X Logging Residues			No
Wisconsin	X w/biodiversity			RPS, CAP
Wyoming	Yes			No

CAP- Climate Action Plan- State Strategy for achieving global climate change emissions reduction and energy efficiency goals, sometimes addressed in state energy plans.
RFS or RFM- Renewable Fuels Standard or Mandate- State requirement for renewable transportation fuels (ethanol or biodiesel)

RPS- Renewable Portfolio Standards- Require utilities to use renewable energy or renewable energy credits (RECs) to account for a certain percentage of their retail electricity sales – or a certain amount of generating capacity – within a specified timeframe. (Renewable portfolio goals are similar to RPS policies, but renewable portfolio goals are not legally binding.) The term "set-aside" or "carve-out" refers to a provision within an RPS that requires utilities to use a specific renewable resource (usually solar energy) to account for a certain percentage of their retail electricity sales (or a certain amount of generating capacity) within a specified timeframe. More than half of all U.S. states have established an RPS. (Source DSIRE Database Glossary of Terms)

CROP- Coordinated Resource Offering Protocol Study describing the offering of woody biomass and smaller diameter logs across all ownerships in a 50 mile radius for the next 5 years. http://www.forestsandrangelands.gov/Woody_Biomass/supply/CROP/

(L) Louisiana Advanced Biofuels Industry Development Iniative
(T) Biorefinery Siting Model Assessment

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