

Wood Residual Use in Long-Lived Products to Enhance C Storage

Helsinki, Finland
26 May, 2023

In-Person Participants

Marc Borrega - VTT
Brenda Haskill – MIDNR/MIFBI - Friday
Workshop Leader
Hannu Ilvesniemi - LUKE
Janne Jänis – UEF
Antti Kämäräinen - Montinutra
Karita Kinnunen - Fiberwood
Anuj Kumar - LUKE
Katariina Torvinen – VTT
Xinfeng Xie - MTU

Online Participants

Brian Craig – MIFBI – Project Lead
Julie Manley – Guiding Green/MIFBI – Project
Co-Lead

Duncan Mayes - Lignutech

Planning

Jim Malloy – Weyerhaeuser
David Kronberg – Innovate Marquette
Raju Pokharel – MSU

Process

The Residuals Workshop Team (RWT) began its process with two online meetings in April and May, prior to the Helsinki Workshop. From those initial conversations the Team developed a series of goals for the 26 May session.

Workshop Goals

- Identify needs, aspirations, and capacities of workshop participants while building social capital and trust.
- Learn from each other. What are possibilities? What kind of potential forest product residuals value chains may be discovered?
- Identify promising directions: specific commercial and research applications and opportunities for forest product residuals in products
- Set future actions - Identify and follow through on short- and long-term initiatives/collaborations/partnerships
- Disseminate process and findings



Department of Forestry
MICHIGAN STATE UNIVERSITY



BUSINESS
FINLAND



Michigan
Technological
University



Questions the group worked to answer on 26 May

- What do we hope to gain both long term and short term?
- What are the known possible products and/or the best options for product development?
- How will engagement in the wood residual markets be activated with small companies?
 - Should there be a study of the companies and their challenges and opportunities with a circular economy business model?

Define “Residuals”

- Sawdust, bark, wood chips from sawmills
- Composite cut offs from furniture manufacturing: MDF, particle board.
- Components to understand and measure: characteristics of the tree components such as bark, needles, and branch material, etc.

Technologies

- Extraction methods: chemical, steam, physical, thermochemical
- Recovery of fibers from MDF – remove glues/adhesives – wood fiber insulator.

Plan and evaluate the value chain

There can be multiple C storage options from one residual source.

- High value options:
 - Organic solvents to replace chemical solvents
 - Create a map of high value options
- Long term C storage: furniture, building products, composites
- Intermediate C Storage: chemical building products; platform chemicals
- Short Term C Storage: fuel, cosmetics, food additives

Report-out Slide Content

The work of the group was summarized on a single slide at the conclusion of the workshop.

Residuals Goal: Convert Industrial Biomass to Biochemicals, Biopolymers, and recycle to fibers.

Road map:

- *Industrial/manufacturing biomass*
 - *Composites (MDF, OSB, Particle Board), bark, sawdust, chips*
- *Co-Innovation projects for biomass properties characterization*
- *Map out enabling technologies and connection: circular bioeconomy and the business model*
 - *Collaboration points; compilation of information, current research: who is doing related research, focus, timelines*
 - *Leverage existing research, projects, and technologies*
- *Outreach to industry*

Next Steps and Planned Follow-up items

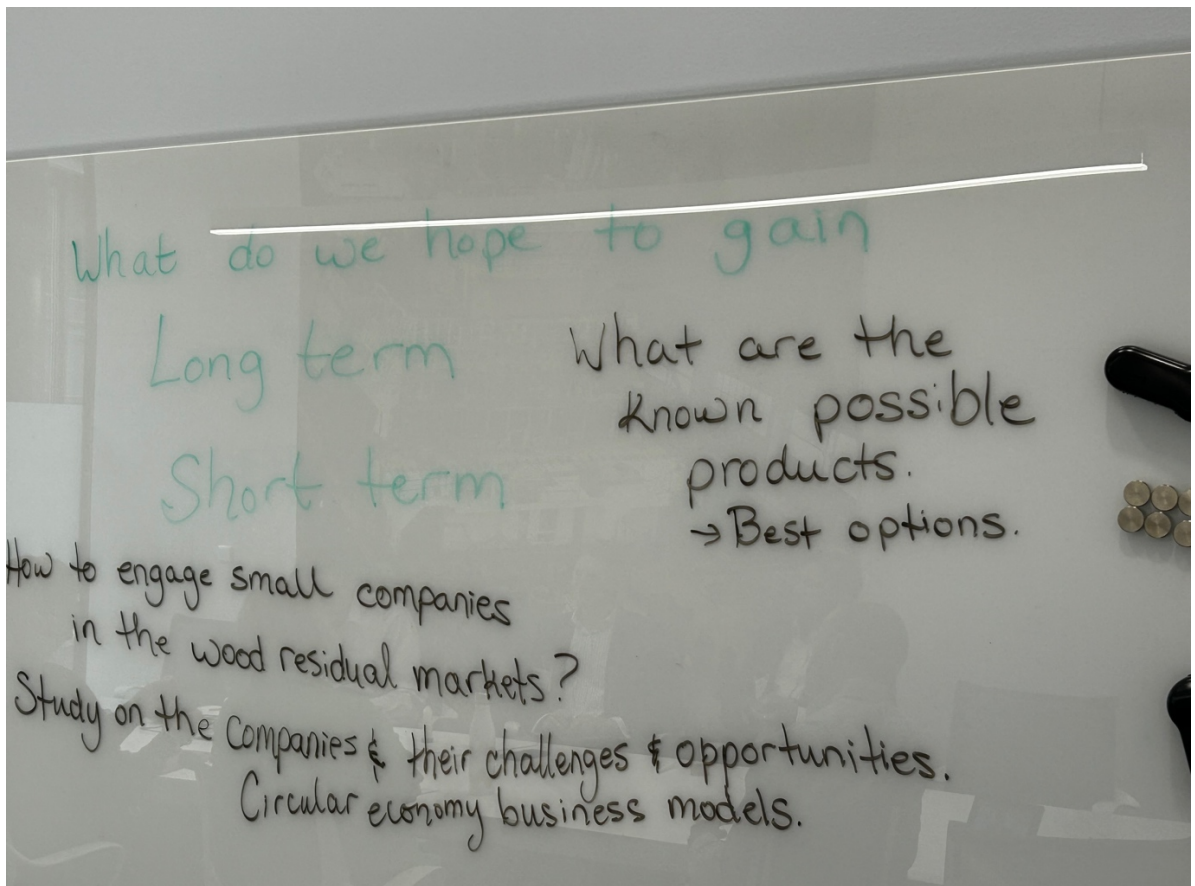
- Organize a virtual meeting to gather and recap this content and then begin to discuss next steps
- Plan and host an in-person workshop in 2024 in the USA to collaborate and continue the work.

Additional Materials

Residuals Workshop Team On-Site Selfie 26 May, 2023



Whiteboard Notes from Workshop



Liquified Biomass

understand
Projects to measure characteristics
of the tree components
branches, needles, bark

Plan &
Evaluate
the
Value
Chain

Sawdust, byproducts of manufacturing

Road map of the current process/technologies/products
& which level they are at.

Franchionisation

How to
in
Study

We don't need every molecule

Social Acceptance

High Value options - organic solvents
to replace chemical
solvents

Consumer Acceptance
of visual differences

Less bleaching

Multi storage
Options
from one
Residual
Source

Create a "map" of the
High value options.

<p>Long term C Storage</p> <p>Furniture Building products Composites</p>	<p>Intermediate C Storage</p> <p>Chemical building blocks (platform chemicals)</p>	<p>Short term C Storage</p> <p>Fuel Cosmetics Food Additives</p>
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What are the materials

Sawdust from Sawmill
Bark, wood chips ↑
composite cut-offs
"furniture" manufacturing
MDF, Particle board

What can be made
- Conversion?

③ chemical
physical
biological

Steps needed

Chemical - extraction
Thermochemical

Steam extraction
Physical Defibrillation

Recovery of fibers
from MDF
remove glues/adhesives

↓
Wood fiber insulation

MDF
OSB
Particle Board
Composites

Industrial / Manufacturing
#1 Biomass

Bark Sawdust Chips

#2 Concrete Steps → Research projects for biomass properties
Co-Innovation characterization

Leverage
existing
research
projects
technologies

#3 → Map out enabling technologies
& connect to

→ Collaboration points
Compilation of information
- where is the research at & timeline
→ circular bioeconomy
& the business model

#4 Outreach to Industry