

Biomass Power Plants should Run Full-time

There have been questions raised as to how to get more renewable electricity from the US biomass-fueled generation industry. A better question that should be asked first is how to maximize the electricity generation from the existing biomass industry since that will be the cheapest increment of additional biomass energy.

The existing waste-wood-burning biomass power industry consists of about 90 power plants nationwide, distributed across 18 states, and generating over 1,600 MW of power. These plants burn the woody wastes in air pollution-controlled boilers, boil the water to make steam, which drives a turbine that turns a generator, making electricity.

The biomass power industry produces a number of societal and environmental benefits in addition to its displacement of fossil-fueled electricity generation, which is a benefit common to all renewable generation technologies. In brief, the biomass power industry provides an environmentally responsible means of disposal of about 25 million tons of woody wastes annually, turning waste materials into valuable electricity. It prevents the open burning of a substantial amount of these tons, mostly agricultural and forest residues, with the attendant massive amounts of air pollution. It provides an alternative to landfill disposal of a substantial portion of these tons, with its attendant consumption of landfill volume and resulting generation of landfill gasses.

The price of electricity varies according to the demand. During hot summer weekday afternoons, the demand for power is typically highest, and so is the price. At two in the morning on a weekend in the spring or fall, the demand is generally lowest, and so is the price of electricity. These latter times are called “off-peak” hours. Many power plants shut down or curtail generation during off-peak periods, because the price they would receive for their power isn’t high enough to cover their marginal cost of operation. Most of the US biomass plants are operating under power sales contracts that are sufficient to keep the plant in business, but are not sufficient to assure continuous operation, especially during off-peak times.

But if a biomass plant shuts down, it robs the grid of renewable electricity, which is then instead provided by a fossil fuel powered plant, and it results in the unused waste wood fuel being returned to the waste stream for alternate means of disposal. Finally, every biomass power plant actually produces a “negative” greenhouse gas (GHG) emission profile by virtue of eliminating the alternate means of disposal of the waste biomass, all of which produce more GHGs per ton than does a biomass power plant. Therefore, shut down or curtailment of a biomass plant results in an overall greater amount of GHG emissions compared to continued operation of the biomass plant.

So the question above can be restated: How can we prevent today’s existing biomass power plants (or tomorrow’s new biomass plants) from curtailing generation or shutting down during off-peak periods of low power prices?

An effective approach is to provide the same production tax credits to biomass plants as are available to wind and geothermal, generation technologies. [At the present time, the production tax credit available to an existing biomass plant is only 50 percent of that available to some other renewable electricity technologies.] If the benefits of such equal tax credits were to be added to the actual sale prices of biomass power, the result would be generally sufficient to keep a biomass plant running full-time, including through off-peak periods. This result would be environmentally beneficial from a number of standpoints, as are summarized above.