

From Ontario Fields to High-Value Chemicals and Advanced Materials

Ontario Biomass Producers Co-operative - Annual General Meeting 2026

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Carboform

Why we started Carboform

We saw a need for cleaner chemicals in everyday products and an opportunity to transform abundant, underused biomass into sustainable materials made from domestic resources.



Safer bio-based products



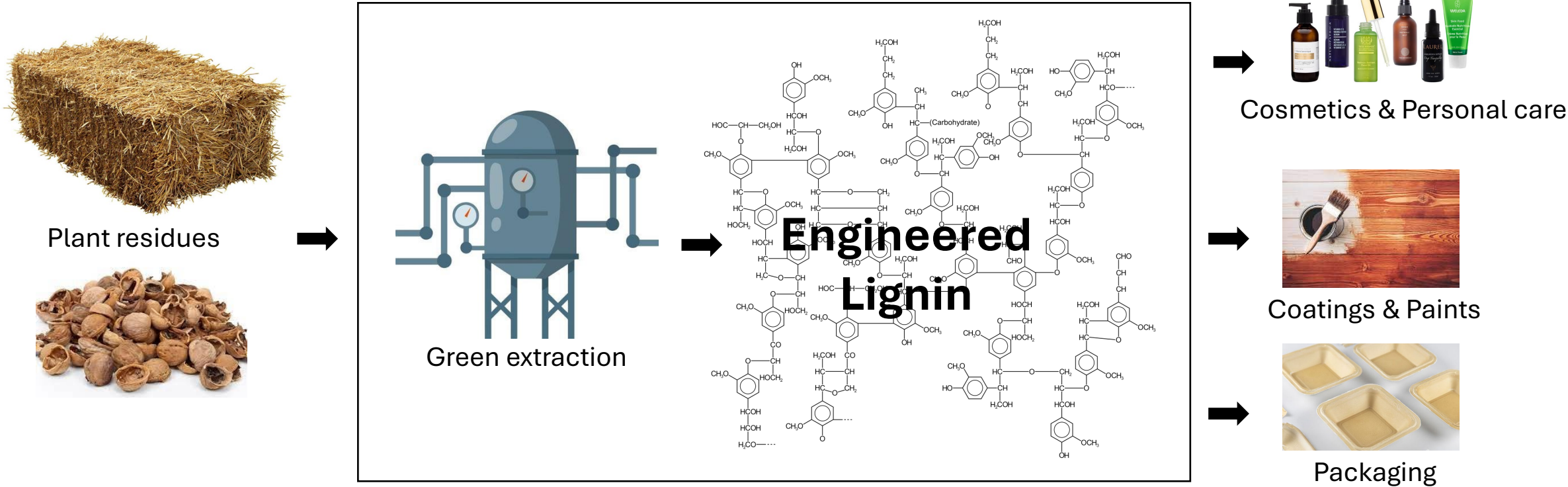
Made in Canada



Cleaner for the environment

Our Solution: Engineered Lignin

One Renewable Building Block, Endless Possibilities



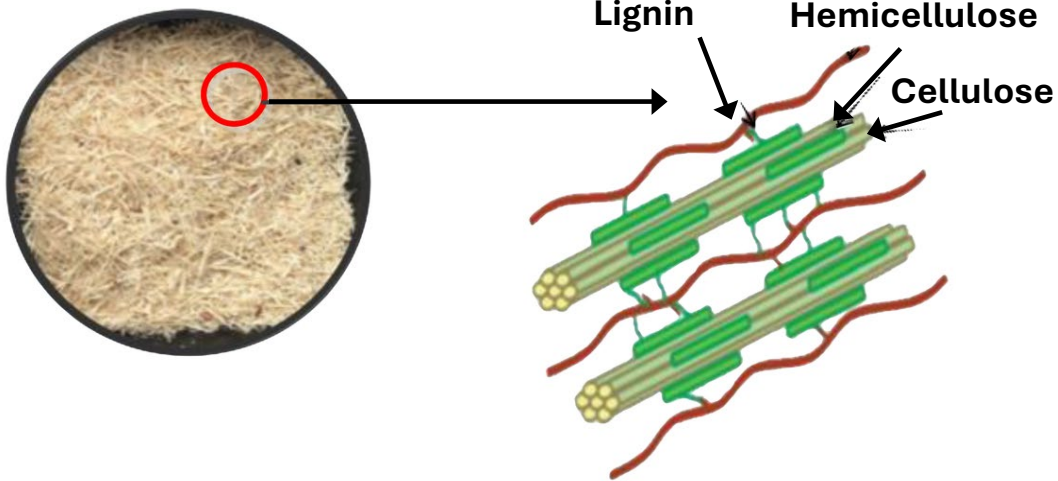
RENEWABLE RESIDUES

GREEN PROCESSING

INTEGRATED SOLUTIONS

Lignin – what it is and why is it underused?

Lignin is the most abundant **aromatic biopolymer** found in **terrestrial plants** and it remains substantially **underutilized industrially**.



How is it currently produced?

Pulp & Paper

Lignin waste but native lignin structure damaged

Cellulosic ethanol

Lignin remains in residue

Biogas digestate

Lignin remains in digestate

Common Uses of Lignin from Pulp & Paper

Solid fuel at pulp mill

Asphalt and concrete additive

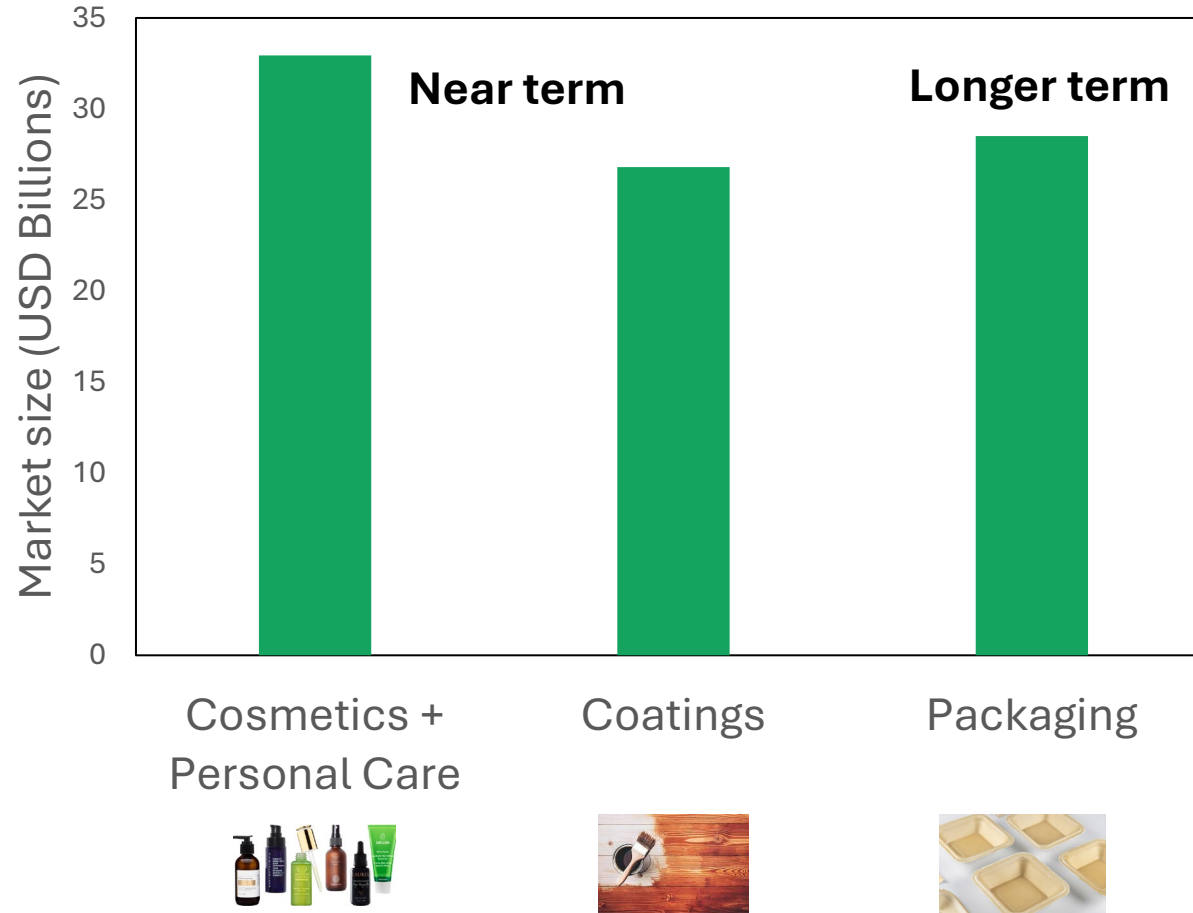
Binder/adhesive additive

Dispersing agent

Where would our engineered lignin go?

Our Lignin offers:

- Sun protection
- Natural preservative
- Antioxidant
- Water repellency
- Film forming capability
- Carrier for active ingredients



How our lignin differs from pulp & paper lignin ?

1. Use mild & green chemistry



Principle 1. Waste prevention

Principle 3. Less Hazardous chemical synthesis

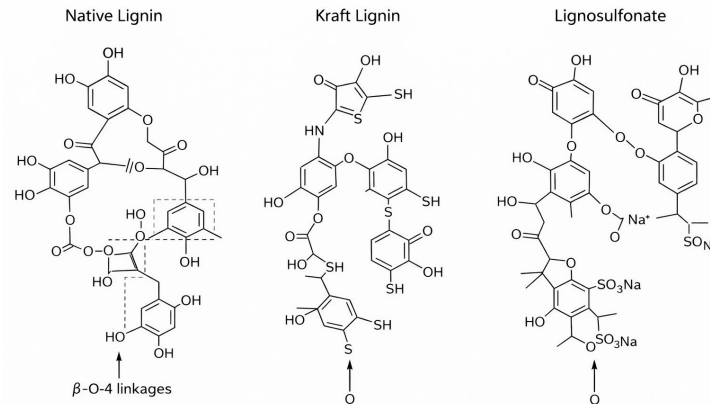
Principle 5. Safer solvents & auxiliaries

Principle 6. Designing for energy efficiency

Principle 7. Use of renewable feedstocks

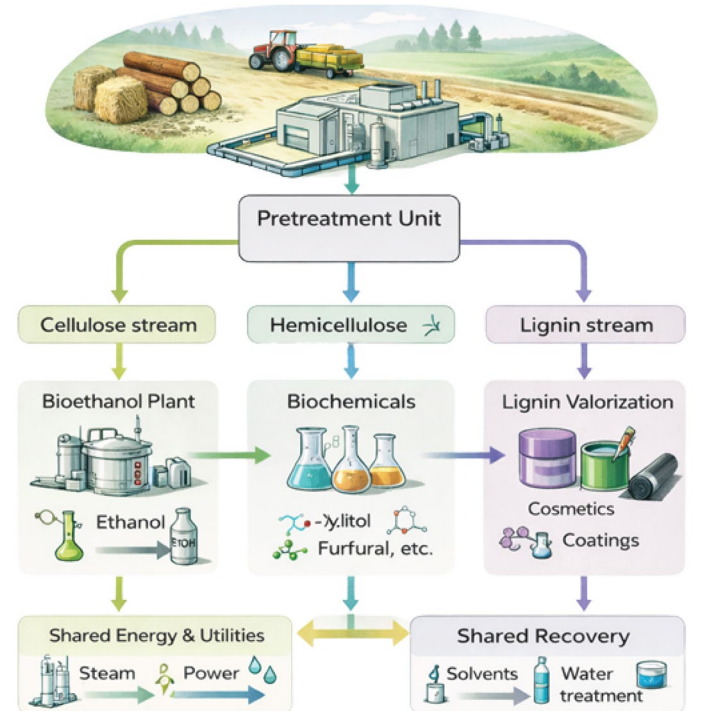
Principle 8. Reduction of derivatives

2. Preserve lignin structure and properties

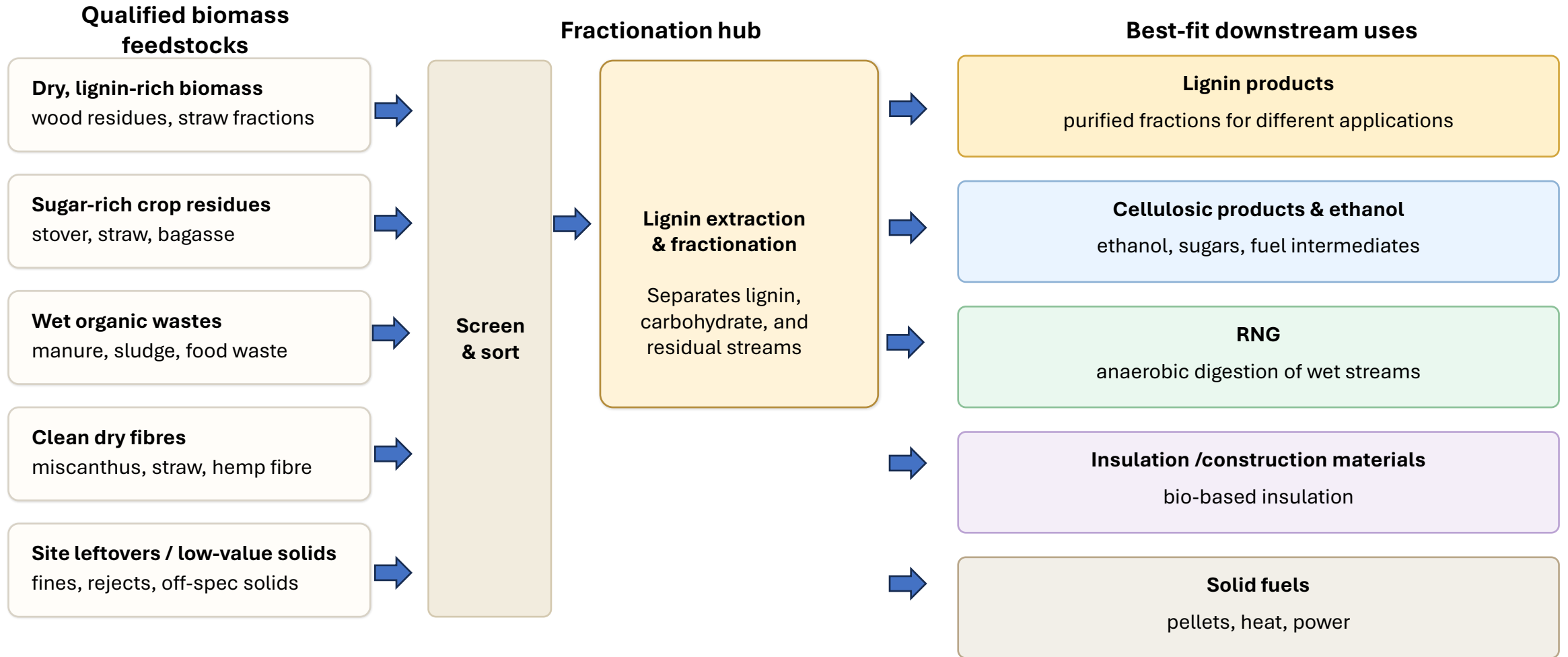


- Priority for P&P is cellulose pulp
- Introduces sulfur groups in lignin structure
- Odour & dark colour
- Purity

3. We can co-locate with other bio-economy operations



How Carboform fits into a bio-refinery campus?



Feedstocks influence lignin quality and quantity



1. Yield

2. Purity

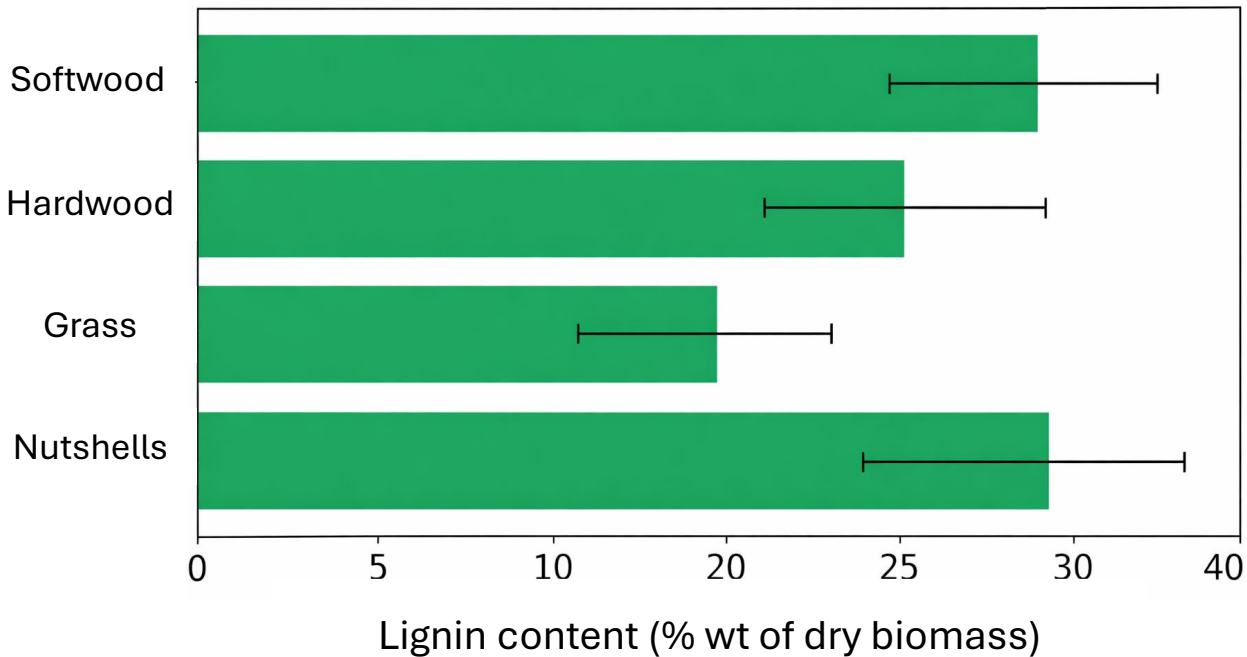
3. Chemical Structure

4. Performance

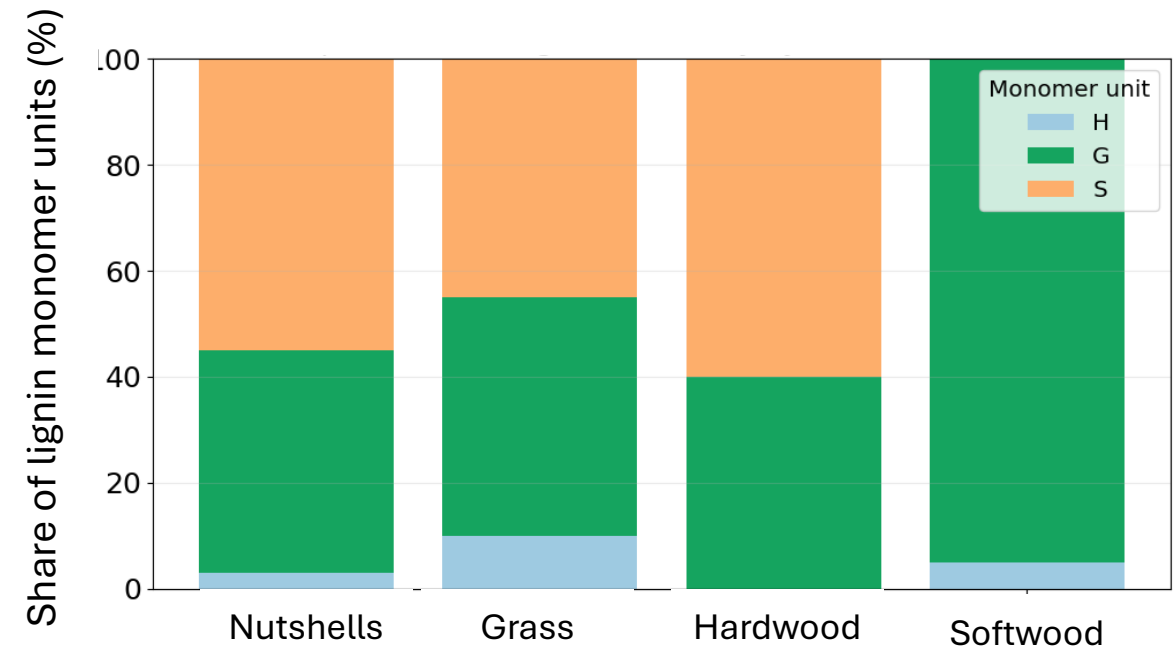
5. Market fit

Lignin in different feedstocks is different

Lignin content



Lignin chemistry



We tested various Ontario feedstocks – agricultural and forestry derived

Grass:
Switchgrass



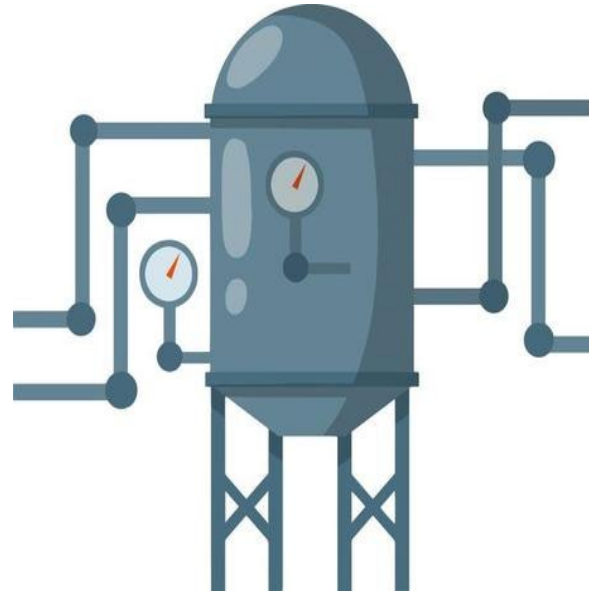
Endocarp:
Walnut
shell



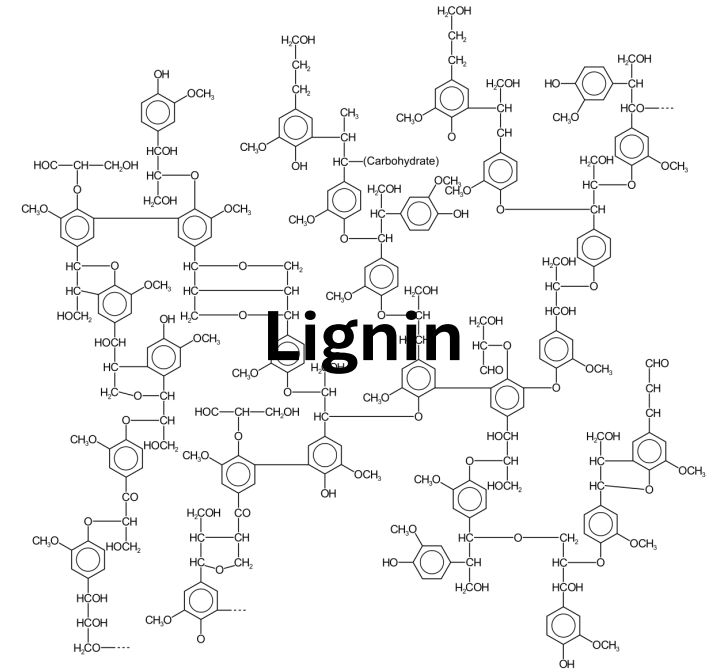
Hardwood



Softwood

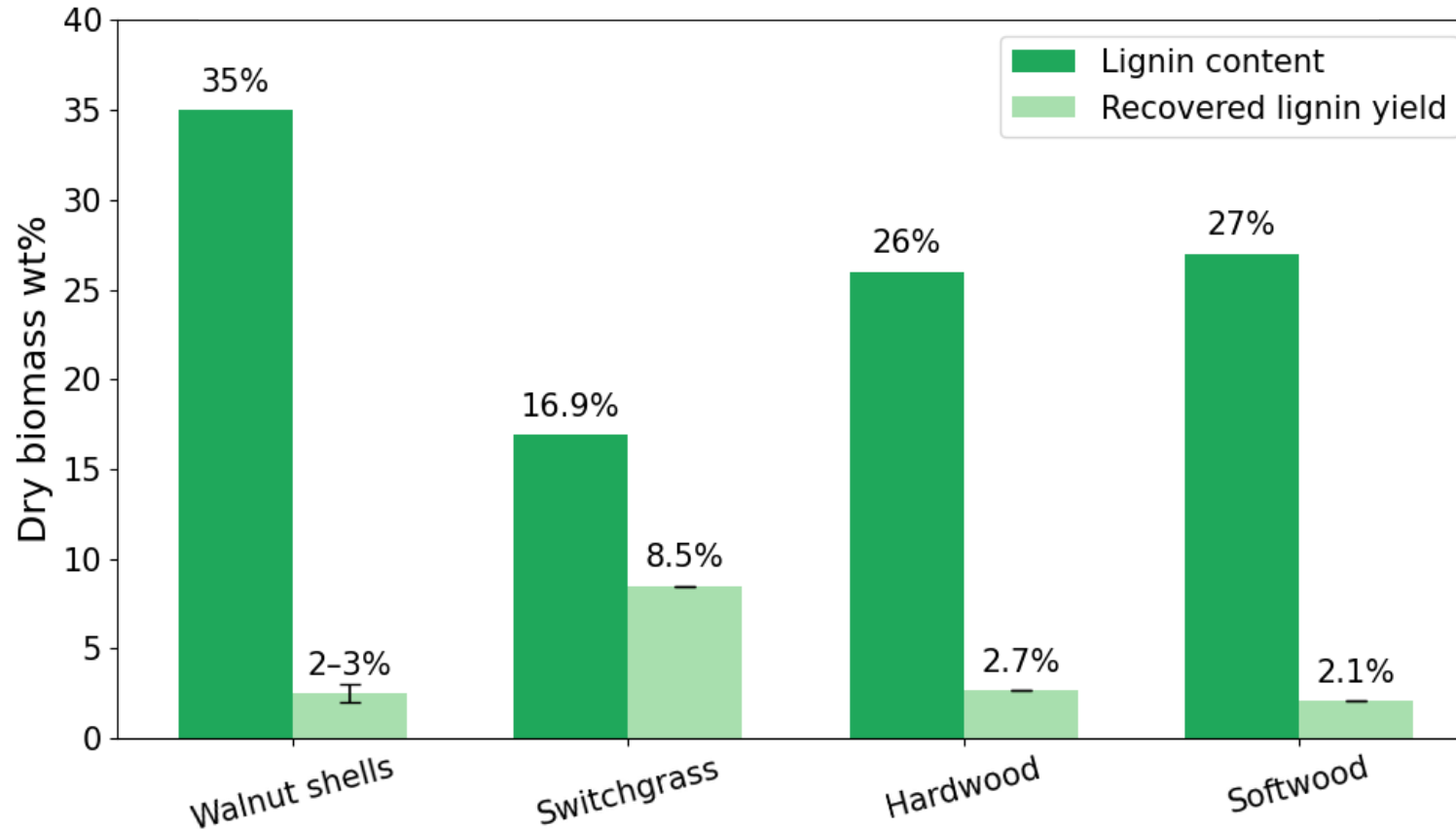


Green extraction



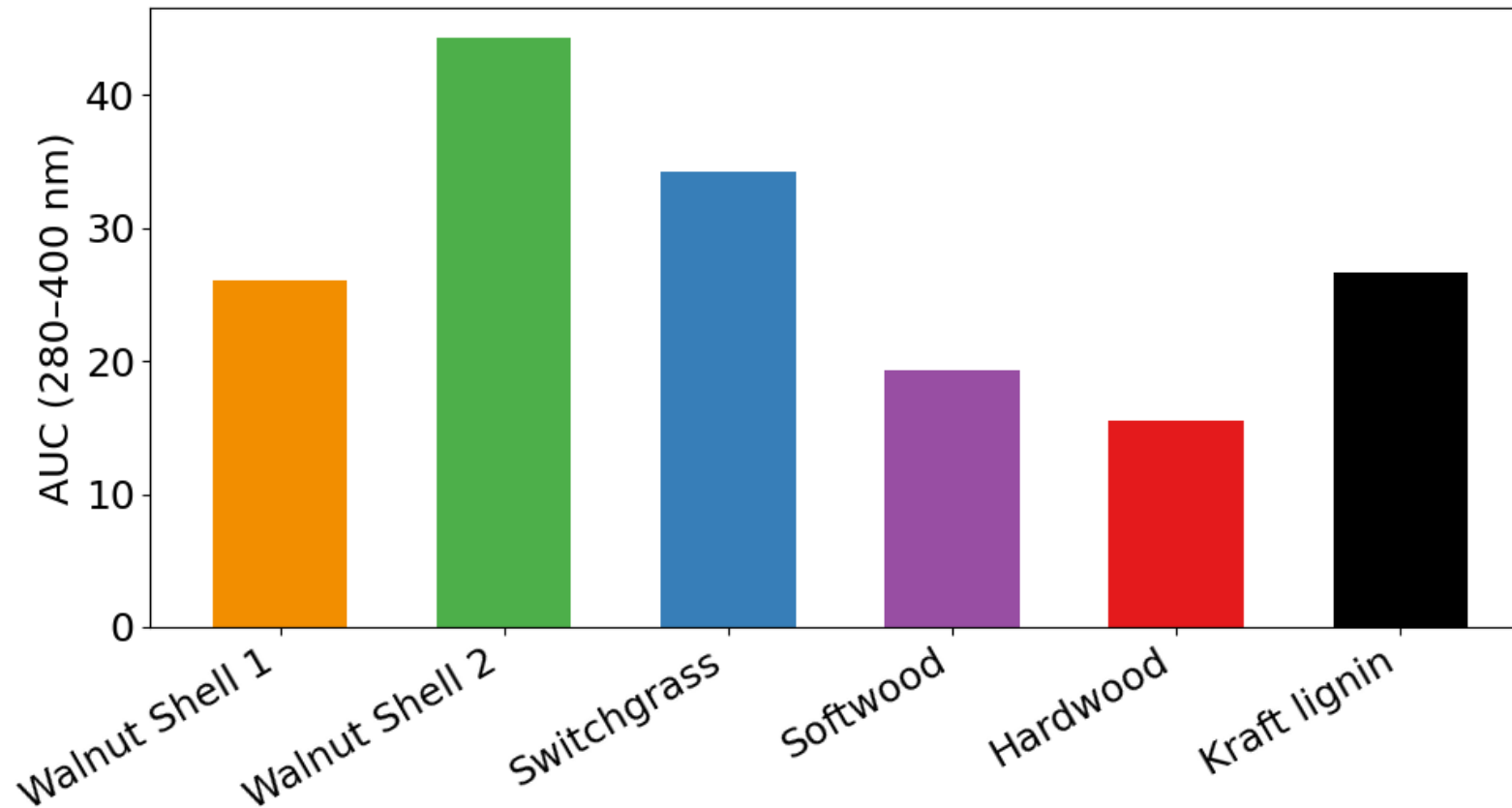
Cosmetic or Polymer additive

Lignin recovery varied across feedstocks



Lignin recovery reflects accessibility more than total lignin content

Several biomass lignin fractions outperform kraft lignin in UV absorbance



UV absorbance → supports coatings / protective formulation potential

Extracted lignin can be produced in a range of colors



Colour → constrains market fit, especially for appearance-sensitive uses

What we've learned so far

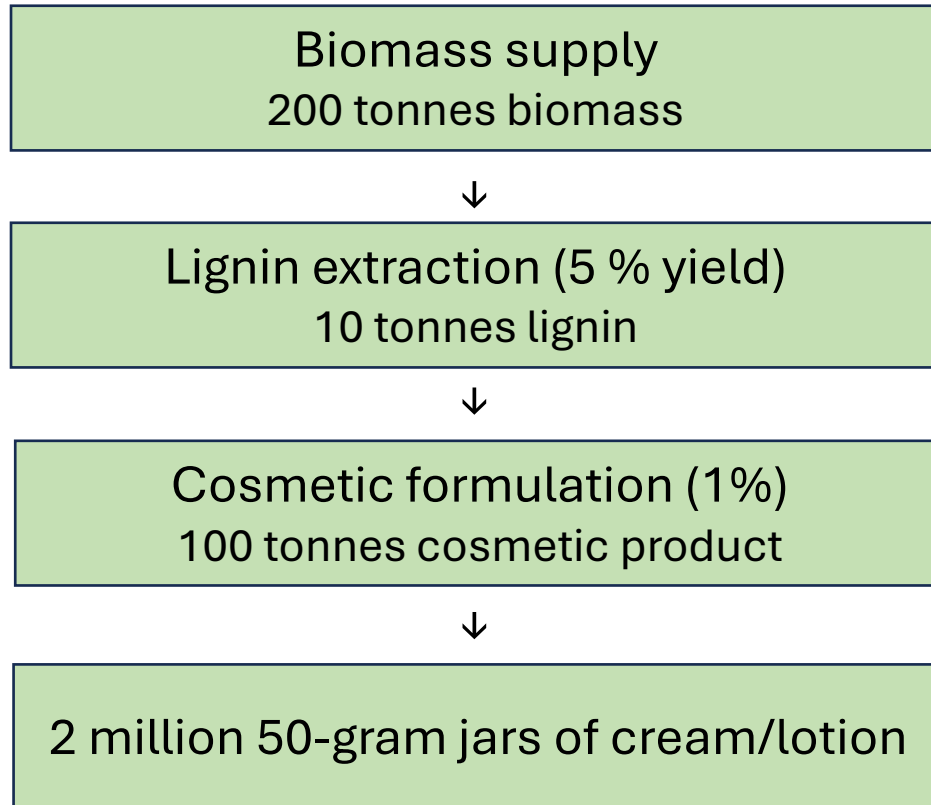
- Mild extraction yields distinct lignin profiles across Ontario feedstocks
- Selected agricultural residues show promising combinations of yield, colour, and functionality

Next milestones:

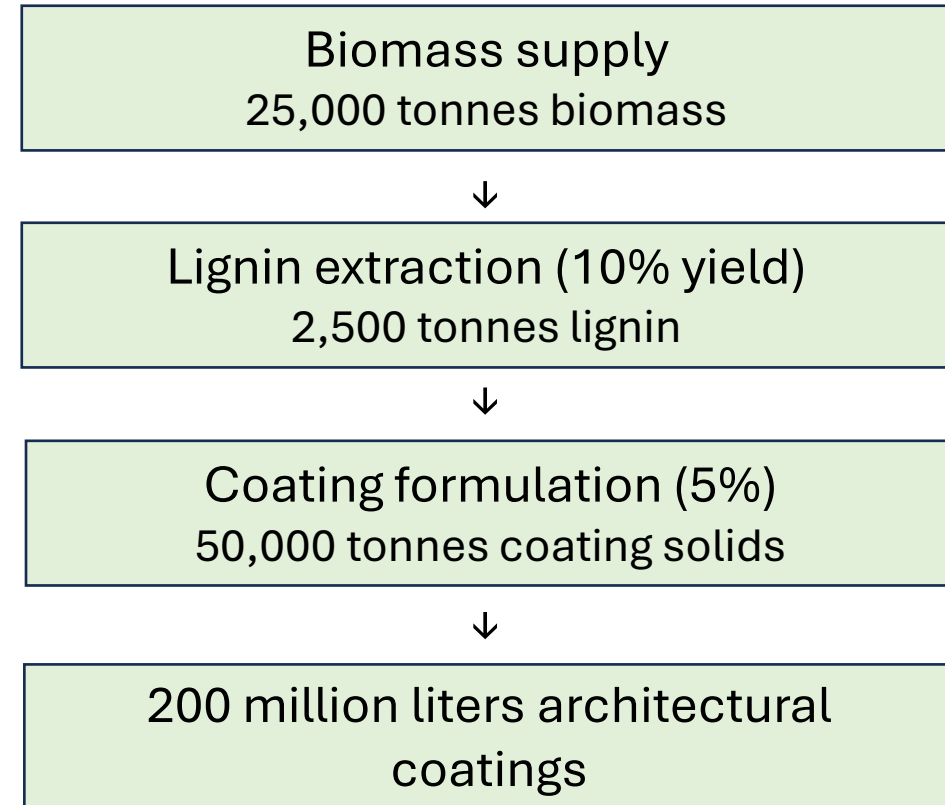
- Detailed Application testing
- Pilot-scale (kilogram) validation with partners

Large product markets can be served with modest biomass volumes

Cosmetics



Coatings



We're seeking partners across the lignin value chain

Biomass producers

Feedstock access, supply partnerships, side-stream valorization

Processors

Extraction, scale-up, tolling, formulation and manufacturing

Researchers & collaborators

Application testing, validation, product development

Interested in feedstock, scale-up, or application development? Let's talk.

Carboform Team & Collaborators



Sneha Shanbhag, Ph D.
CEO & Co-founder



Jumiati Wu, Ph D.
CTO & Co-founder



Jingxuan Tian
Research Associate



Mahmoud Sultan
Research Intern



Collaborators

Cosmetic science & personal care



Go to Market



Feedstock supply relationships





Carboform

Interested? Let's connect!
hello@thecarboform.com

