

Alternative Energy Credits and CHP in Pennsylvania

Biomass Combined Heat and Power Systems

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Topics for Discussion

- What differentiates fuel types?
- What market changes are in play
 - A bit of History
- What is Proper Valuation



Attributes:



Generation Attributes

Fossil

- Limited Resource
- Air Emissions issues
- Water management issues
- Centralized Siting
- Promotes Centralized Economic Opportunities
- Others?

Renewables

- Unlimited Resource
- No Air Emissions
- No water Management issues
- Local Siting
- Promotes Decentralized Economic Opportunities
- Others?



What has been enacted?

- Utility Restructuring, 1996
- Alternative Energy Portfolio, 2004
- SS House Bill of 2008
- Act 129 of 2008

All of which have 2011 as a target year



A Look At History; Electricity and Economics

- Early Electrification Circa 1900



Street Lighting



Public Transportation



Industrialization



Vs. Large Scale “Interstate” Generation



Shift back to Small Scale Systems



Alternative Energy Credits

- Alternative Energy Credits level the playing field between kilowatt-hours sourced from fossil fuels and those produced from renewable sources
- A Credit is issued for each 1,000 kWh produced from a renewable resource



Qualifying Resources

- Wind
- Low Impact Hydro
- Geothermal
- Biogas
- Biomass
- Fuel Cells
- Coal Mine Methane



Example Valuation: Waste Coal

1 Mw plant, 90% Capacity, 35% Eff.

8760 hrs X .9 cf = 7,884 mWh/Year

\$204,960/ year @ \$40/ton

7,884 mWh

2.6 Cents/kWh



Biomass Fuels

- Wood Pellets @ \$125/ton = 7.4 Cents/kWh
7.4 Cents - 2.6 Cents = 4.8 Cents/kWh or
\$48.00/Credit
- Switch grass @ \$100/ton = \$37/Credit
- Dry wood chips @ \$80/ton = \$30/Credit
- 50% mc wood chips @ \$35/ton = \$14/Credit



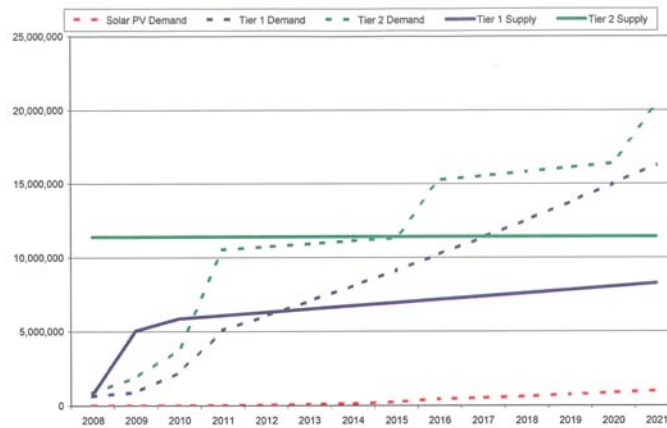
Recent Market Price

2008/2009 Average: \$3.63 \$0.00363/kWh

Range: \$0.50 - \$23.00



AEPS Estimated Marketplace (MWhs)
Based on PA PJM Queue Dated April 17, 2008



If all of the foregoing assumptions hold, there will be enough Tier I capacity to meet demand through 2012. There should be enough Tier II capacity to meet demand through 2015.



Conclusion:

- Alternative Energy Credits can stimulate growth
- Properly valuing generation attributes is critical
- Technology, Demand, and Timing favor establishment of the biomass industry

