Facilitating Canadian Forest Sector opportunities in emerging bio-products

12th Annual World Congress on Industrial Biotechnology

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Overview

• NRCan suite of forest sector programs

• Investments in Forest Industry Transformation (IFIT)

• Canadian forest sector examples

• IFIT’s 3rd Call for Proposals and going forward
Government of Canada’s support to emerging forest bioproduct opportunities …

NRCan’s suite of policy and programs dedicated to forest industry transformation from lab to market…

**Market penetration**

- **Basic and Applied R&D**
  - Forest Innovation Program
  - Work with FPInnovations & CanmetENERGY
  - Aligning academic R&D with industry needs

- **Pilot**
  - Support for tall wood buildings

- **Demo to Commercial**
  - Pulp and Paper Green Transformation Program
  - Investments in Forest Industry Transformation Program

- **Commercial Products**
  - Expanding market opportunities
  - National building code modernization

**Technology and products**
Dedicated funding for commercialization of new bio-products opportunities… IFIT

• $100M from 2010-2014 to invest in innovative technologies to support a more diversified, higher-value product mix in the forest sector.
• Targeted towards bioenergy, biomaterials, biochemical and next-generation building products
• Renewed in 2014: $90.4M for 4 more years

IFIT objectives:

• Funds up to 50% of total costs of eligible Canadian forest industry innovative, first-in-kind projects
• Non-repayable contributions; up to $20M per recipient
IFIT’s 1st generation results

- The first iteration of the program:
  - generated 107 unique applications
  - $2B in total proposals received, $550M requested from IFIT
  - 14 projects funded across 5 provinces
Canadian leadership examples in forest industry derived bio-products

Cascades Norampac mill in Témiscouata-sur-le-Lac, Quebec
Hot water to extract hemicellulose from hardwood chips

Kruger Biomaterials Inc.'s Cellulosic Filaments Demonstration in Trois-Rivières, QC.

Structurlam Products Ltd. EcoStructure wall system Project In Penticton, BC

West Fraser's Lignin Recovery Plant in Hinton, AB
Canadian leadership examples in forest industry derived bio-products

Alberta-Pacific Forest Industries Inc. Methanol purification project Boyle, AB

BC Passive House Inc. Commercializing of prefabricated panelized passive house systems Pemberton, BC

Lauzon inc. Optimizing forest resources through innovation Papineauville, QC

Millar Western Forest Products Ltd. Bioenergy-Effluent project Whitecourt, AB
Currently in the 3rd IFIT wave of forest industry transformation projects…

- Fall 2014 solicitation attracted 79 projects worth more than $500M request for funding ($1.9B investment)

- New cohort of 2nd generation projects
  NRCan hosted National Forest Innovation Summit in July 2015

% Applications by Subsector

- Bioenergy - 33%
- Solid Wood - 35%
- Biomaterials - 21%
- Biochemical - 11%

Bioenergy
- Advanced biogas, pyrolysis, torrefaction, bio-crude

Solid Wood
- Supply chain optimization, new engineered wood products, energy efficient systems and advanced cross laminated timber

Biomaterials
- Advanced packaging applications, fiber based biocomposites, modified and specialty cellulose derived products

Biochemicals
- Lignin derived bio-polymers and binders, insulating bio-foams, cellulosic sugars
What’s coming next?

• Forest industry building portfolio of 1st generation biorefinery and bioproduct projects
• Broadening of business partnerships & new players
• Expand the range and value of applications for emerging forest industry bioproducts
• Growing forest industry interest in bioeconomy opportunities
1st report on results now available!

http://cfs.nrcan.gc.ca/publications?id=36149

Thank you!

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ANNEX 1 : Selected project details

- Alberta-Pacific: Green Methanol
- Kruger Biomaterials: Cellulose Filaments
- Cascades: Hemicellulose Hot Water Extraction
- West Fraser Mills: Lignin Extraction
Alberta-Pacific Forest Industries
Biomethanol extraction and purification

- Grade AA (bio) methanol extracted from mill pulping residual streams
- First-in-world, Canadian developed technology
- Green chemical is used onsite or sold for specialized use
Kruger Biomaterials
Cellulose Filaments (CF)

- Collaboration between Kruger and FPInnovations
- 5 T/d or 1,800 T/yr production
- Thin & long cellulose filaments obtained through mechanical processing
- High length-to-width ratio, used as a reinforcing agent in various pulp and paper and composite products
Cascades Canada
Hemicellulose Hot Water Extraction

- New hot water pulping enables extraction of hemicellulose from hardwood chips
- Implementation at a commercial scale of American Process Inc’s GreenBox+ technology
West Fraser Timber Co. Ltd
Lignin Recovery

- Commercial-scale 10,000 t/yr kraft lignin recovery process at their plant in Hinton, AB
- Canada’s first commercial-scale plant to recover lignin from black liquor stream
- Based on patented technology developed by FPInnovations and NORAM Engineering.
- Innovative applications include displacement of commercial glues for plywood, MDF, and LVL