

# The Canadian Circular Bioeconomy: Opportunities and Challenges

Sustainable Materials Circular Economy Virtual Workshop 2020

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Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Happy 100<sup>th</sup> National Forest Week!

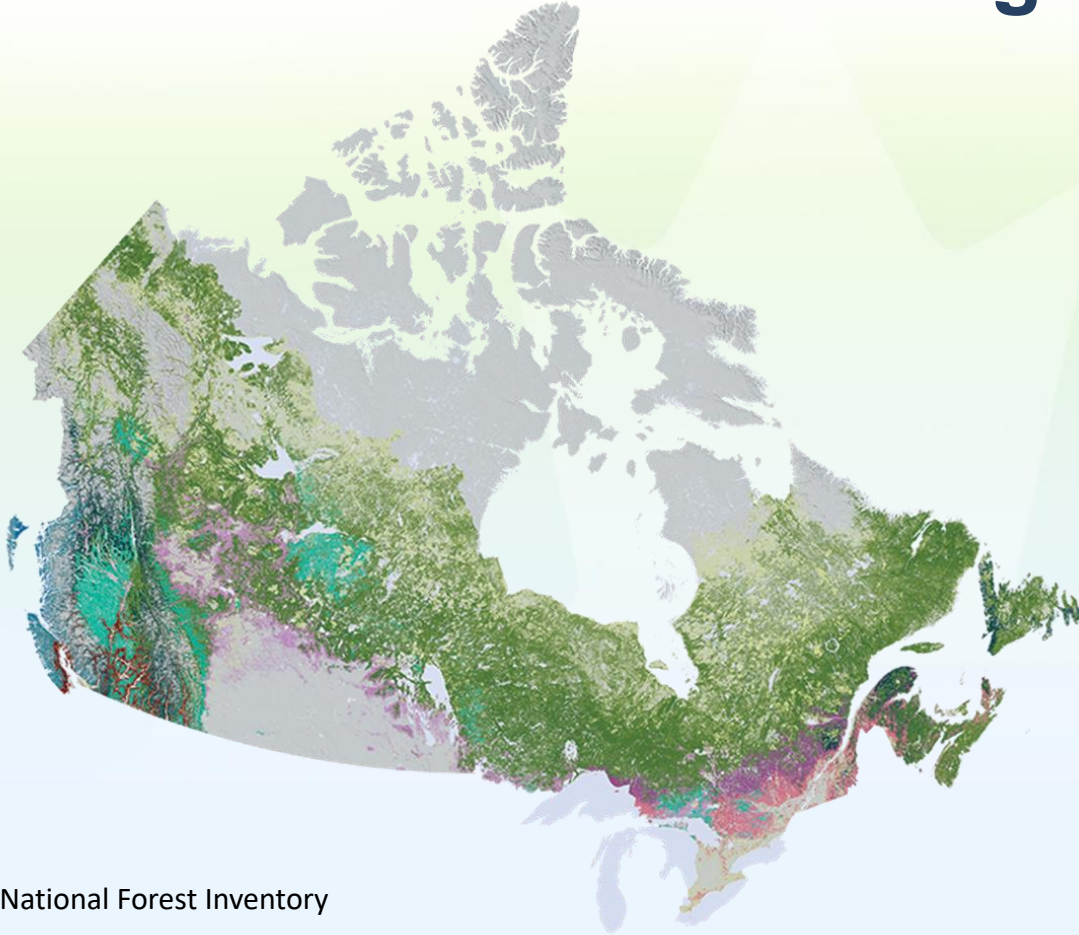
Each year National Forest Week (NFW) is celebrated across Canada by many individuals and diverse governmental and non governmental organizations. During NFW, Canadians are invited to learn more about Canada's forest heritage and to raise awareness about this valuable and renewable resource. Forests are fundamental to our economy, culture, traditions and history – and to our future. Communities, families and individuals depend on forests for their livelihood and way of life.



**National Forest Week**

**Semaine nationale de  
l'arbre et des forêts**

# Canada's forests advantage



- 347M hectares, 9% of the world's forests
- 49% of total forest cover in Canada are certified sustainably managed, which represents 36% of the world's total
- <1% of Canada's forests are harvested each year
- 9% of the world's forest product trade
- 300 communities reliant on forests
- 20Mt CO<sub>2</sub>e removed by managed forests and products

# Sustainable Materials in Federal Policy

A growing number of federal policy initiatives either require or support the use of sustainable materials:

## Climate Goals

- Meeting or exceeding 30% emissions reductions by 2030
- Achieving net-zero carbon by 2050
- Transition to Low Carbon economy

## Plastics and Circular Economy

- Zero Plastic Waste Strategy
- Support for innovation
- Developing Circular Economy goals
- Hosting the World Circular Economy Forum 2021

## Sustainability

- Protect and enhance biodiversity
- Increase Canada's protected areas
- UN SDG's
- Federal Sustainable Development Strategy

## Bioeconomy

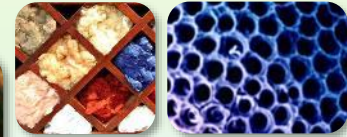
- CCFM Forest Bioeconomy Framework
- Support for innovation
- Nature-based solutions

## Economic Recovery

- Implementing a green economic recovery policy
- Inclusive growth
- Green infrastructure investments
- Support for industry transformation

# Circular Bioproducts: Leading the way for sustainable materials

- Circular bioproducts follow the circular economy principles:
  - Designing out waste, keeping materials in use as long as possible, regenerate nature
  - In circular bioeconomy and biomaterials, biological resources are renewable, sustainably managed, recovered and reused as much as possible.
- Multiplying Bioeconomy Solutions & Cleantech Innovations:
  - Bio-based products ranging food & lumber to high-value chemicals & fuels, engineered wood products, & bio-packaging.
  - Industry 4.0 - Transforming bio-based industries through innovative clean technology adoption.

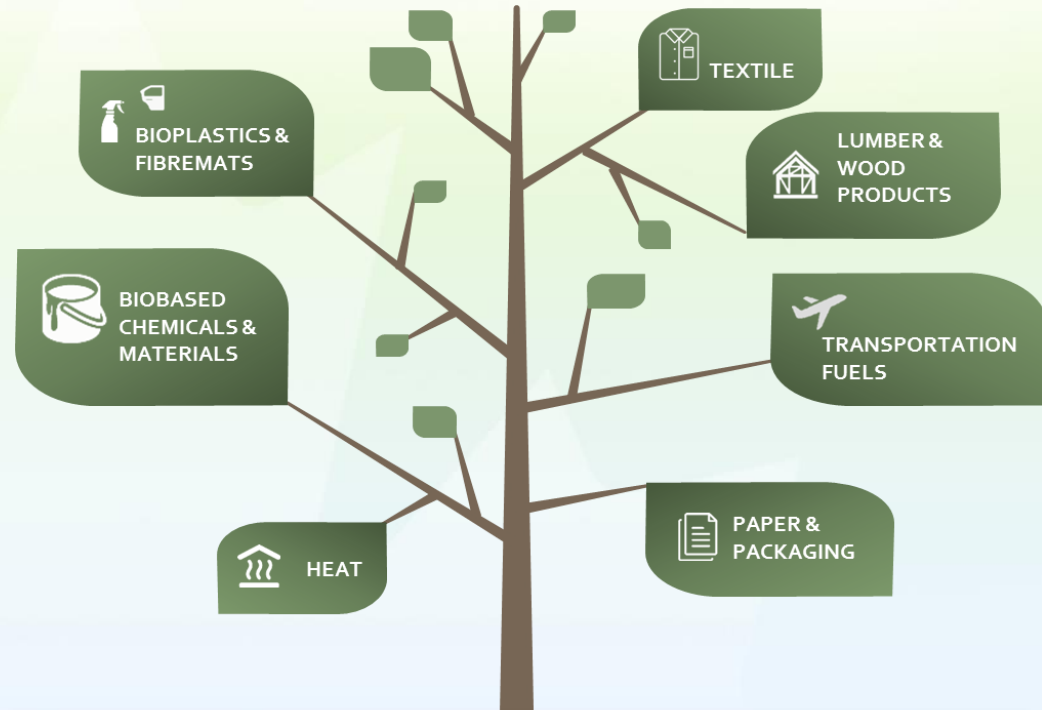


“What makes agriculture and forestry special? The potential to compensate for emissions through carbon sequestration and storage; and mitigation actions can co-deliver economic, environmental & social benefits.”

- Dr Ben Allen, Institute for European Environmental Policy

# Circular biomaterials have many co-benefits

- Reduces GHG emissions and fights climate change
- Accelerates Canada's transition to a clean energy future
- Provides low- or no-waste alternatives for non-renewable resources, including plastics
- Enables resource efficiency and ultimately minimizes land use impacts on biodiversity
- Provides regional development opportunities and jobs
- Increases competitiveness and value-added for biomass products

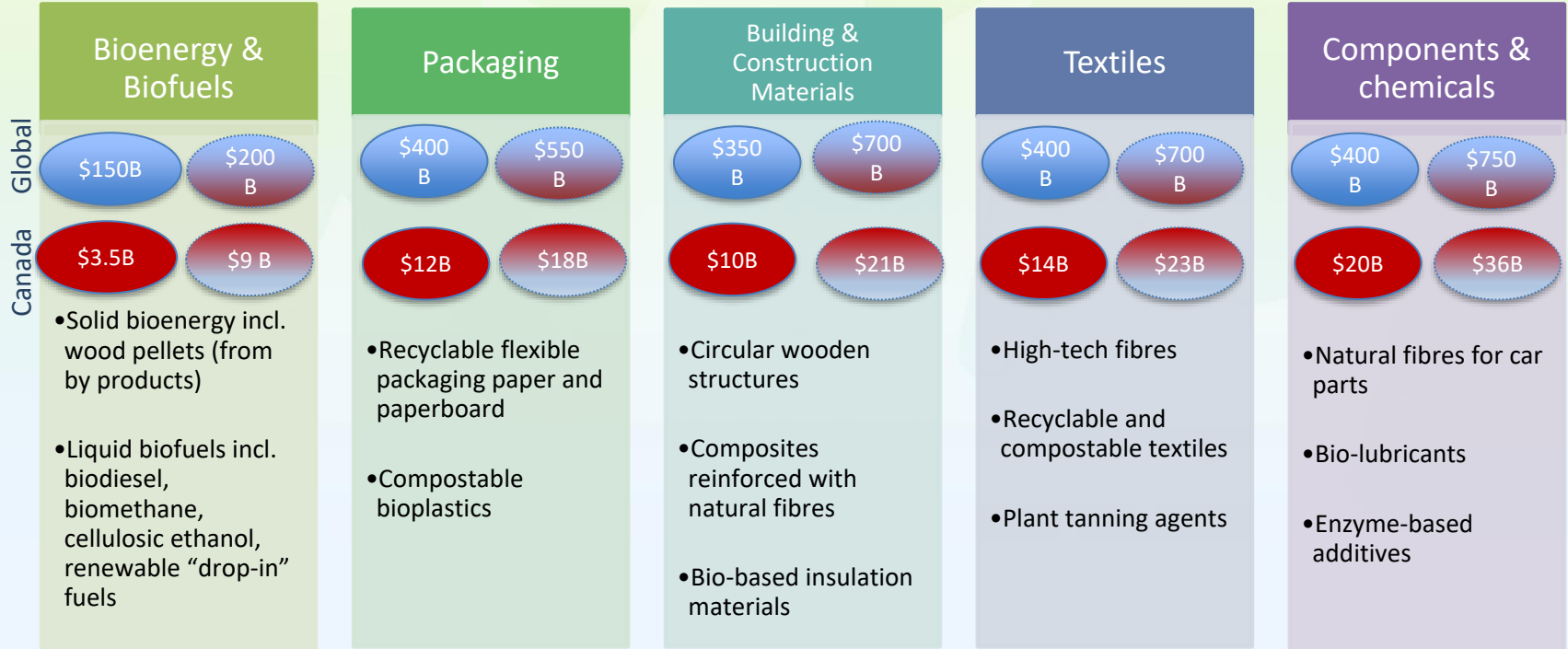


In our view, a sustainable, circular bioeconomy is an integral part of the circular economy when bio-resources and feedstocks are maintained and supplied sustainably.

# Circular Bioeconomy: a growing opportunity

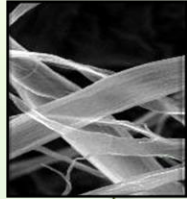
- A US\$7.7 trillion global opportunity for business by 2030, spread across industries
- Canada's share estimated at between C\$150-240 billion in 2030

MARKET SIZE (in USD \$BILLION)



(Source: [CEO Guide to the Circular Bioeconomy](#), World Business Council for Sustainable Development, Boston Consulting Group)

# Supporting the circular biomaterials - current R&D support and policy initiatives <sup>8</sup>



## Standardization of new biomaterials, CSA/SCC/ISO

- Cellulose materials
- Lignin



## Pilot to Commercialization

- TMP-Bio and LignoForce technologies (CRIBE-Resolute-FPIInnovations)



## Canadian National Standards for Biomass Supply Chain Risk/Finance

- Financial investment de-risking tool
- Canadian Transition Finance Taxonomy



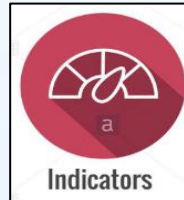
## National Resources Canada/Innovation Solutions Canada

- Biodegradable plastics and biofoam challenges



## International Bioeconomy Forum

- Policy and research alignment to address horizontal challenges



## Bioeconomy Indicators

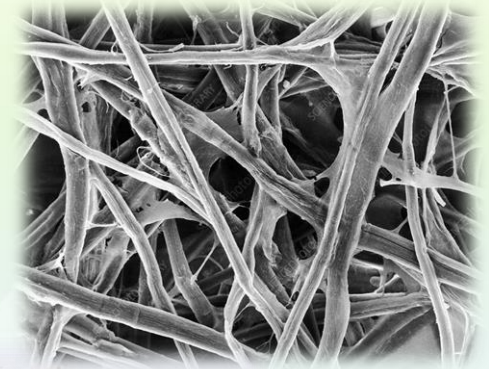
- OECD Circular Economy Indicators
- Bioeconomy Indicators (e.g. national, international, etc.)



# Highlight: Circular Bioeconomy Innovation

- Compostable Personal Protective Equipment (PPE)
  - CFS has engaged with forest sector industry stakeholders to support the rapid conversion of their facilities to address urgent production needs of COVID-19 related PPE products based on forest fibre.
  - We are working with Pulp Moulded Products & Kruger to make non-N95 qualified protective facemasks based on moulded pulp products as a filtering material.
  - Our support will accelerate piloting of this production and the required product certification processes. At full scale, production capacity could reach up to 1 million masks/week.

SEM image of cellulose fibers



# Challenges for the Circular Bioeconomy

- Communicating the opportunity and benefits of the circular bioeconomy
  - Benefits of biogenetic carbon are not well understood
  - Canadian are unfamiliar with the sector
- Meeting growing demands for biomass
  - Biofuels, renewable carbon, biomaterials may all compete for limited biomass
- Commercializing new technology and investing in recycling infrastructure
  - Investment gaps exist in the sector
  - Current infrastructure is inadequate
- Implementing consistent waste related regulations across Canada
  - Inconsistent regulations undermine the development of circular economy



# Next Steps

- Continue to support innovation through federal programming
- Continue to work with stakeholders to implement Canada's Forest Bioeconomy Framework
- Work with industry stakeholders to accelerate commercialization and market acceptance
  - **Upcoming event:** *THE REVERSE PITCH - Closing the Loop on Circular Bioeconomy Innovation* (Virtual workshop) , December 3, 2020 hosted by Foresight CAC.
- Support federal efforts to develop and update standards and regulations related to circular supply chains and the bioeconomy
- Continue to work on coordination and communications with provinces and territories, industry, and academia.

The four pillars of the Canadian Council Forest Ministers Forest Bioeconomy Framework guide our next steps



Communities



Supply



Demand



Innovation



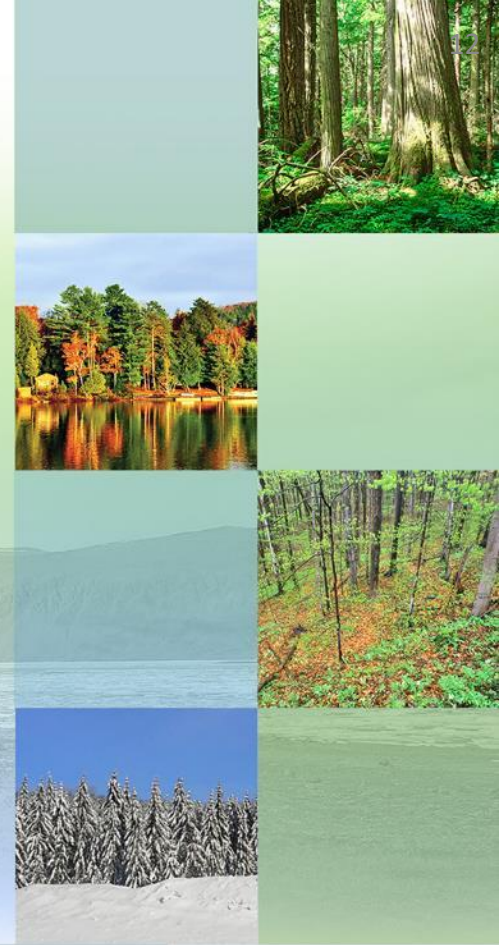
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# Thank you! Merci!

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