

## Kraft Lignin Innovation Forum

October 11<sup>th</sup> & 12<sup>th</sup>, 2017

Iron Mountain, Michigan

W6791 US-2,

Verso, Quinnesec Mill, Multi Purpose Conference Room

In the near future, Lignin separation and valorization is expected to be standard technology at all kraft pulp mills. However, each mill has different feedstock and processing that creates different lignin, therefore, development of technology platforms will be unique for each mill. Cost competitive business models need to be developed with potential customers and with those across the whole value chain. Whether a byproduct of papermaking or residual from biorefineries, the Michigan bio-circular economy is in need of creating value from lignin.

This forum intends to bring researchers and companies from across Michigan (and beyond) to learn first hand the availability and opportunities surrounding residual black liquor from Michigan's largest pulp producer. This meeting will be kept small (~15 attendees) to encourage discussion that explores and business possibilities and key research needs. This meeting will kickoff the creation of an informed network of businesses, researchers and government, focused on pulp mill byproducts that cuts across sectors of the economy. MIFBI will serve to guide the network toward opportunities in the Michigan bioeconomy.

### **Special Invited Guest - Kirsten Maki, P. Eng.** *Bio-economy Technology Centre, FPInnovations, Thunder Bay, ON*

Kirsten Maki has a degree in Chemical Engineering from Lakehead University. She worked as a process engineer and shift supervisor at the Resolute mill in Thunder Bay, Ontario before joining FPInnovations in 2009. Her work at FP Innovations' Bio-economy Technology Centre (BETC) in Thunder Bay has focused on scaling up the extraction of co-products from wood pulping including lignin, methanol and sugars. The kraft lignin extraction process piloted at the BETC has been commercially deployed as the LignoForce process.

### **Agenda Overview** (The agenda was arranged to accommodate flight schedule from Detroit to Iron Mtn.)

#### Wednesday Oct 11<sup>th</sup>

11:30am – 12:30pm	Lunch and Introductions (Mark Rudnicki, MIFBI & Steve Brooks, Verso)
12:30 – 1:30pm	Presentations by Verso Corporation & group discussion
1:30 – 2:30pm	Short presentations by industry attendees & group discussion <b>Julie Manly, Guiding Green – Rethinking the value chain for a circular economy</b> <b>Donna LaCourt, MDARD - Overview of MI Forest Product sector</b> <b>Warren Suchovsky, Michigan Asso. Timberman – Perspective from the forest</b> <b>Alper Kiziltas, Ford Motor Company – Sustainable Materials for Automotive Applications</b> <b>Brad McPhee, Creative Composites – A market for lignin carbon fiber</b> <b>Shakti Mukerjee, Resinate Materials Group – Sustainable Lignin Polyester Polyols</b>
2:30 – 3:00pm	Break
3:00 – 4:30pm	Tour of Verso Quinnesec Mill
5:00pm- 6:30	<i>Private Cocktail Reception at Historic Chippewa Club (106 Carpenter Ave, Iron Mountain, MI)</i>
6:30pm	<i>Dinner on own (Chippewa Club recommended)</i>

Thursday Oct 12<sup>th</sup>

8:30am – 9:30am	Special Invited Guest – Kirsten Maki, PEng. , FPIInnovations  'Lignin Application Development, and scaling up the LignoForce process'
9:30 - 10:30am	Short presentations by University faculty - interests and expertise <b>David Shonnard – Chemical Engineering, MTU - Guiding Sustainable Development in the Forest Bioeconomy: Environmental Life Cycle Assessment</b> <b>Eric Hegg – Biochemistry and Molecular Biology, MSU - Strategies for Developing Clean Lignin Streams and Subsequent Depolymerization</b> <b>Rebecca Ong, Chemical Engineering, MTU – Utilizing Lignin's Inherent Properties for the Production of Value-Added Products</b>
10:30-11:00	Break
11:00 - 11:30am	(Cont) Short presentations of Univ faculty interests and expertise  <b>Mojgan Nejad – Forestry, MSU – Developing Lignin-based Resins for Adhesive, Coating and Foam Applications</b> <b>Mike Mullins- Chemical Engineering, MTU – The production of renewable fuels from lignin- a perspective from Sweden</b> <b>Xinfeng Xie – Forest Resources &amp; Environmental Science, MTU – High glass transition lignin for carbon fiber production</b> <b>Wen Zhou- Chemical Engineering, MTU – Process modeling and Life-cycle assessment of biomass conversion</b>
11:30 – 12:30	Working lunch and continued discussion
12:30 – 2:00	Outlining steps of how to move forward
2:00pm	Wrap up of meeting
2:00pm - 5:00pm	Potential Extra to meeting: Individual or breakout group meetings by own arrangement