



# Application of Biomass Gasification at Central MN Ethanol Coop

*Presented To:*

“Managing High Energy Costs:  
Discussion of Alternatives and Opportunities”

*Presented By:*

Michael Sparby, AURI  
&  
Cecil Massie  
Sebesta Blomberg & Associates

**May 16, 2006**



- The CMEC Challenge
- Introducing Sebesta Blomberg
- Biomass Gasification Solution
- Economic and development benefits



- CMEC was under mandate to reduce emissions
- Known thermal oxidizer technology would increase natural gas use
- Rising natural gas prices were already squeezing profits
- Novel solution had to be found

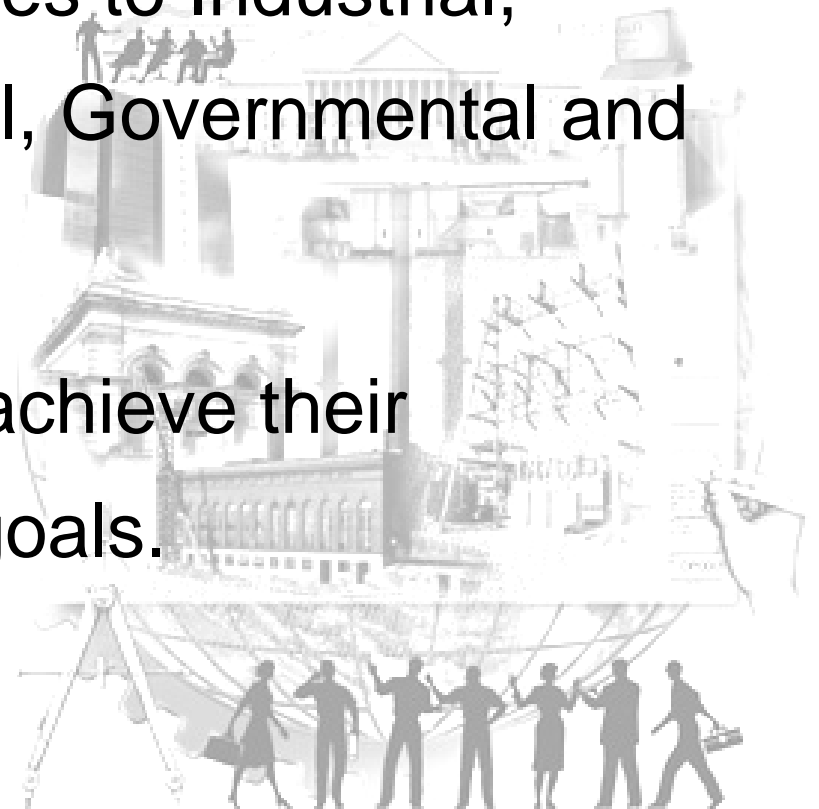


- Achieve regulator compliance with VOC emission limits
- Reduce cost of operation
- Protect shareholder equity now and in the future



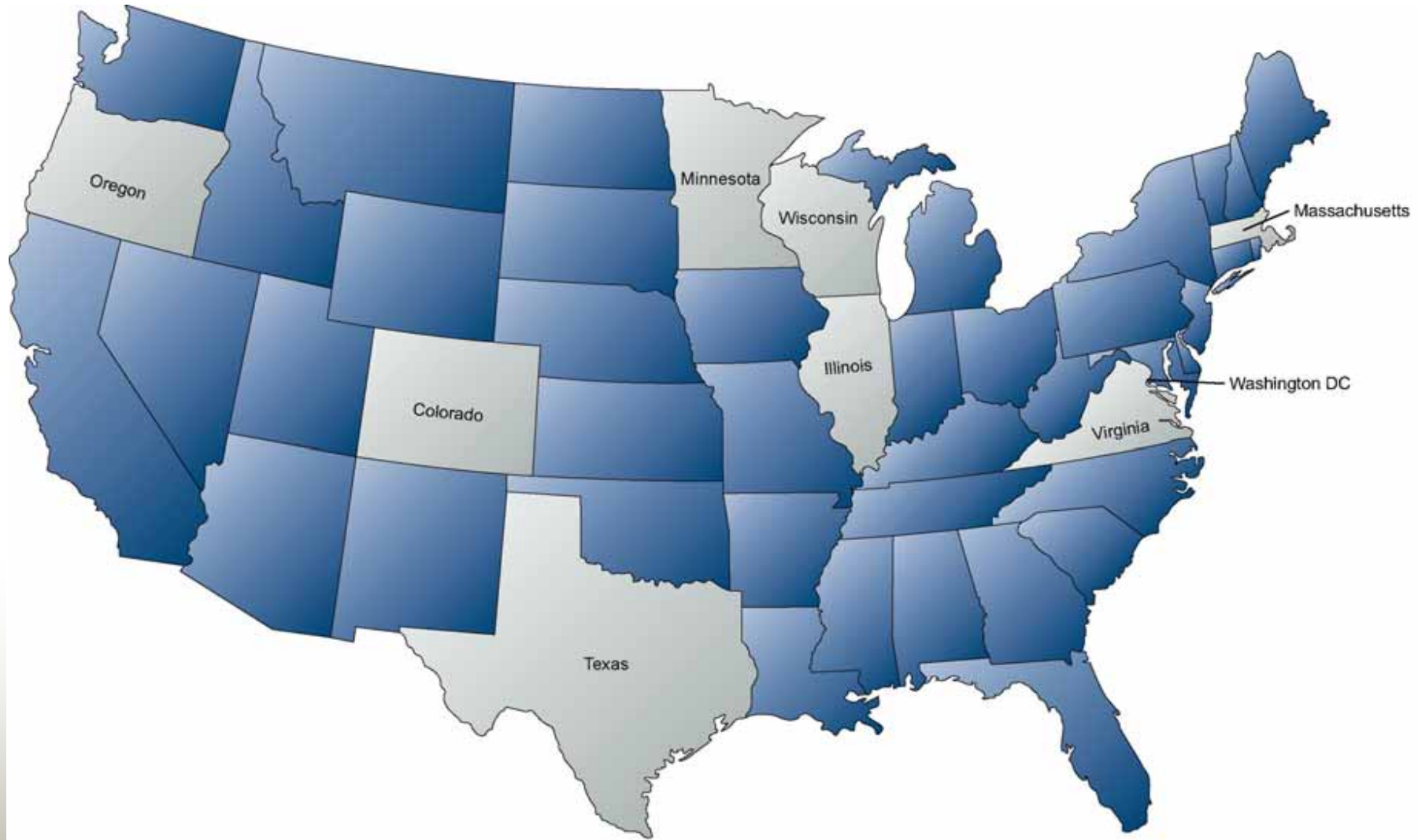
Founded in 1994, Sebesta Blomberg provides Facility Management, Consulting, Engineering and Design/Build Services to Industrial, Institutional, Educational, Governmental and Healthcare customers.

Helping our customers achieve their technical and financial goals.





# *Office Locations*





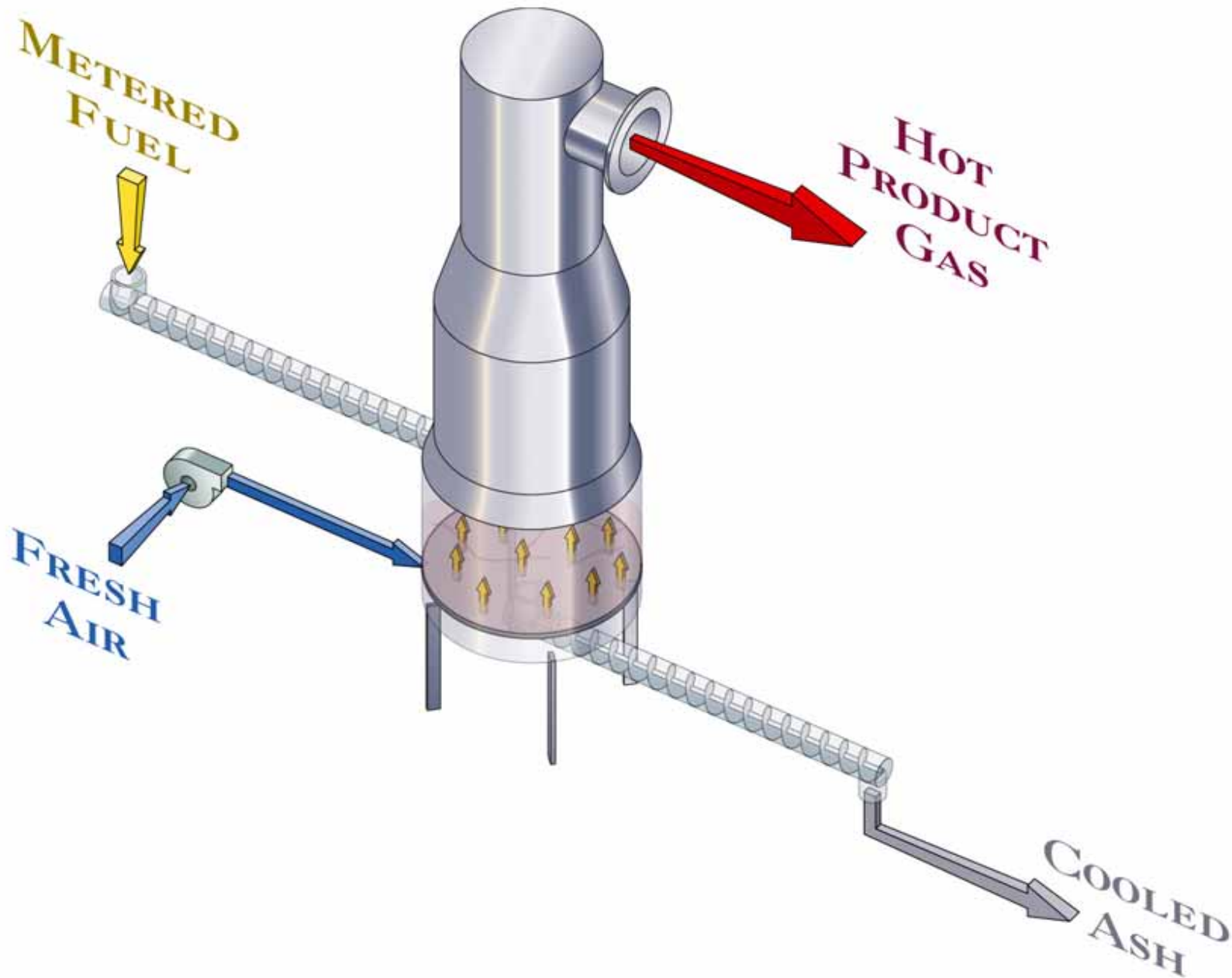
- Thermal oxidation is proven technology for VOC reduction
- Opportunity is in not using natural gas
- Gasification is proven technology for fuel gas production



- Oxygen starved partial oxidation of solid fuel
- Produces synthesis gas, a mixture of carbon monoxide and hydrogen
- Synthesis gas is a substitute for natural gas

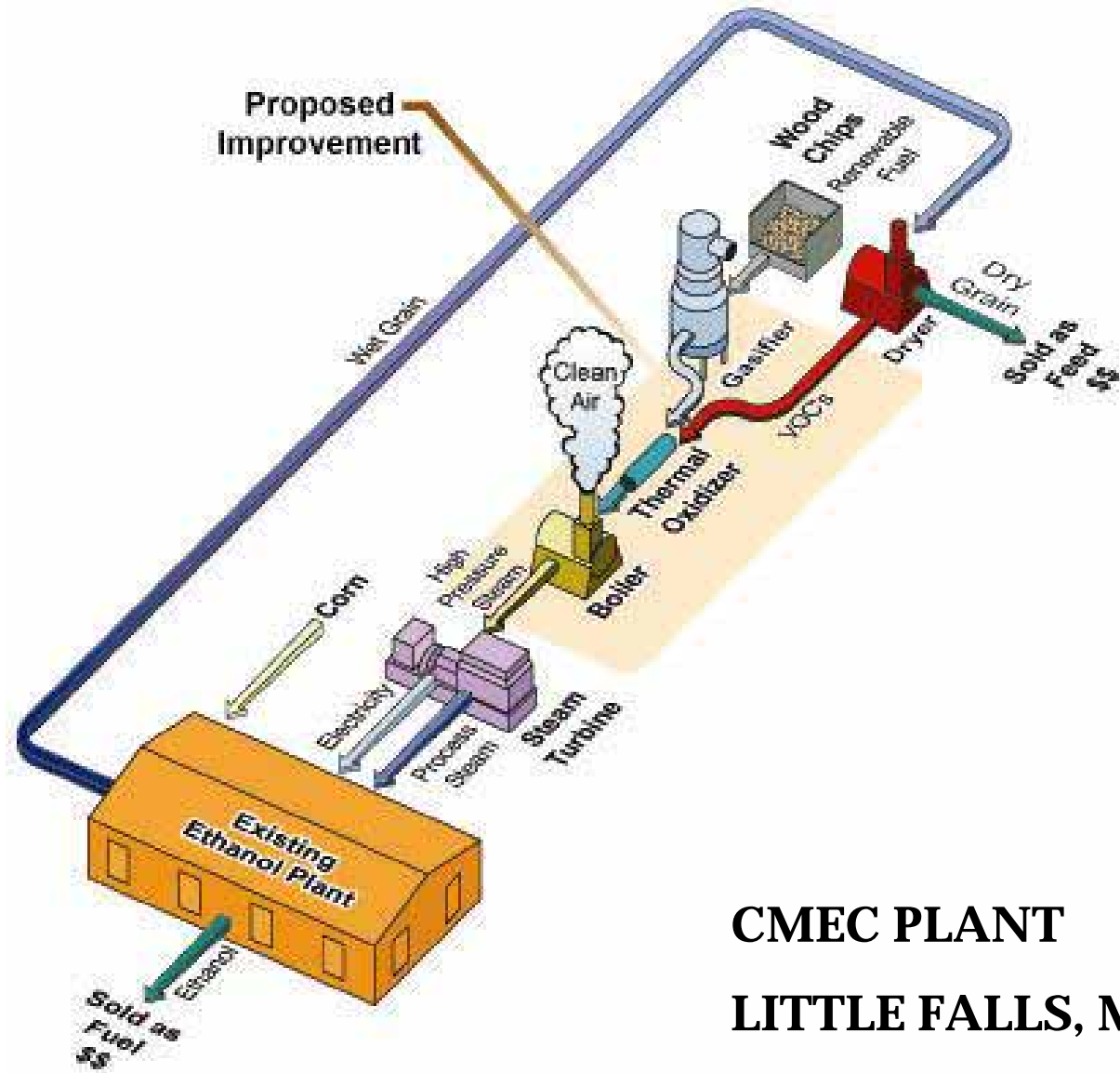


# *Gasification Technology*





- Distillers grains – contains nearly enough energy to meet plant energy needs
- Corn Stalks – Each acre of corn produces enough biomass to convert the grain to ethanol
- Wood waste/wood chips



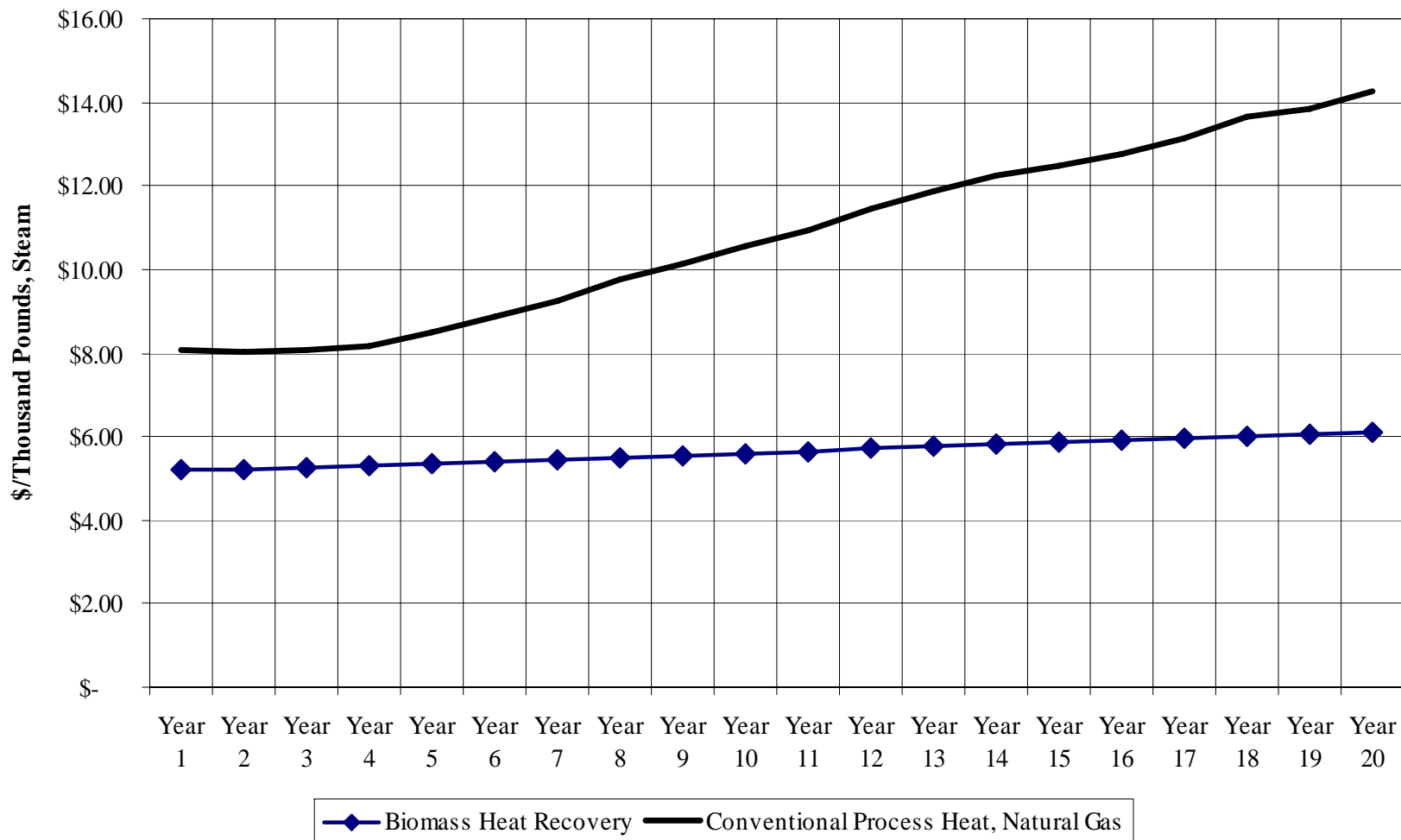
**CMEC PLANT  
LITTLE FALLS, MN**



- Ethanol plants are proven economic development vehicles
- Biomass fuel puts about \$2.5 million in local economy
- Stabilizes energy costs for the long term
- Creates a sustainable competitive advantage



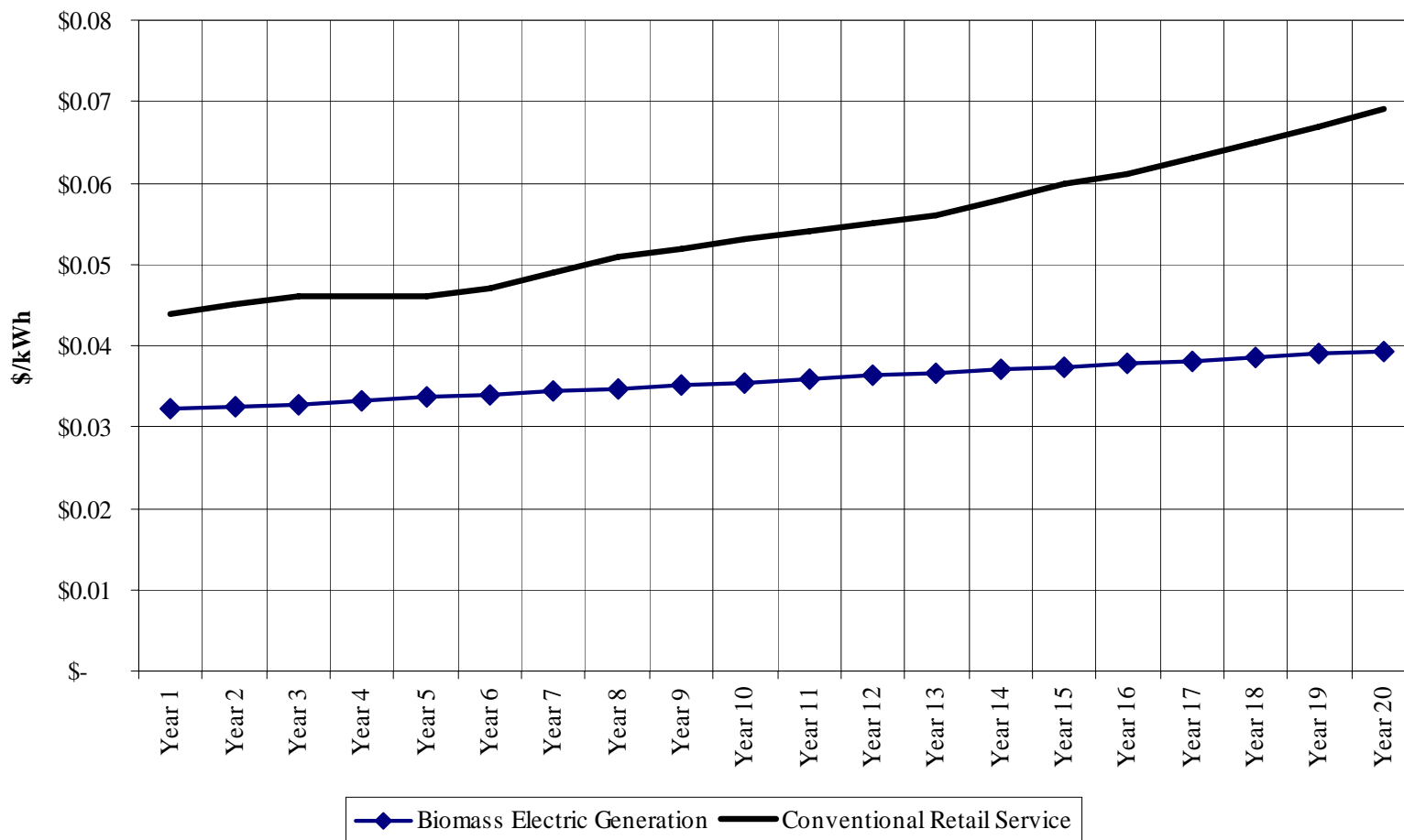
# Comparison of Costs: Process Steam



Biomass Heat Recovery reflects 75% allocation of operating expenses including fuel, incremental labor, lime, interest and depreciation.



# Comparison of Costs: Electricity



Biomass Electric Generation reflects 25% allocation of operating expenses including fuel, incremental labor, lime, interest and Depreciation, plus a full allocation of stand-by service charges and turbine generator maintenance expenses. Interest and Depreciation are based on total capitalized project cost of \$30.37 million. The term of debt is 20-years at 6% interest. Depreciation expense reflects a 20-year straight line basis.



- Biomass is a technically feasible substitute for natural gas
- Economic returns are attractive today and expected to become more so over time
- For farmers supplying stover to the plant, there would be significant economic gain



# *Thank You*



**Offices Worldwide**

[www.sebesta.com](http://www.sebesta.com)