Wood bioenergy development as a component in community strategies for sustainable economic development

Michael DeBonis[1]

Summary. Wood bioenergy plays a significant role in national and local efforts to develop renewable energy sources to improve energy security, combat global climate change, and reduce the risk of wildfires. Wood bioenergy also holds tremendous promise as an economic development tool for rural, forest-based communities. Appropriately-scaled biomass facilities developed through a collaborative process can support community social and economic goals while improving forest health. The development of policies and incentives has been instrumental in providing the regulatory and financial support needed to move bioenergy projects forward. Yet, most of the existing incentives to develop renewable energy are weighted heavily towards large-scale electricity and bio-fuels facilities, and often exclude thermal and community-scaled biomass applications.

Keywords. [Forthcoming]

Forests and the economic sustainability of rural communities

Forests and the forest industry have a significant impact on the economies of rural, forest-based communities. For many rural communities, economic stability is reliant on the existence and success of local forest-based industries. As tragically played-out in communities across the nation, the decline or departure of an industrial economic driver can have a devastating effect on regional and local economies. In Trinity County, CA, timber and recreation industries are the core sectors of the economy. Over the last 20 years Trinity County's economy has been affected by changes in national forest management. The "forest closure" of 1990 affected over 30 logging families in Hayfork and the subsequent sawmill closure in 1996 affected over 150 families. In a few short years, over 40 percent of the payroll in Hayfork, a town of 2000 people, had disappeared. At the same time, the Forest Service downsized its workforce and thirty government jobs were lost (Carlton, 2008). In Berlin, NH, when the mill that had operated for over 100 years shut down, hundreds of jobs were lost, tax revenue declined and an economy built on the paper industry evaporated (Lacey 2007). Communities affected by the loss of a dominant industry, whether it is a paper mill or a shoe factory are left asking the question: what next?

New opportunities

Places like Hayfork, CA and Berlin, NH are looking to new economic development opportunities, including wood bioenergy. In Hayfork, the mill has re-opened to process small diameter trees and scrap wood – with a focus on improving forest health and meeting community social and economic goals. The mill uses an integrated approach utilizing a variety of wood products for their highest and best use, including saw logs, wood pellets, and a boiler that burns wood waste to heat a dry kiln (WRTC 2008). In Berlin, NH, a proposal is underway to convert the old paper mill to a 50 megawatt electrical power plant powered by biomass. The plan, if successful, will create

[1] Southwest Region Director, Forest Guild

approximately 40 full time jobs and support another 500 (Lacey 2007). For Hayfork and Berlin – and many communities like them - small wood utilization and wood bioenergy won't replace the economic importance of the old forest-based industries, but combined with other economic development efforts it can support a positive economic future for the communities.

Appropriately scaled bioenergy development

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). Wood bioenergy development, whether part of a dispersed energy network or stand-alone energy generation facilities, is most applicable when appropriately-scaled as defined through a collaborative approach. Collaboration is evidenced by broad stakeholder involvement, analysis, and agreement on a range of issues including sustainable supply, ecological impact, and community benefit. Appropriate scale varies geographically. Developing appropriate scale bioenergy through a collaborative process yields facilities that contribute to the economic, ecological, and social goals of the geographic region. When planning is done absent collaboration or focused too heavily on any one component, e.g. supply or economic bottom line, facilities may be unsustainable over time and fall victim to historical "boom and bust" of more conventional industries (RVCC 2008).

Fore some communities, larger scale (20 + MW) electric generation, bio-fuel, and/or combined heat and power facilities are appropriate based on available supply, existing infrastructure, market conditions, and other factors. For most rural places, however, a community-scaled approach is the most appropriate. Community-scaled facilities are designed to adapt to changes in volume and type of material being supplied, and to accommodate limitations in transportation distances and inefficiencies. 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. Bioenergy 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 (RVCC 2008).

At a community or business scale, bioenergy can be a component of an integrated woody biomass utilization strategy that sorts woody biomass for its highest and best use to make a suite of wood and energy products – lumber from large diameter saw logs, posts from small diameter logs, and wood chips from slash and small trees. A dispersed network of community-scaled facilities of either small-scale energy facilities or interrelated wood products businesses plays a localized role in meeting forest management goals and fostering community economies (RVCC 2008).

Appropriately-scaled wood bioenergy facilities increase rural community energy conservation and self-reliance, reduce regional oil-related fuel consumption, and realize

significant energy savings. Appropriately-scaled wood bioenergy facilities keep energy dollars local; limiting leakage of economic resources can have a significant positive financial impact on a community's economic sustainability.

Policies and incentives for sustainable bioenergy development

Growth and development of the renewable energy sector is largely dependent on renewable energy and energy efficiency incentives and regulatory policies administered by governments and corporations. Incentives and policies are used to reduce or eliminate certain financial barriers and to create the regulatory framework needed to develop or implement renewable energy initiatives.

Renewable Portfolio Standards (RPS) are policies mandating a government body – typically a state- to generate a percent of its electricity from renewable sources. Each body has a choice of how to fulfill this mandate using a combination of renewable energy sources, including wind, solar, biomass, geothermal, or other renewable sources. Some RPSs will specify the technology mix, while others leave it up to the market. Variability in how an RPS is administered is important as different states will have a different component of renewable energy resources and/or capacity (REPP 2008). For example, New Mexico requires investor-owned utilities to include 10% percent of their renewable energy portfolio to come from biomass or geothermal energy sources (DSIRE 2008). Currently, a federal RPS does not exist. For states that have an RPS, the policy drives the development and implementation of renewables that support the portfolio standard. Conversely, renewable energy sources that do not support the portfolio standard are placed at a significant disadvantage in terms of development resources and investment opportunities.

Renewable production tax credits are incentives that federal, state, or local governments provide to companies that generate energy from renewable sources such as solar or biomass sources. The federal Renewable Electricity Production Credit (PTC) is a per-kilowatt-hour tax credit for electricity generated by qualified energy resources. Originally enacted as part of the Energy Policy Act of 1992, the credit has been renewed several times, including, most recently, in The Emergency Economic Stabilization Act of 2008 The credit applies to multiple resources, including open-loop biomass (REPP 2008) The Database for State Incentives for Renewables and efficiencies contains an up-to-date list of federal and state policies and incentives – visit http://www.dsireusa.org/index.cfm. There are numerous wood bioenergy development opportunities that make sense for a community or region. However, policies and incentives are needed to maximize the ecological, economic and social benefits from wood bioenergy developments. Most of the 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.

Thermal applications of biomass tend to be the most efficient conversion technology for turning woody biomass into energy – more so than electric generation and liquid bio-fuels. Thermal applications for woody biomass can be up to 80% efficient, compared to

20% for electricity and 50-70% for bio-fuels (FPL 2004). Controlled woody biomass combustion is considerably cleaner than non-renewable fossil fuel alternatives and could have net neutral carbon dioxide emissions (Wilson 2006). Thermal systems can be applied at multiple scales, and are often more economically viable, particularly in rural and remote areas, than electrical generation.

Some federal policies also serve as a barrier to the development and application of wood bioenergy development opportunities. 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. The current definition is a barrier to rural communities surrounded by federal lands who are working to develop appropriately-scaled renewable energy facilities and hinders efforts to restore forest health and address national energy goals. The definition was created based uncertainty about sustainable harvesting of feedstock from public lands for the development of liquid transportation bio-fuels. There are concerns about the development of large-scale biofuels facilities and that the feedstock required to keep these facilities going could lead to unsustainable management practices.

Concern over using woody biomass to generate liquid biofuels underscores the need develop appropriately-scaled bioenergy initiatives collaboratively. Addressing community and stakeholder concerns as part of the collaborative process will reduce conflict and lead to a more successful bioenergy facilities.

Conclusion

Wood bioenergy development holds tremendous promise for helping to meet national, state, and local energy needs. Federal and state policies and incentives aid in the development of new bioenergy technologies and are essential for leveling the playing field and making renewables competitive with other energy sources. Wood bioenergy facilities when developed at appropriate scales can support rural economic development efforts while meeting community ecological and social goals. Collaboratively developed bioenergy facilities support local energy independence, keep energy dollars local, and contribute to community social and economic development goals. Policies and incentives need to be developed that support thermal bioenergy applications and community-scaled bioenergy development.

References

Carlton, Jim. "First It Takes Then It Gives." Wall Street Journal. March 24, 2008. R10.

Ferrell, John., D, Morris. 2008. Rural Power: Community-Scaled Renewable Energy and Rural Economic Development. New Rules Project.

Forest Products Laboratory. 2004. Wood Biomass for Energy.

Lacey, Stephen. 2007. "The Economic Impact of Renewable Energy." Renewable Energy Access.com.

Database of State Incentives for Renewables and Efficiency, 2008. http://www.dsireusa.org/

Renewable Energy Policy Project. 2008. Renewable Portfolio Standards. http://www.repp.org/rps/index.html

Watershed Research and Training Center, 2008. http://www.thewatershedcenter.com/

Wilson, James. 2006. "Using Wood Products to Reduce Global Warming." Forests, Carbon, and Climate Change: A synthesis of findings. Oregon Forest Resource Institute. 117-130.

Woody Biomass Issue Paper. 2008. Rural Voices for Conservation Coalition.