Policies and Incentives for Biomass Power to Become a Real Player in the Competitive Electricity Market

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ABSTRACT

Biomass has produced energy for hundreds of years, but only in the last 20 years has the production of electricity become viable. While biomass is plentiful and the benefits many, the industry has not grown at the rate of other, traditional generating sources. We will examine policy barriers renewable energy development has faced, and pose solutions that, in a new competitive market, could level the playing field with traditional generation. This paper reviews the federal policies in existence today, analyzes what several states have done, and discusses legislation that may be signed into law this fall.

INTRODUCTION

Biomass power is the generation of electric power from biomass resources—usually urban residues, crop and forest residues, and crops grown specifically for energy production. Biomass power reduces emissions, including greenhouse gases, compared with fossil-fuel-based electricity. Increased use of biomass for energy would reduce greenhouse gas emissions, lessen dependence on foreign oil, improve U.S. balance of trade, boost the rural economy, and support a major new American industry.

BIOMASS POWER MARKET TODAY

The existing biomass power sector, nearly 1,000 plants, is mainly comprised of direct combustion plants, with about two-thirds of those providing power (and heat) for on-site uses only. Plant size averages 20 megawatts with a biomass-to-electricity conversion efficiency of about 20%. Grid-connected electrical capacity has increased from less than 2,000 megawatts in 1978 to over 7500 megawatts in 2000. More than 75% of this power is generated by the forest products industry for their own industrial processes. In addition, about 3,300 megawatts of municipal solid waste and landfill gas generating capacity exists. The cost of generation with biomass ranges from 6 to 12 cents per kilowatt-hour, depending on the feedstock (residues or energy crops); with the development of highly efficient gasification units, the price could be driven down to 5 cents per kilowatt-hour.[1]

BIOMASS POTENTIAL

The U.S. has the land and agricultural infrastructure available to produce enormous quantities of biomass in a sustainable way—enough, for example, to replace half of the Nation's gasoline usage or all of the Nation's nuclear power without a major impact on food prices. Shifting part of the $50 billion now spent for oil imports and other petroleum products to rural America would have a profoundly positive effect on the economy, in terms of jobs created (for production, harvesting, and use) and industrial growth (facilities for conversion into fuels and power). The Energy Information Administration projects that the largest source of non-hydroelectric renewable energy generation will be from biomass. Electric generation from biomass power is projected to increase from 38 terawatt-hours in 2000 to 64 terawatt-hours in 2020, or 1% of the total electricity supply.[2]

BARRIERS TO DEVELOPMENT

If biomass has such tremendous potential, why aren't investors clamoring to develop biomass power plants? Many are, as a matter of fact. But many of these investors are backing companies who will develop overseas rather than in the United States. Europe, Japan, and

many other governments have determined that their emissions problems and power needs are such that renewable energy provides solutions that conventional generation cannot. They have invested heavily in research and provide substantial incentives to developers of clean energy resources. While the U.S. conducts some of the best research in renewable energy, the government does not facilitate the movement of technology past the demonstration stage into the marketplace. Investors and financiers are also hesitant to back plants for which a price of energy cannot be guaranteed. At this time, a policy solution is needed to close the gap between traditional and renewable energy generation.

POSSIBLE POLICY SOLUTIONS

Why aren't consumers provided energy generated from biomass power just as they are from nuclear, coal, and natural gas? We need to remember that traditional generation industries, when they started up, were and even today are, given tremendous incentives and subsidies to provide low-cost, reliable power. Consumers should have access to affordable, reliable energy that is also clean and sustainable. Unfortunately, sustainability and low emissions are not given the same value as bottom line cost. Economics will be the way to level the playing field; policies will need to be put into place that reward energy generators for using renewable energy sources. A production tax credit could be paid to generators (as it is with wind power today) per kilowatt-hour generated with biomass. Another policy would be to set a standard or requirement for generation, allowing that a certain percentage of generation comes from renewable energy resources, including biomass. Finally, continued research and development funding to find more efficient and cost-effective means of generating with renewable energy resources will be necessary to develop new and better technologies.

Current Federal Biomass Policy

Currently, a production tax credit of 1.7 cents per kilowatt-hour is given to producers of electricity who used "closed loop" (dedicated energy crops such as switchgrass) biomass and generation with poultry litter. Because no one has made energy crops economically viable solely for electricity generation, and because a poultry litter plant has

not started operation in this country, this credit has not cost the taxpayer one penny. In other words, no one can use it. The definition of biomass should include "open loop", meaning non-hazardous cellulosic residues from urban, forest, and agriculture waste streams.

State Initiatives

Several states have passed legislation that gives incentives for renewable energy and energy efficiency. In Maryland, a production tax credit for biomass and other renewable energy is in place. In Texas and in 11 other states, a renewable portfolio standard ensures that some portion of the electric generation in the state will come from renewable energy resources. All of these state incentive programs have met with overwhelmingly positive public support. Most are already oversubscribed; customers are simply waiting for more renewable energy plants to come on line. While it may take a couple of years for generators to begin using renewable energy sources, these incentives made it viable for developers to begin construction.

Federal Legislation Under Consideration

Congress has been working to pass serious energy legislation for 2 years. While each house has passed a bill, differences in the two versions will need to be reconciled in a conference committee. As with most other provisions, the biomass measures differ somewhat in the two bills. The Senate contains the most inclusive production tax credit, allowing for open and closed loop biomass, as well as co-firing with coal. The House includes only open loop biomass. The Senate also has a renewable portfolio standard that would require 10% of generation come from renewable energy sources by 2010. The House has no such renewable requirement. Both the House and Senate bills contain funding authorizations for important programs such as renewable resource assessment and biomass research and development. This funding, however, does not become "real" until appropriators put it into their spending bills.

CONCLUSION

Thus, while biomass power has the potential to continue to be the leader in renewable energy generation, only with policy incentives on a federal level will the industry truly take off and become a "real"

player in the electricity market. Several large petroleum companies are investing in renewable energy, and we can only hope that those corporations can help drive the market and enable legislators to realize that biomass is not a "fringe" technology but should be mainstream. One day consumers should be able to purchase all of their power from what would normally be considered a waste steam going to a landfill—and not go broke doing it.

References

[l] National Renewable Energy Laboratory, 2002 Fact Sheet.
[2] Energy Information Administration, DOE/EIA-0383 (2002), December 21, 2001.

ABOUT THE AUTHOR

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