Biomass 101

1. The California biomass power industry consists of 31 plants running at this time, and 11 plants that are idle. The idle plants are in various states of disrepair, ranging from essentially operable with minor work to seriously degraded and in need of major investment to restart. The total operating capacity is about 610 MW, and the idle capacity is about 122 MW. A number of biomass plants have been dismantled. All of the biomass plants that have closed have done so for economic reasons, and the inability to compete on price with fossil-fueled generation. The plants are distributed across 17 California counties.

2. None of the operating plants are in healthy financial condition. Almost all are depending on the CEC PGC subsidy in order to operate in off-peak conditions. A few plants are believed to be dependent on the CEC subsidy to remain in business at all.

3. Biomass power generation is intrinsically much more expensive than natural gas-fueled generation and most other forms of renewable generation (solar is the exception here). This high cost of generation is largely due to the costs associated with the biomass fuel, but also to high capital cost and an efficiency only half that of a combined cycle gas turbine.

4. Biomass fuel costs include:

    - costs of collection, processing, quality control, and transportation of the material to the plant;
    - costs of handling, blending, feeding at the plant;
    - costs of emission controls peculiar to wood fuel combustion;
    - costs of ash disposal.

    Each of these steps is both labor and equipment intensive. Biomass plants require 10 to 20 times the staff per mw of a natural gas-fueled power plant of, including the dedicated fuel infrastructure personnel.

5. Biomass power plants cannot realize the economies of scale available to a multi-hundred MW gas plant, because the fuelshed limits plant size. Fuel cannot be economically obtained from much more than about 100 miles away, and thus the recurring volume of waste wood within this distance inherently limits the amount of fuel and thus the plant size. However, in total, there is sufficient biomass available to fuel significantly greater biomass generation in California.

6. California biomass plants are profit-making private businesses, and have implemented every efficiency-improving mechanism and practice that is economically sensible. As a result, continual increases in costs, such as workers compensation costs, personnel salaries, medical insurance, spare and repair parts, contractor services, et al, cannot be absorbed by improvements in efficiency. The plant revenue must pace the increases in operating cost.

7. With the exception of emission offsets that are sometimes credited when otherwise-open-burned agricultural wastes are instead used as fuel in a biomass plant, none of the environmental benefits provided by biomass power plants are remunerated. The waste management benefit of environmentally-responsible disposal of about 6 million tons per year of solid waste in California is uncompensated, including the landfill burden relief of about 2 to 3 million tons per year of solid waste and the wildfire risk reduction and watershed management improvement of 2 to 3 million tons per year of forest waste.

   A detailed study by the National Renewable Energy Laboratory of the U. S. Department of Energy (1999) concluded that the non-electric environmental attributes of biomass power generation are worth at least 11 cents per kWh. The methodology of this study was to calculate the costs of the alternate fates of the biomass materials absent their use as power plant fuel.

   The near-exclusive rural provision of jobs is unrecognized, and instead the high labor requirements of biomass power are criticized as increasing the cost of biomass power.

8. Biomass power is reliable baseload electric power. Biomass plants cannot easily perform load-following, and cannot be routinely dispatched due to the inherent limitations of a combustion/steam-cycle power plant. Rather than claims that California has enough power from gas, hydro, and nuclear generation and thus doesn't need baseload biomass power, the state should say that is doesn't have enough biomass generation, but has too much fossil, hydro, and nuclear and is willing to curtail these sources and support additional biomass power.

   In spite of substantial effort by the California biomass power industry, the state has no biomass policy of any sort. Consequently, no California agency has any guidance or policy on which to base or justify decisions regarding biomass power.

9. Numerous studies have addressed new, "better" technologies for use of biomass to generate power or manufacture other fuels or chemicals. None of these, however, will reduce or eliminate the fuel-related costs and limitations described in items 3, 4, and 5 above.

   Nevertheless, if the existing biomass industry is not sustained or expanded, there will be no financing available to support industrial-scale biomass industries of any sort. The lack of progress of biomass-to-ethanol will continue, and large-scale power generation using biomass gasification or digestion will be stymied if the synergistic aspects of pairing such new plants with existing biomass plants is not done. Existing plants have the biomass supply infrastructure in place, and biomass handling equipment available, and can provide steam and energy as needed for new processes. The costs of replication of these features will be unacceptable.

Finally, without a comprehensive biomass policy in California, the numerous biomass-related initiatives, concepts, and industries will remain frustrated, while the existing biomass power industry continues to shrivel.

10. The existing Renewable Portfolio Standard (RPS) law in California (SB 1078) does not appear to offer a realistic opportunity for expansion of the biomass power industry, because of utility opposition to all renewables outside their own portfolios, and the lack of a realistic mechanism to pay the costs in order to realize the environmental benefits of biomass power as discussed in item 7 above. It appears that, no matter the lip service provided, the lowest cost renewable will prevail and be developed. This will not include biomass power, unless policies directed at biomass fuels or power producers are also emplaced, sufficient in magnitude to allow biomass to compete with other renewables.