

# Biomass Energy Demonstration Grant

Lansing Board of Water & Light  
September 2010

# Lansing Board of Water & Light

- The BWL is a municipal utility owned by the citizens of Lansing
- Largest municipally-owned electric utility in Michigan and among the 30 largest in the U.S. (96,380 customers)
- Largest groundwater sourced drinking water system in Michigan (54,840 Customers)
- Also serve the Lansing downtown district with steam heating and chilled water

# Objectives of Project

- Demonstrate the ability of biomass to be used as a sustainable renewable fuel
- Procure a biomass fuel that could be blended at a 10% ratio with traditional coal
- Test the biomass fuel in an existing utility-sized pulverized coal electric generating plant

# Public Act 295

- Effective October 6, 2008
- Also known as the “clean, renewable, and efficient energy act”
- Requires all electric utilities in Michigan to meet a renewable portfolio standard (RPS)
- RPS calls for 10% of annual retail sales must be generated by a renewable energy source by the year 2015

# RPS Plans for the BWL

- Currently the BWL has approximately 5% of retail sales in renewable energy resources
- Next phase is to procure a biomass fuel that can be co-fired in existing pulverized coal generating plants

# BWL Electric Generation

- Pulverized coal (PC) fired steam generators
- Major consideration of burning biomass in a PC boiler is matching the grinding properties with the capabilities of the existing pulverizers
- Optimum biomass fuel will have similar properties to coal

# Project Implementation

- Procurement and delivery of biomass fuel
- Development of testing procedures
- Coordinated efforts from other organizations
- Perform test burn and compile results
- Summary and next steps

# Procurement of Biomass Fuel

- Purchased 100 tons of E-Coal
- E-Coal is a biochar made from wood
- Properties similar to coal
  - Low moisture and ash content
  - Grindable in existing pulverizers
  - Can be stored unprotected outdoors
  - Can be mixed with wet coal

# E-Coal Picture

- E-Coal in small piles. Coal piles in rear on left and right.



# E-Coal Picture



# Development of Procedures

- Procedure for unloading the biomass fuel and the blending with coal
- Utilized empty coal cars and loaded with alternating pattern of coal & biomass
- Test burn procedures developed for plant personnel

# Coordination Efforts

- Air Use Permits required by Dept. of Natural Resources and Environment
  - Permit required for each fuel type, from each fuel supplier and for each power generating unit
- The BWL met with several biomass vendors during the process
- Funding from the Michigan Department of Energy, Labor and Economic Growth, Bureau of Energy Systems (BES)

# Perform Test Burn

- E-Coal was delivered on August 30, 2010 from Quebec, Canada
- Test burns performed on September 2<sup>nd</sup> and 3<sup>rd</sup>, 2010
- Collection of data and compiled results

# Summary of Biomass Fuel

- Could be blended with coal and stored together for multiple days without any degradation or combustion issues
- Blended fuel flowed well through existing coal unloading, handling and delivery systems
- Mills ground the mixed fuel with limited degradation in performance
- Fuel mixture was dustier than coal and precipitator showed an increase in average opacity during the 4 mill test

# Next Steps

- Perform additional test burns with continuous co-firing of the blended fuel at full load for approximately 7 days
- Continue to evaluate other torrefied wood products from various vendors

# Questions and Contact Information

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