Central MN Ethanol Co-op

Little Falls, MN

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Central MN Ethanol Co-op
General Manager

Project Objectives

- Comply with air permit agreed on in the Consent Decree between CMEC, Department of Justice and the MPCA
- Evaluate technologies to reduce risk in the natural gas market and reduce exposure to the DDG'S market
- Protect shareholders investment in CMEC

Gasification

- is the process for converting a solid fuel to a fuel gas or syntheses gas under oxygen starved combustion
- separates carbon and hydrogen from ash at 1600 degrees F.
- the resulting gas is carbon monoxide, hydrogen and nitrogen

Gasification

- Combustion is complete by mixing with air from dryer exhaust
- The low Btu gas is used much like natural gas
- Wood ash is an excellent liming source to increase soil fertility

Wood as a Fuel Source

- Wood waste is being land filled
- Forestry industry needs to remove 2/3 of slash to enable a quicker and healthier regeneration of the forest. Burning is restricted.
- Tree services experience high cost of disposal of wood chips from disease, yard and storm damage clearing.
- DNR would thin their forest for healthier growth
- Saw mills sell small amounts for bedding
- CMEC evaluated wood waste, corn stover, switch grass, corn, DDG'S corn syrup, coal, or ethanol

Why Primenergy?

- Proven record of thermal oxidizers and gasification
- Their gasification provides an energy source of steam and power generation and will reduce emissions more efficiently than a thermal oxidizer

Sources Of Fuel

Wood Waste

- Saw Dust from saw mills in the area
- Slash or tops and branches from the lumber industry
- Offal or tailings from wood industry
- Storm damage, tree trimmings and yard disposal

Secondary Fuel Source

CMEC will apply for permission to gasify ddg's

Third and Last Resort

Resort back to natural gas.

We will have the ability to burn gas through the thermal oxidizer bypassing the gasifier or to re-fire the boilers

Other Sources

- Corn Stover
- Switch Grass
- Other Biomass

Heating Values

- Hardwood – 8561 Btu/lb on a dry matter basis
- Aspen – 8,284 Btu/lb on a dry matter basis
- DDG without syrup – 13.35% moisture 8,473 Btu/lb. 9778 Btu/lb. on a dry matter basis.
- Stover – 6215 @ 15% moisture
- Corn – 6800 @ 15% moisture

Comparative Heating Values Btu Per Pound

- Multiply corn price per bushel by 41.9 to get equivalent DDGS price per ton
- 2.62 bushels of corn contains 1 MMBTU
- Corn at $1.75 per bushel has the same cost per MMBTU as DDGS at $73.32 per ton
- Multiply stover price by 1.3 to get equivalent DDGS price
- Stover at $50.00 per ton has the same cost per MMBTU as DDGS at $65.00 per ton

Securing Wood as Fuel

- Ten year contract
- Sliding scale that adjusts for moisture content
- Incentive is lower the moisture, the higher the value and the lower the tons needed to produce the Btu's

Wood Usage

- Committed to 150 ton per day up to the total needs which will be dictated by the gasifier
- Estimated to be between 250 and 280 ton per day
- CMEC will apply to burn DDG

Grants

- 2 million dollar grant from the USDA
- 2 million dollar grant from XCEL Energy

Future For Ethanol Plants

- Evaluate the changes and opportunities for your ethanol plant
- Many good ideas but with high capital cost. Your forest might be corn stover, switch grass, feedlot manure or other biomass that is readily available

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