

BIOMASS POWER: A CASE OF NEGATIVE GREENHOUSE GAS EMISSIONS

All renewable power generation technologies are acknowledged to produce no net greenhouse gas (GHG) emissions, and to offset those of fossil fuel combustion. Biomass-fueled power generation is unique among renewable technologies in that it produces carbon dioxide (CO₂) emissions during normal operation, in fact, more than the fossil fuel emissions it is displacing. The difference is that its emissions result from combusting the current residues of society's agricultural, forestry and solid waste management activities, and its emissions are absorbed by the next crop of society's forestry and agricultural activities. Fossil fuel combustion, by contrast, emits carbon into the atmosphere that would otherwise remain locked away in geologic storage where it has been sequestered for millions of years.

The emerging story of biomass power, however, is that this technology actually reduces GHG emissions when the emissions from the alternate disposal fates of its fuel supply are taken into account. This is because landfilling, open combustion, or decomposition of biomass all release a fraction of the carbon, in a reduced form, methane (CH₄), which is recognized as a 25 times more damaging GHG on an instantaneous basis than the almost pure CO₂ emitted by biomass power facilities. The fraction released as methane varies from 5-50% of the total carbon depending on disposal method. Thus combusting pure methane to carbon dioxide, as occurs in a biomass power plant substantially reduces GHG potential in the atmosphere compared to not using the biomass wastes as power plant fuel.

This reduction in GHG emissions is greater than the reduction due to the displacement of fossil fuel, which is common to all renewable generation technologies. In a California study of biomass plants combusting a typical mix of agricultural, forestry and solid waste management fuels, the avoided GHG emissions from its fuel supply base were greater than the avoided fossil fuel GHG emissions.

The first regulatory body to recognize this benefit is the California Public Utility Commission (CPUC) which recently ruled in decision D.07-01-039, implementing SB1368, the California GHG emissions performance standard:

"In particular, the record shows that electric generation using biomass (e.g., agricultural and wood waste, landfill gas) that would otherwise be disposed of under a variety of conventional methods (such as open burning, forest accumulation, landfills, composting) results in a substantial *net reduction* in GHG emissions. This is because the usual disposal options for biomass wastes emit large quantities of methane gas, whereas the energy alternatives either burn the wastes that would become methane or burn the methane itself, generating CO₂. Since methane gas is on the order of twenty to twenty-five times more potent as a GHG than CO₂, and since methane has an atmospheric residence time of twelve years, after which it is converted to atmospheric CO₂, trading off methane for CO₂ emissions from energy recovery operations leads to a net reduction of the greenhouse effect."

Ultimately, if this value were to be recognized nationwide, biomass plants may be able to derive value from this unique public benefit in the form of carbon offset credits under a national cap and trade carbon compliance program. The magnitude of compensation may even be such as to arrest and reverse a decline in U.S biomass power generation that has seen 30% of the nation's biomass generation capacity close in the last 15 years due to inadequate compensation.

Until this system is in place, there is a short list of things that Congress can do to retain and expand the benefits of biomass power explained above:

1. Expand the Section 45 Production Tax Credit for existing and new biomass and other renewables so that parity is obtained with the level of current wind and geothermal payments, as envisioned in S411.
2. Eliminate the "netting rule" proposed by the IRS in Interim Guidance Notice 2006-88 that single-handedly eliminates biomass industry growth by severely penalizing the single most efficient and economic growth model for this industry, the combined heat and power (CHP) facility at an industrial site.