

Bioproduct opportunities for Forest Products

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About West Fraser

West Fraser is an integrated forest products company primarily focused on wood products

- Founded in 1955 by three brothers – Bill, Sam and Pete Ketcham - in Quesnel, BC
- Expanded to Alberta in 1989
- \$3.5 Billion in sales



Technology, Byproducts and Bioproducts at West Fraser



Lumber mills convert high value timber to construction grade solid wood products – lumber, plywood and engineered wood products

Sawdust, shavings, wood chips and bark are byproducts that provide significant value – as pulp, MDF and energy

The bioproducts future: biofuels, biochemicals, biomaterials

LignoForce Extraction Plant at Hinton, AB

- Innovative first of kind application in Canada for commercial demonstration plant
- Technology developed in Canada at FPI and proven at pilot plant in Thunder Bay by FPI Innovations and Noram Engineering
- 30 T/day Plant build started, commissioning starts mid 2015
- Integrated forest products opportunity with Plywood, LVL, MDF and OSB producers
- Can be integrated with a integrated strategy to develop lignin as a green chemical for replacement of petrochemicals
- Focus is on reproducible and consistent product quality, with predicted reactivities.

Kraft Lignin



- Consolidated Cake Form



- Dry Powder Form

Opportunities Arising From Development

- Opportunity to advance bio-industrial development
- Potential as a green, lower cost petrochemical alternative for aromatic phenolic, carboxylic and aliphatic group chemistries.
- Opportunities to create a new revenue source for forest and agricultural biomass users.
- Create new opportunities and synergies among various industries and the applied research community by collaborating on the development of lignin.
- Resin replacement in plywood and OSB reduces GHG emissions by 1.4 to 2.8 tonnes CO₂e per tonne of lignin consumed.

Potential uses

- Oil and Gas applications
 - Drilling fluid additive, corrosion inhibitor, oil recovery enhancer, surfactant for mine, oil tailings
- Construction
 - Asphalt extender, concrete admixtures, non-wood resin applications
- Thermoplastics
 - Wood plastic composites, rubber compounds, activated carbon, carbon fiber, advanced composites and specialty chemicals
- Biochemicals
 - Dispersant, surfactant, variety of polyols, hard & soft foams for insulation
- Phenol Formaldehyde resins
 - Plywood, OSB, LVL, MDF, replacement of binders and extenders

Summary

- Build commencing for 30 T/day commercial demonstration lignin plant in Hinton.
- Opportunity to develop innovative biomaterial applications with commercial quantities of lignin biopolymer through AITF and FP Innovations.
- Unique opportunity to develop novel applications for a broadly available biomaterial.
- Wider and higher value opportunities exist but these will take time and requires greater market pull.