Rural Voices for Conservation Coalition
Working together to find solutions to the ecological and economic challenges of the rural West.

April 2008

Woody Biomass Issue Paper

The development of national programs and policies to encourage woody biomass harvesting and utilization is moving forward rapidly, and is being driven by a number of factors. Energy security, development of renewable energy, combating global climate change, and wildfire risk reduction are national priorities, and the utilization of woody biomass plays a role in each, as well as in the management of long-term forest health. While the policies and programs currently in existence and in development all hold potential to expand a domestic woody biomass sector, they are inadequately addressing issues of scale, environmental impacts, social acceptance, public lands management, and rural economic development.

Increasingly, markets are emerging for woody biomass that is produced as a by-product of forest restoration and fuel reduction management activities on public lands. Utilization strategies resulting from collaborative efforts to restore forest health can help create markets for woody biomass; integrated, community-scaled utilization strategies can offset the costs of forest restoration and hazardous fuel reduction activities while contributing to rural economies, energy independence, and carbon emission reductions. Businesses, non-profit organizations, and community groups across the United States are developing a range of uses for woody biomass including: value-added products, thermal energy production, combined electric and thermal energy generation, bio-fuels, and composites.

The Rural Voices for Conservation Coalition (RVCC) proposes the following vision, strategies, and recommendations to accomplish broad national goals while restoring ecological integrity to public lands and enhancing rural economies across the West. The RVCC believes in a vision and strategy that promotes policies and procedures that will integrate solutions that correspond to the scale of ecological need, scope of potential environmental impacts, public acceptance, and the need to create economic benefits for rural communities and the American taxpayer.

Key Recommendations

1. Improve and extend Production Tax Credits and qualify thermal biomass energy when developing Renewable Portfolio Standards.
2. Create and fund a grant program to provide capacity building and technical assistance to communities and micro-businesses, and fund existing biomass grant programs.
3. Revise USFS and BLM performance measures and targets to encourage biomass harvesting from the treatment of priority acres identified through a collaborative process.
4. Grant budget and target flexibility and waive cancellation ceilings to facilitate the development of long-term stewardship contracts.

RVCC Vision for Woody Biomass Utilization

- Biomass harvesting and utilization are used as tools to accomplish collaboratively developed public land management objectives based in forest ecology.
- A diversified woody biomass utilization infrastructure exists in rural communities and is made up of appropriately-scaled integrated facilities that sort woody materials for their highest and best use-values to make a suite of wood and energy products.
- The appropriate scale of these facilities and the associated forest management projects to supply them with raw material resources are determined through collaborative processes.
- At the local scale, these facilities provide a means of economic diversification and development for rural public lands communities while supporting ecological restoration, forest fuel reduction, and community wildfire protection.

Who We Are

The Rural Voices for Conservation Coalition is comprised of western rural and local, regional, and national organizations that have joined together to promote balanced conservation-based approaches to the ecological and economic problems facing the West. We are committed to finding and promoting solutions through collaborative, place-based work that recognizes the inextricable link between the long-term health of the land and well being of rural communities. We come from California, Oregon, Washington, Idaho, New Mexico, Montana, Arizona and Colorado.

- At the national scale, these facilities contribute to energy independence and could reduce the net release of carbon into the atmosphere through the reduction of intense, prolonged wildfires and through sequestering carbon in durable wood products.

Accomplishing this vision requires comprehensive and progressive federal policies, programs, and investments. Federal and state decision makers should coordinate the range of actions needed on energy policy, tax incentives, competitive grants programs, technical assistance, and regulatory activities to ensure integration and maximum leverage of efforts whenever appropriate.

Problems with Existing Strategies and Policies

Most of the existing renewable energy policies and programs encouraging woody biomass utilization are focused on developing larger scale (20 + MW) electric generation or bio-fuel facilities in a few key locations and hauling in fuel from far away.

This existing strategy is too narrow in focus and is insufficient for the following reasons:

1. Existing incentives to develop renewable energy are weighted heavily towards electricity and bio-fuels, and often exclude thermal applications from qualification towards renewable energy targets. Generating thermal energy is the most efficient conversion possible from woody biomass, exceeding the efficiencies of both electric generation and liquid bio-based fuels.

2. Incentives targeted exclusively on woody biomass electricity production and/or liquid bio-fuels may create disincentives for other traditional and innovative high-value uses of small diameter wood.

3. The language in the Energy Independence and Security Act of 2007 (Public Law 110–140; 121 Stat. 1492) that defines biomass for applicability to the Renewable Fuels Standard does not include woody biomass from federal lands. This disallows rural communities surrounded by federal lands the opportunity to develop appropriately-scaled renewable energy facilities to help address national energy goals.

4. Building high-capacity electricity transmission lines from rural communities to centers of energy demand is costly and time consuming, which makes both government and utilities reluctant to invest in woody biomass as a feedstock for

Benefits of a Community-scale and Integration Strategy

A strategy that is environmentally appropriate, socially responsible, and economically equitable will provide many benefits including:

1. Community-scaled and integrated facilities lend themselves to efficient local thermal energy generation and national energy independence and security.

2. Utilization of locally derived energy is cost efficient and keeps energy dollars local where they contribute to rural economies.

3. The number of products and jobs created at integrated facilities will far exceed those created by stand-alone facilities. This results in greater economic activity and contributes to increased domestic manufacturing of both durable wood and energy products.

4. Dispersed systems of community-scaled facilities require little or no investment in additional transmission capacity, expediting the development of biomass utilization infrastructure and the implementation of associated forest treatments.

5. Federal investments in rural development are multiplied through local spending and can help improve community economic conditions.

6. Federal investments to stimulate community-scale and integrated biomass harvesting and utilization result in net tax revenue to the federal government through increased private investments and business activity.

7. Controlled woody biomass combustion is considerably cleaner than non-renewable fossil fuel alternatives and can have net neutral carbon dioxide emissions.

8. Collaboratively supported approaches to forest management coupled with community-scaled energy and economic development build social support and reduce conflict among stakeholders with diverse backgrounds.

renewable power.

5. The additional consumption of fossil fuels for long-distance hauling does nothing to promote local or national energy independence. Also, hauling costs increase with distance, quickly exceeding the value of the biomass as a feedstock to generate electricity.

6. Catering exclusively to large scale facilities means that economic development opportunities for rural communities could be missed due to a lack of locally available supply. Additionally, the financial capital needed for large scale electric generation and liquid bio-fuels plants makes the possibility of local community ownership of such facilities nearly impossible for most rural towns.

Five Part Strategy to Support Community-scaled, Integrated Woody Biomass Industries

There are five components of a strategy to support the development of a community-scaled and integrated biomass utilization infrastructure:

1. ***Improve and Extend Production Tax Credits (PTC):*** *Congress should extend PTCs for renewable energy sources to at least 10 years and add language that qualifies thermal energy facilities for PTCs. Also, Congress should place open loop biomass on par with other renewable energy sources at $.019 per kW.*

   Renewable Energy Production Tax Credits (PTCs) currently exist for what is known as "open loop" biomass (open loop meaning unregulated or not farmed). The current credit is valued at $.008 per kilowatt hour (kWh) and is reauthorized on a 2-year basis. Unless reauthorized, PTCs will expire at the end of December 2008. Biomass developers are seeking to bring this credit up to $.019 per kWh (on-par with wind and solar PTCs), and to extend its authorization to a duration more appropriate to large-scale capital investments – 10 years. One critical shortcoming of the existing PTCs is that they do not qualify thermal energy facilities for these credits.

2. ***Qualify thermal energy when developing Renewable Portfolio Standards (RPS):*** *Congress should require that thermal energy generation qualify as equivalent to electric energy and liquid fuels in a national RPS. The Arizona state RPS should be used as an example.*

   Thermal applications are the most efficient conversion technology for turning woody biomass into energy and should be considered in the development of a national Renewable Portfolio Standard (RPS). Thermal applications for woody biomass can be up to 90% efficient, compared to 20% for electricity and 50-70% for bio-fuels. Thermal systems can be applied at multiple scales, and are often more economically viable, particularly in rural and remote areas, than electrical generation.

   By not including thermal energy, one of the most efficient uses of woody biomass energy is put at a disadvantage to generating electricity and processing liquid bio-fuels. This runs counter to the goals of displacing fossil fuels, promoting energy efficiency, and minimizing carbon emissions.

   Excluding thermal applications in a national RPS will continue to focus both federal and private investments on large-scale electric generation and/or liquid bio-fuels development, bypassing opportunities for efficient community-scaled projects.

3. ***Build capacity and provide technical assistance:*** *Congress must establish and fund a new competitive grants program which provides capacity building and technical assistance services to communities and businesses comparable to those offered through the U.S. Forest Service Economic Action Program (EAP). Federal land management agencies should also designate additional biomass coordinators at the Forest and/or Region level who are funded to work with communities and businesses to provide these critical services.*

   Congress must appropriate no less than $5 million per program per year to fund existing biomass grant programs. These dollars will be used to effectively leverage private funds to increase domestic biomass harvesting and the utilization infrastructure necessary to address the scale and scope of challenges identified.

   Many communities and businesses are strategically situated in terms of forest resources, and potential business locations, but are lacking in social and institutional capacity to implement woody biomass utilization projects. Existing fledgling rural manufacturing infrastructure must also be maintained and enhanced to overcome cost barriers associated with lost industry capacity.

   Previously, programs like the Economic Action Program (EAP) administered through USFS State and Private Forestry (S&P) provided the assistance needed to help rural

communities and entrepreneurs develop and maintain their capacity and access necessary technical resources. The absence of a program like EAP leaves the federal agencies with no other direct funding source, such as a budget line item (BLI) to provide technical assistance or capacity building support.

Continued support for biomass grant programs is necessary to provide opportunities for infrastructure development, capacity building, and technical assistance to communities and businesses. Two programs currently exist to support woody biomass infrastructure development. The USFS Woody Biomass Utilization Grants (authorized under Sec. 203, Healthy Forest Restoration Act of 2003) have funded the purchase of critical equipment to improve both the harvesting and utilization of woody biomass. The Improved Biomass Grants Program (authorized under Sec. 210, Energy Policy Act of 2005) has yet to be funded, but could also provide for the development of utilization infrastructure, while giving some technical assistance to recipients to build local capacity.

4. ***Revise performance measures and output targets:*** *Federal land management agencies, in cooperation with the Office of Management and Budget (OMB), must revise their performance measures. The focus must shift from exclusively measuring outputs, to measuring both outputs and outcomes. Correlating outputs with other factors can aid in measuring meaningful outcomes. For example, the agencies could correlate the treatment of priority acres (identified through collaborative processes, Community Wildfire Protection Plans (CWPP), Forest Plans, etc.) with volumes removed of both saw logs and biomass, and the resulting change in condition class per entry. This would create an incentive for both biomass utilization and the treatment of priority acres.*

   USFS and BLM performance measures that are based upon the number of acres treated drive managers to use hazardous fuel dollars for treatments that yield the most acres per unit cost. This forces managers to focus on treating the "easy acres" to meet their targets. This approach does not account for the benefits provided by treatments that thin the highest priority acres in and adjacent to the wildland urban interface (WUI) or in areas identified as high priorities for ecological restoration. Under current performance measure targets, costs and benefits are not fully accounted for by the agencies in making management decisions.

5. ***Ensure consistent wood supply from federal lands:*** *OMB and Congress must provide the agencies with budget and target flexibility to plan and implement long-term stewardship projects targeted at biomass harvesting and utilization. Congress must allow the federal land management agencies to waive cancellation ceilings on long-term integrated resource service contracts under the Federal Acquisition Regulation (FAR).*

   Obtaining a consistent supply of woody biomass from federal lands is one of the primary impediments to developing a biomass utilization sector that would reduce costs of forest treatments and wildfire suppression. The USFS and BLM currently lack the workforce capacity and budget flexibility to plan and administer long-term stewardship contracts. In the instance of the White Mountain 10-year Stewardship Contract in Arizona, a large proportion of the National Forests' funding and staff resources are required for successful implementation, leaving other districts in the region without the capacity to develop similar contracts. Congress needs to realize that achieving positive results like those of White Mountain are an investment rather than a cost.

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Community Forestry Resources
Conservation Northwest
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Northeast Washington Forestry Coalition
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ShoreBank Enterprise Cascadia

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American Forests
Pinchot Institute for Conservation

Woody Biomass Definitions of Terms

A community-scaled integrated utilization strategy provides an ecologically appropriate, economically viable, and socially responsible approach to using woody biomass. A dispersed network of community-scaled facilities of either small-scale energy facilities or interrelated wood products businesses plays a localized role in restoring forest conditions and fostering community economies. Collectively, these interrelated facilities provide the most practical and efficient approach to address ecological restoration at the landscape level while sustaining the sense of place and heritage of rural communities.

What is Woody Biomass?

Woody biomass, as defined in a 2003 Memorandum of Understanding between the Secretaries of the U.S. Departments of Agriculture, Energy, and Interior includes:

> "The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment that are the by-products of restoration and hazardous fuel reduction treatments."[1]

Woody biomass is generally composed of smaller-diameter trees and stems that are often no more than 8" to 12" in diameter. This size of material is generally considered non-merchantable relative to the locally available conventional markets for wood products like sawtimber for dimensional lumber.

The removal of woody biomass, by definition, is not the primary objective of federal forest management activities. Woody biomass is often a by-product of hazardous fuels reduction or ecological restoration actives that are undertaken to restore the ecological integrity of forested ecosystems. Examples of ecologically-based forest management objectives include the reduction of forest fuels, accelerating the development of old forest characteristics and structure and enhancing wildlife habitat.

What does Woody Biomass Utilization Mean?

Woody biomass utilization is defined in the 2003 Memorandum of Understanding between the Secretaries of the U.S. Departments of Agriculture, Energy, and Interior as:

> "The harvest, sale, offer, trade, or utilization of woody biomass to produce the full range of bio-based products and bio-energy, including timber, engineered lumber, paper and pulp, furniture and value-added commodities, and bio-energy and/or bio-based products such as plastics, ethanol, and diesel."[1]

The variability in species-related properties and size characteristics of woody biomass, allows for a wide range of options for using it to create other products. The woody biomass sector can be loosely defined as a compilation of wood products businesses (including those generating energy) that use woody biomass of all sizes and quality characteristics. Some examples of uses for woody biomass include the creation of wood products and energy.

Wood Products

Value-added wood products: Products like wood flooring and moulding, roundwood products like fencing and posts and poles, and finished goods like windows and cabinetry can all be created from woody biomass. Generally, value-added products are manufactured from trees or stems that are larger than 4" in diameter. The creation of these products is considered to add value because in the past, woody biomass has not been used to make conventional wood products and was traditionally deemed to have little or no commercial value.

Composites: Smaller pieces of wood fiber can be reformulated, often using resin or glue to hold them together, into solid wood substitutes like oriented-strand board (OSB), particleboard, or composite decking. In general, most of these manufacturing processes require considerable amounts of investment capital and large quantities of raw material making them impractical for smaller, rural-based enterprises to pursue.

[1] Norton, G., S. Abraham and A. Veneman. Memorandum of Understanding on Policy Principles for Woody Biomass Utilization for Restoration and Fuel Treatments on Forests, Woodlands, and Rangelands. June 18, 2003.

Renewable Energy

Energy production: Woody biomass can be used to generate several forms of energy, including electricity, thermal energy (heat), combined heat and power (CHP), or liquid bio-fuels (cellulosic ethanol, bio-oil, biodiesel).

Electricity can be produced by burning woody biomass to heat water and create steam. The steam then drives a turbine to produce electricity. The term **hog fuel** is often used in the context of producing electricity from woody biomass. Hog fuel is a proven forest products industry use of tree bark and limbs to generate on-site electricity or thermal energy to reduce energy costs.

Thermal energy, or heat, can also be produced from woody biomass. Burning hog fuel, forest slash, or wood chips in a wood-fired boiler for use in either **space heat** (the use of thermal energy to heat an enclosed space or building) or **process heat** (the use of thermal energy to provide heat for a step in an industrial process, such as drying lumber). Woody biomass can also be manufactured into **densified wood products** like wood pellets, bricks and logs, that are then burned in industrial boilers or specifically-designed residential stoves. Wood pellets are generally made from trees smaller than 4" in diameter, limbs and the residual sawdust and peelings generated from other wood processing activities.

Liquid bio-fuels including cellulosic ethanol, bio-oil, or biodiesel can be produced from woody biomass. Emerging wood-to-ethanol technology converts woody biomass through a biochemical or thermochemical process into sugars, which are then fermented to produce ethanol. Cellulosic ethanol can be used as a replacement of or in combination with, traditional gasoline.

The current energy markets for electricity and the lack of technology that currently exists for creating liquid bio-fuels from wood make the generation of thermal energy the most economically and energy efficient conversion of woody biomass. From a carbon perspective, wood fuel can be used to displace the use of heating oil, natural gas, or propane in heating public facilities in rural communities.

Often, **community-scaled thermal energy applications** that produce heat for community schools and public buildings only require woody biomass from 100-200 acres of forest restoration treatments per year.[2] This small amount of material eliminates the threat of competition for locally-derived woody biomass among communities. **Locally-derived fuel** can be defined as woody biomass sourced from forest restoration treatments within 50 miles of the facility or produced as the byproduct of manufacturing processes at a local integrated wood products facility.

What are Integrated Wood Products Facilities?

Traditionally, wood products have been manufactured at larger, stand-alone facilities in which only one product or class of products is made; for example, a stand-alone facility might produce dimensional lumber but not flooring, posts and poles, or composites.

Smaller trees are more expensive to remove from the forest and do not yield the same volume of products as larger diameter trees. For these reasons, integrated wood products facilities offer the most cost-effective means to utilize woody biomass.

An **integrated wood products facility** typically sorts woody biomass for its highest-value use and then manufactures a suite of different products. For example, an integrated facility might manufacture flooring from the largest portion of the tree, posts and poles from the "top" of the tree, and use any remaining portion of the tree along with sawdust residuals to produce thermal energy. This integrated approach, often referred to as **full utilization,** can result in a higher yield per tree than typical stand-alone facilities thus distributing the additional costs over more products.

What is an Appropriate Scale for These Facilities?

Integrated wood products facilities and/or stand-alone energy generation facilities are most applicable when they are **appropriately-scaled** as defined through a collaborative approach evidenced by broad stakeholder involvement, analysis, and agreement on a range of issues including sustainable supply, ecological impact, and community benefit. If facilities are scaled appropriately, these businesses can avoid the historical "boom and bust" of the conventional wood products industry, and instead serve as tools to improve the economics of ecologically and socially driven forest management.

[2] Calculated based on the energy needs of several community-scaled projects in central Oregon. On average, these facilities would utilize the energy equivalent of 1000 tons of woody biomass annually. Typical restoration treatments remove between 5 – 10 tons per acre. Therefore, 1000 tons / 5 tons per acre = 200 acres.

For most rural places, a **community-scaled** approach is the most appropriate. This scale is also defined through a collaborative process and can be thought of as a sub-scale of appropriately-scaled facilities. Community-scaled facilities are designed to adapt to changes in volume and type of material being supplied, to accommodate limitations in transportation distances and inefficiencies, and for integrated wood products facilities, to efficiently produce a variety of products to reflect these variations over time. These characteristics enable community-scaled facilities to adjust to ecological and economic changes over time, building resiliency into the local economy. Community-scaled approaches can also consider unique ownership, investment, and management structures.

Financially, both value-added wood products businesses and energy facilities need a consistent supply of raw materials to attract investors and/or financing options. Consistent supply does not necessarily equate to a large quantity of supply. If a business is community-scaled, relatively low amounts of volume can be supplied over a longer period of time, giving rural businesses longevity.

Benefits of Community-scaled Woody Biomass Utilization

A community-scaled integrated utilization strategy can lead to the most practical, efficient and applicable approach to restoring forested ecosystems, fostering local economies, and sustaining rural communities.

Place-based solutions can **build capacity** simultaneously in multiple communities by increasing:

- Human capital through education and skills training, social and cultural capital through fostering a collaborative spirit among residents,
- Physical capital through providing support to improve community infrastructure,
- Financial capital by pursuing grants and/or loans to leverage private investment for business development, educational needs and skills training.

Some of the benefits of a community-scaled, integrated woody biomass utilization approach include:

Economic benefit and equity:

- Improved economics of and accelerated implementation of critical forest restoration and community wildfire protection activities.
- Reduced economies of scale and raw material needs allowing for adaptive forest management.
- Maximizing the value of woody biomass by sorting for its highest-value use and co-locating users of by-product residuals.
- Distribution of economic benefits to rural forest-based communities and the nation through local ownership, increased entrepreneurial activity, and/or community benefit criteria in federal grant and contracting work.
- Local retention of tax base and profits.

Social support for woody biomass utilization through collaboratively identified common ground among local leaders and interest groups from different sectors and backgrounds.

Environmental benefits to communities and the nation through:

- Reduced fossil fuel consumption and carbon emissions from heating public facilities,
- Contributions to accelerated forest restoration through removal of biomass materials,
- Reduced carbon emissions and smoke pollution from wildfire.

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