



Fond du Lac Band of Lake Superior Chippewa
Biomass Co-generation & Wood Pellet Production Project



FDL Wood Pellets Overview

Fond du Lac Band of Lake
Superior Chippewa

Fond du Lac Band of Lake Superior Chippewa

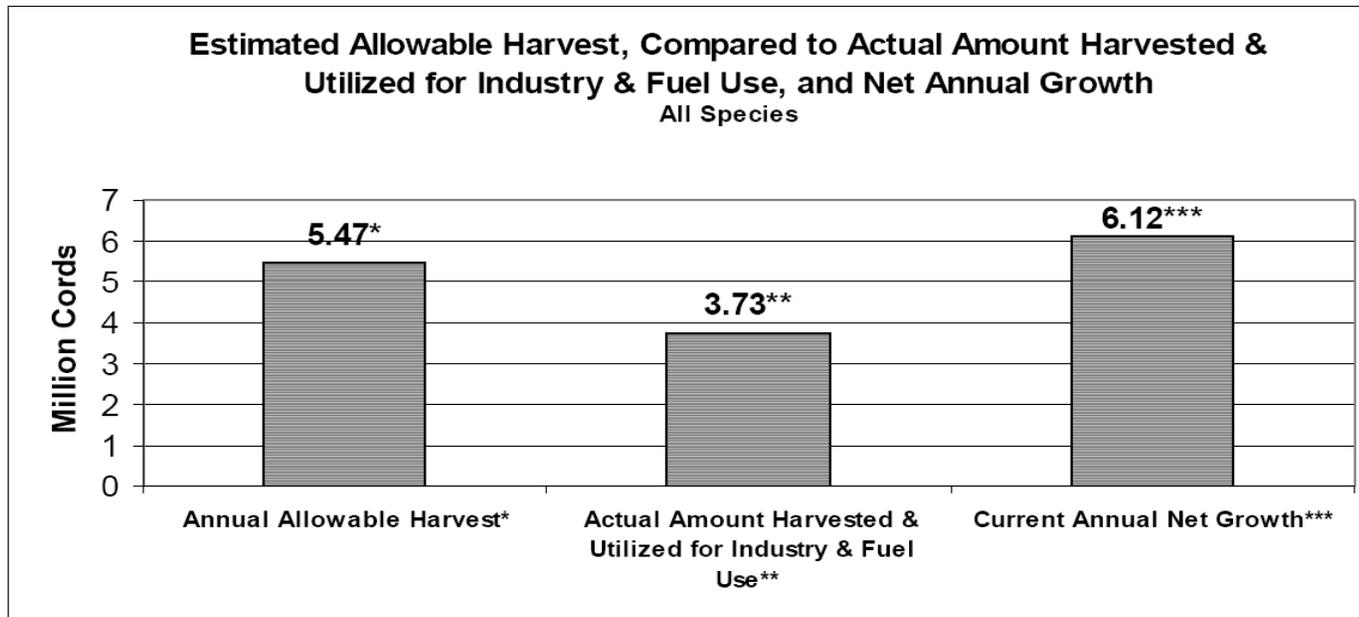
- Largest employer in Carlton County, Minnesota
- 4200 members
- Fond du Luth Casino in downtown Duluth & Black Bear Casino Resort in Cloquet
- Pursuing a 100,000 tons per year wood pellet plant that would employ 23 people, 40 loggers and truckers and about 12 people in a retail pellet appliance business

Local benefits of biomass

- Studies show that 95% of Fossil Fuel dollars leave the community, while 75% or more of biomass dollars stay in the community
- About 290,000 homes in Minnesota use fuel oil or propane
- Need to reduce forest fire hazard and create sustainable jobs
- Economic & employment diversification

Minnesota has 15 million acres of cost effective and clean woody biomass

2005 (OSB peak) harvest level at 3.73 million cords, current harvest is probably about 2.7 million cords.



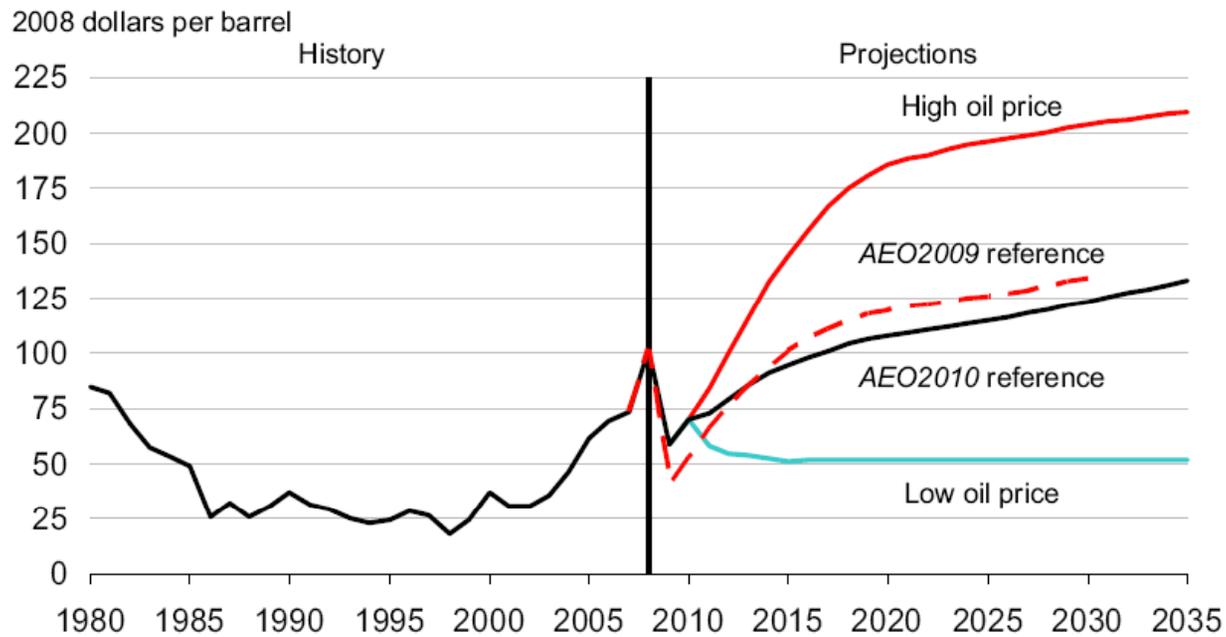
*Table 6.25, GEIS, High Long-Term Sustainable Level, Maintaining Forest Productivity Tech. Paper, Dec. '92.

** 2005 NFES Pulpwood Survey, 2004 DNR Sawmill Survey, 2002-03 Fuelwood Survey. For Harvest comparisons to Net Growth, it is necessary to add annual "growing stock" logging residue of approximately 275,000 cords to this figure.

***USFS FIA 2005 Database.

DOE predicts energy prices to rise...

Oil prices in the reference case rise steadily; the full *AEO2010* will include a wide range of prices



Building Heating Fuel Comparison

Fuel	Cost per unit	Cost per mmBtu (adjusted for efficiency)	Approximate Net lbs CO₂/mmBtu
Bulk Pellets	\$160/ton	\$10.77	0
Nat. Gas (residential)	\$1.06/therm	\$12.93	117
Retail Pellets	\$200/ton	\$13.47	0
Propane	\$2.29/gallon	\$30.49	139
Fuel Oil	\$3.20/gallon	\$27.94	161
Electricity	\$0.09/kWh	\$26.37	600 (coal based)

Not the pellets or appliances from the 80's...

- US chip and pellet boilers from the early 1st generation and suffered from lack of design expertise
- Europe kept energy prices high during the 80's & 90's and built successful pellet manufacturing and appliance industries through:
 1. Consistent Pellet Quality
 2. Heavy Duty Equipment



Fond du Lac Biomass Business Plan

Enter the Renewable
Energy Business as the
1st US producer of
sustainable and stably
priced wood pellets
using proven European
co-generation and low
emission technologies



Fond du Lac Biomass Business Plan: District Heat, Co-generation & Wood Pellets

March 11, 2010

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Engineering Study

- Completed in August,
- Quotations on all major equipment and detailed installation estimates
- Detailed Spreadsheets, drawings, brochures, reference material



Wood Pellets, District Heat & Co-generation Engineering Study

August 12, 2010

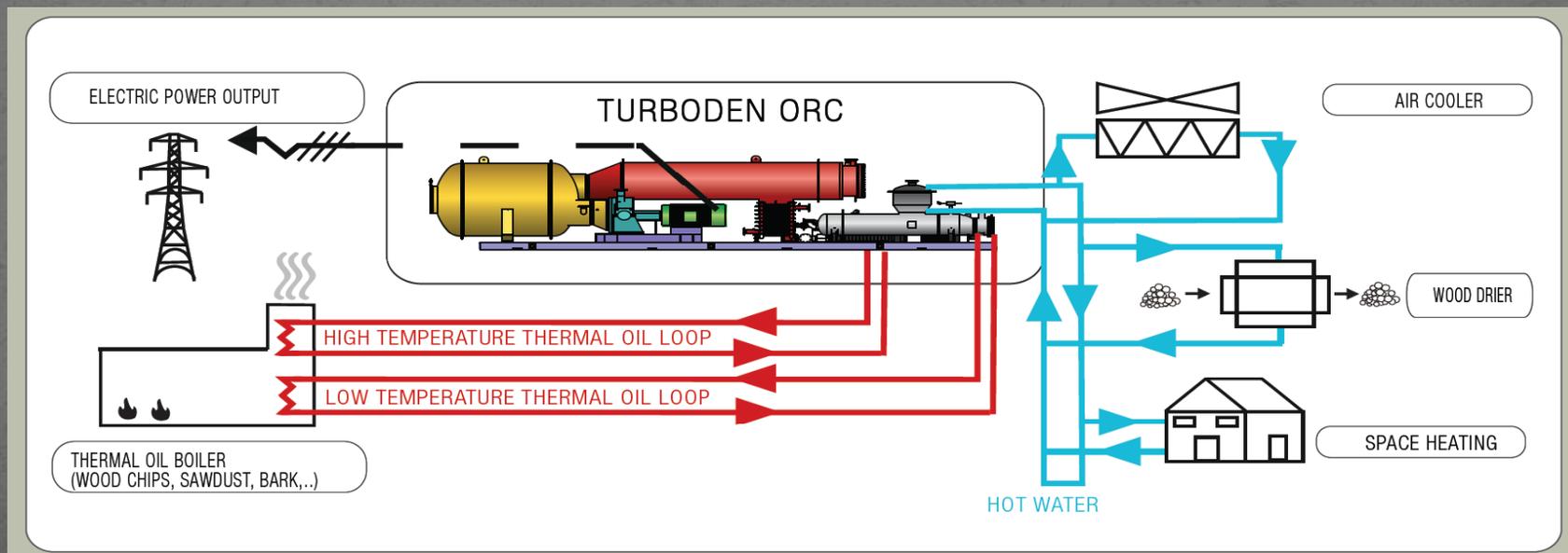
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Biomass Binary (Organic Rankine Cycle) Power

- Wood combustion heats a thermal oil to 600°F
- Hot thermal oil vaporizes an organic fluid (silicon oil) which spins a turbine & generates electricity
- Turbine cooling water is heated to 175°F, suitable for district heat and drying pellet feedstock



Key Strategies

- **Develop a wide business moat by:**
 - Being the Regional Low Cost Producer of premium pellets
 - “Green e” Certified Pellets (made with renewable electricity)
 - Loyal Customers (high quality pellets at a steady price)
 - Key Strategic Partners (Como Oil, Wood Master)
 - Become Logger preferred customer

Next Steps

- Marketing Study, Tax Study and Permitting in process
- Have to find market for at least 60% of production capacity (eventually 70% would be consumed internally)
- Looking for customers...