

Investing in Biomass Thermal Energy

Heating Needs in Rural Communities

Approximately one third of the energy consumed in the United States is used to produce thermal (heat) energy, and one third of thermal energy is generated from petroleum products. Thermal energy is used for space, industrial processes, and water heating. It can be generated from many sources, including electricity, natural gas, petroleum-based fuels (heating oil, propane, kerosene), geothermal, solar, and increasingly biomass.

Rural communities overwhelmingly rely on fossil fuels for heating homes and businesses. Expensive and inefficient heating sources such as electricity and petroleum account for as much as 40% of Oregon's thermal energy consumption, and an average of 81% in northern New England. New England and New York alone account for 84% of the nation's consumption of heating oil.

Rising costs and volatility of petroleum-based heating has negative economic impacts in communities across the nation. Significant household and business wealth/income is lost to energy exports each year; eighty cents of every dollar spent on fossil fuels leaves the local economy, and much of it leaves the nation. In an effort to restore forest health, retain wealth, and create local jobs, rural areas are increasingly harnessing locally produced woody biomass as an alternative fuel for thermal energy production used in schools, hospitals, and commercial businesses.

A "Self-Sufficient" Thermal Biomass Solution

Utilizing woody biomass to produce thermal energy is a clean, commercially viable, and cost-efficient means to reduce dependence on foreign oil. The technology is sound and the distributed nature of energy production increases grid capacity while reducing environmental impacts. Woody biomass removal and utilization activities also provide ecosystem benefits by reducing forest fire risk, improving forest stand health and productivity, and restoring natural habitat. Finally, using local forest resources to produce heat at a significant energy savings is also a critical means to increase rural economic development.

Action Needed

We urge the Administration and Congress to establish clear thermal energy policies, including:

- Goals for renewable energy production
- Prioritizing use of domestic fuels
- Renewable Portfolio Standards that include thermal energy and renewable energy credits for thermal applications, including biomass
- Grant programs and/or revolving loan funds to retrofit existing boilers at institutional facilities
- Tax incentives designed around an efficiency threshold for new and existing facilities to capture more total energy from renewable resources
- Expanded eligibility under Residential and Business Renewable Energy Investment Tax Credits for high efficiency biomass systems
- Renewed authorization for key programs in the Farm Bill, such as the Community Wood Energy Program
- Continued investment in the Woody Biomass Utilization Grants Program under the Hazardous Fuels line item, authorized through the Healthy Forest Restoration Act (HFRA)

Rural business and institutional facilities such as schools and hospitals not serviced by natural gas are capitalizing on wood based energy for heating needs, and are saving hundreds of thousands of dollars annually on energy bills – dollars that are reinvested in local economies for other pressing needs.

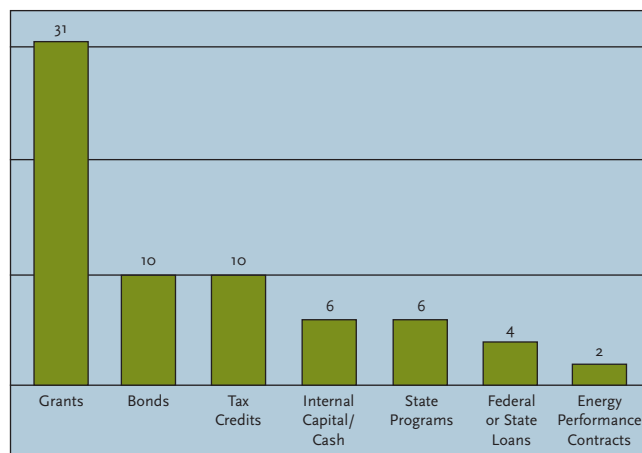
Despite the potential for significant savings and favorable financial return, many communities and businesses interested in retrofitting existing boilers or constructing new district heating systems face **barriers in acquiring capital at a satisfactory interest rate for design and construction**. To narrow the gap, projects often require state and federal grants to provide some initial capital, and

Select funding sources for projects in this assessment

(Note that this is a subset of available funding sources):

- ARRA State Energy Program (expired)
- USDA Forest Service Fuels for Schools
- Qualified Zone Academy and Construction Bonds
- Oregon Business Energy Tax Credit (expired)
- Oregon Community Renewable Energy Feasibility
- Oregon SELP Loan
- Oregon SB1149 Funding – public school energy efficiency fund
- Oregon Cool Schools program—low interest financing program
- Maine Dept. of Conservation and Dept. of Education grants
- Maine Forest Service
- Student Campus Greening Fund
- State of Vermont Construction Aid
- Regional Greenhouse Gas Inventory grants

Number of projects using funding source types



a combination of tax credits and low interest loans and bonds to reduce long term risk. Given high up-front costs, many of these installations would not be built without these sources of financing. Expanding eligibility and the availability of capital is critical to moving the current backlog of projects through the feasibility process to successful implementation.

The Costs and Benefits of Biomass Energy

The following is an aggregate of averaged costs and resulting benefits from 47 institutional biomass thermal energy systems in Oregon, Maine, New Hampshire, and Vermont. These results are applicable to other regions of the country for similar sized installations. Facilities analyzed were broken out into three size classes: less than 3 Million BTU/hour (21 projects), 3-10 Million BTU/hour (21 projects), and 10-40 Million BTU/hour (5 projects).

Collectively these 47 projects represent:

- 13.25 million square feet of heated building space
- \$82,123,000 in capital investments
- 168,077 green tons of biomass used annually
- 5,900,000 gallons of heating oil equivalent reduction
- \$8,676,000 - \$17,500,000 annual fuel cost savings, reinvested in local communities
- 300 full time, permanent jobs created in the wood products and transportation sectors
- 11 – 21 years financial payback period

Aggregate data derived from the Wood2Energy Database available at <http://www.wood2energy.org/>

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Capturing Future Benefits

Access to working capital (project planning and construction) is the largest barrier to growth of the biomass energy sector. One-time initial investments will leverage long-term outcomes and provide for durable businesses and local employment. A combination of federal and state loan, grant, and tax incentive programs will maximize benefit for communities and opportunities for public-private partnerships.

This aggregated cost and benefit assessment demonstrates that biomass thermal energy benefits and community reinvestment justify the investment of state and federal funds. For example, fully funding the **Community Wood Energy Program** at \$5 million annually would yield:

- \$10 million cost:
 - Federal funding: \$5 million (with \$4.8m for project funding, balance for planning)
 - Nonfederal match: \$5 million
- \$2,918,521 in annual savings (median \$264,841/institution)
- 16 full time, permanent jobs created in the wood products and transportation sectors
- 780,000 square feet of building space heated (equivalent to two hospitals and five schools)
- 9,135 tons of biomass used (pellets and chips)
- 786,647 gallons of heating oil displaced annually
- 5 years average payback period

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