

Biomass to Electrical Energy Policy Initiative White Paper

Drafted for Biomass Economic Recovery Group of Northern Sierras
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Summary

The California Biomass energy industry at its peak in the early 1990s converted ten million tons of biomass from agricultural, forestry and urban wood waste into two percent of the state's electricity supply (Morris 2000). Since then deregulation has led to power contracts that have greatly reduced the viability of biomass plants, as their cost of production exceeds the market prices for fossil fuel based energy. As of May 2011, of 43 California biomass plants in operation in 1994, six are now non operational and seven are available to resume operations with the right incentives (UC Woody Biomass Utilization, 2011). Biomass-to-energy plants provide many benefits to society beyond producing green energy. Unlike solar and wind, biomass provides an important source of baseload generation. They are critical in improving forest health, reducing wildfires, reducing air resource impacts, protecting water quality, providing employment opportunities in rural communities and a tax base for local communities. Power purchase agreements for biomass electricity need to incorporate the value of the environmental services provided. In 1999, the environmental services provided by biomass energy production were estimated to be in excess of 10 cents per kWh (Morris, 1999). A review of overall state and private expenses shows that these services are still provided but are essentially financed through different means.

Recognition of these environmental services is essential given that the cost of power production from biomass exceed those based on natural gas. As noted by Morris (2002): "Electricity from biomass plants is more expensive than from fossil fuels, as biomass fuels are bulky and expensive to collect, process, transport, and handle. Also the dispersed nature of the fuel supply constrains biomass generating facilities to smaller size power plants that are not able to achieve the economies of scale of competing plants."

Forest Health

Each year the forests produce renewable biomass. In some areas, the large number of small trees increases the nutrient stress on all trees and increase their susceptibility to insect and disease mortality. The policy of aggressive suppression of wildland fire in California has also led to the accumulation of the excessive amounts of fuel. This threatens forest sustainability, as they are susceptible to higher intensity fires that instead of consuming brush under the trees, can cause significant tree mortality, and in extreme cases, complete deforestation. Such fires also destroy wildlife habitat that these forest provide. Private timber landowners are not able to obtain economical insurance against fire losses on timber stands that take 40 to 60 years to mature to harvest. This risk of loss limits the viability of timber production and sustainability of this land use. The potential revenue generation from biomass utilization can be a vital source of funding for forest health enhancement and ecological restoration projects on both public and private lands.

Wildfire

Past wildfires have cost hundreds of millions of dollars for suppression, decreased water quality, and impacted the stability of rural communities. Fire prevention actions have been funded by the

National Fire plan and other federal and state grant programs. Communities have used these grants to masticate (mechanical chopping of fuels at a cost range of \$700 to 1100/acre) or hand cut and pile fuels for burning (\$1,200 to 2,100/acre). Society would be better served by local biomass plants that could utilize this fuel for energy while decreasing woody biomass accumulations that may lead to catastrophic fire. The National Fire Plan and other grant funds are quickly declining and fuels continue to regrow after treatment. Rural communities need a sustainable method to reduce fuels to protect their homes, businesses, watersheds, and wildlife habitat. Also, many homeowners in Northern California which are in or near forested environments are finding it increasingly difficult to obtain homeowners' insurance due to risk of wildfires.

Air Resources

Biomass provides an alternative to pile burning of forest slash and orchard prunings. The use of this material in a controlled combustion greatly improves air quality. Reductions in particulate emissions, such as those from wildfires, have been demonstrated to reduce health care costs.

Water Quality

High intensity fires provide ash and bare soil that is easily moved in heavy rainfall events into streams. Studies have shown that post fire water flows have increased ammonia and sediment levels. This sediment impacts fisheries and stream function. Northern California serves as the water source for much of the state. Increased sediment inflows are a major management requirement issue for dams and reservoirs to maintain present water holding capacity. The high costs of water supply augmentation projects and fisheries restoration projects are typically covered by federal funds or state bond funds.

Employment Opportunities in Rural Communities

The California Biomass Energy Alliance estimated that in 1996 that the industry provided almost 3,000 rural jobs (Morris, 1999). This includes the field accumulation of fuels, transportation, and energy production. Trained and certified steam turbine engineers in biomass electricity plants provide high quality rural jobs. More local employment in rural areas also increases local sales and property taxes as they spend their wages in the local economies.

Tax Base

Biomass plants provide a tax base for rural communities. As many rural communities are losing timber processing, these plants can provide an important revenue to provide local community services.

For more details on biomass to electricity go to

http://ucanr.org/sites/WoodyBiomass/Woody_Biomass_Utilization_2/Energy/

Options for policy decision makers to consider

1.) *Price*

Price schedules that consider the benefits of forest health, wildfire risk reduction, water and air quality improvement, and rural economic development should be considered. This would provide an immediate response by investors. Since the estimated levelized cost of electricity produced from biomass is within the range of most other renewables and far less than solar (California Energy Commission, 2009), factoring in the economic value of other environmental benefits would be very competitive with all sources of energy.

2.) Utilize tax based incentives for investment in biomass to energy similar to those in Oregon where similar environmental benefits to those here in California were explicitly considered:

Biomass Producer Credit

<http://www.oregon.gov/ENERGY/RENEW/Biomass/TaxCdt.shtml>

This is a transportation tax credit (for OR income tax) that is used to incentivize the production, collection and transportation of biomass for energy projects. The credit is \$10/green ton from eligible sources delivered to eligible facilities (need to be 40% thermally efficient which would rule out electricity unless CHP).

Oregon Legislation

In 2005, the Oregon Forest Biomass Working Group (FBWG) was established to meet the directives in Oregon Senate Bill 1072

(<http://www.leg.state.or.us/05reg/measpdf/sb1000.dir/sb1072.en.pdf>) and to accomplish the biomass goals in the Governor's Renewable Energy Action Plan (REAP)

<http://www.oregon.gov/ENERGY/RENEW/docs/FinalREAP.pdf>

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