West Fraser Bio-Conversions

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West Fraser

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About West Fraser

An integrated solid forest products company primarily focused on wood products

- Founded in 1955 in Quesnel
- Core business is producing lumber, plywood, laminated veneer lumber (LVL), MDF, pulp and newsprint
- 7,000 employees in more than 35 operations in Western Canada and across the Southern United States
- North America’s largest lumber producer, Canada’s largest plywood and 3rd largest market pulp producer
Sustainable Resource

- Managed forests key to business
- Saw logs provide highest value
- Pulp logs are included in the harvest
Primary Conversion

- Lumber mills convert high value timber to construction grade solid wood products. Sawdust, shavings, wood chips and bark are byproducts that provide significant value.
Engineered Wood (LVL, Plywood)

- Peelers (high quality saw logs) are used to produce engineered wood products
- These products are composites of wood and resins
Engineered Wood (MDF)

- Sawdust is used to produce medium density fibre board.
- These composites of wood and resin can be used to produce a variety of products from moldings, to cabinets and furniture.
Kraft Pulpmill

- Residual chips from the lumber mills are converted to pulp in our Kraft pulp mills using chemicals.
- Pulp liquors contain all non-cellulose components of the biomass.
Biomass Fuel Conversion

- Beehive burner for waste disposal all our lumber mills used them most have been converted to thermal heat systems
- Two remain in operation, two are on standby

- Thermal Oil Units burn biomass to displace natural gas used for lumber drying
Traditional Power Generation

- Pulp mill Power boiler and Steam Turbine
BIO Initiatives

Forest Products
- Lumber (Sawlogs)
- Veneer (Peelers)
- Plywood
- LVL
- MDF (Sawdust)
- Pulp (Chips, Pulplog)

Bio Products
- Lignin
- Biocomposites
- Bio Resins
- Bioplastics
- BioChemicals

BioEnergy
- Gasification
- Torrefaction
- Pyrolysis
- ORC Application
- Biogas
- BioDiesel
- Methanol
- Tall Oil Products

Energy
- Biomass Boilers
- Recovery Boilers
- Thermal Oil Systems
- Heat Recovery

Value

Economic Anchors

Transformation

Capital
- Funding Programs
- Resources

New Products
- New Technology
- R&D
Key Requirements of Bio Initiatives

- Meet business objectives
  - Economically competitive return
  - Be sustainable without subsidy
  - Compliment our environmental sustainability requirements
- Synergy with operations
- Be commercial or near commercial stage of development
- Market for outputs
- Availability of Inputs
- Simple to use
Current Initiatives

- **Energy is a focus**
  - 10 MW Biomass plants at Chetwynd and Fraser Lake
  - 5.3 MW Biogas Plant at Slave Lake Pulp
  - Tall Oil used for green Energy at Cariboo Pulp
  - Green Transformation funds used to reduce steam and generate more electricity in steam turbines at Cariboo Pulp and Hinton Pulp

- **Effluent treatment Biomass used for land application**

- **Research**
  - Bio-refinery conversions at Hinton with Ecole Polytechnique et al
  - Bio-composites at AITF
  - Composting Olds college
  - MDF quality improvements AITF
Turboden ORC Unit

- New Biomass energy systems being applied at lumber mills to eliminate use of Beehive burner
Anaerobic Effluent Treatment
Biowaste for Soil Enhancement

- Disposal of effluent biomass costly as difficult to dry to a combustible moisture content
- Land application or composting two viable alternatives
Future Opportunities

Pulp Liquor refining
- Liquor is a complicated soup of inorganic and organics
- Tall oil can be removed from liquor. It is currently burned but can be refined to produce other products
- Lignin can be used in resins
- West Fraser has market for resin used in Engineered wood products
Bark and residuals

- Most economic use of bark is combustion to produce energy
- Roadside residuals not economic for producing electricity
- Opportunity is to develop high value uses of bark
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