

# The Canadian Circular Bioeconomy: *Opportunities & Challenges involving Mass Timber Construction*



Greg Rampley &  
Mohammad Mohammad  
Natural Resources Canada,  
Canadian Forest Service  
October 14, 2020

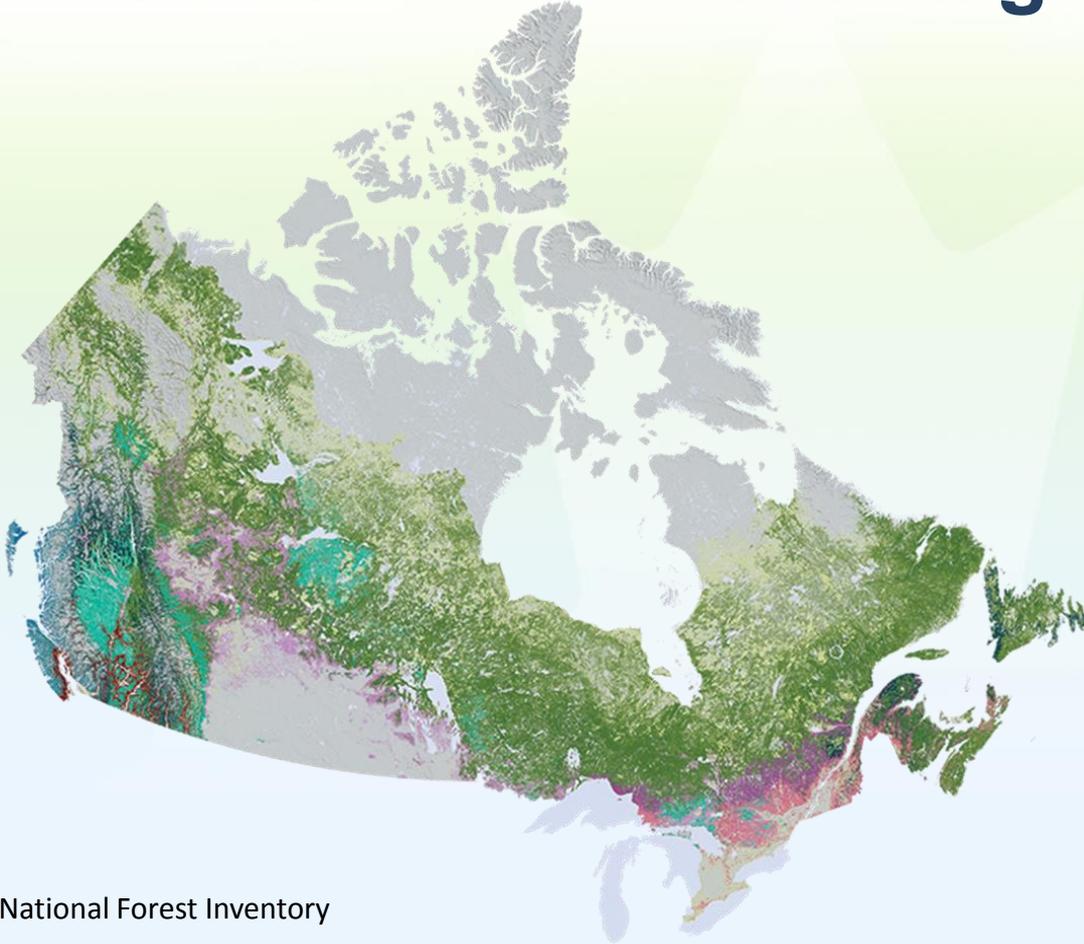


Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# 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 Forest Management in Canada

## Canada is a leader in Sustainable Forest Management

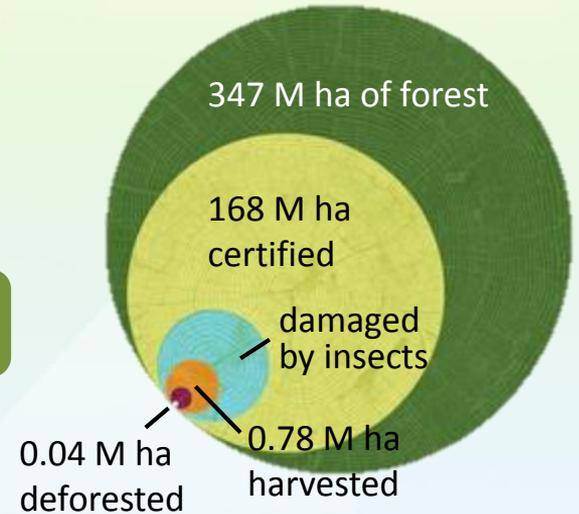
- Extensive framework of laws, regulations and policies.
- Rigorous forest management planning process.
- Science-based approach to decision-making, assessment and planning.
- Progress tracked through comprehensive criteria and indicators.

## Timber is largely harvested on Crown land

- Annual maximum sustainable level of harvest allowed on Crown land set by Provinces and Territories.
- Harvesting is not deforestation: harvested forests grow back through natural or artificial regeneration.

## Canada seeks to build on its reputation for sustainability

- The forest sector communicates its practices and educates consumers on the benefits of sustainably sourced materials



Source: The State of Canada's Forests Annual Report 2018

# Canada Forest Bioeconomy Policy

A Forest Bioeconomy Framework for Canada



***“Canada will be a global leader in the use of forest biomass for advanced bioproducts and innovative solutions”***

*CCFM Forest Bioeconomy Framework for Canada (2017)*



Communities



Supply



Demand



Innovation

# The Circular Bioeconomy in Federal Policy

A growing number of federal policy initiatives either require the circular bioeconomy or support it indirectly:

## 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

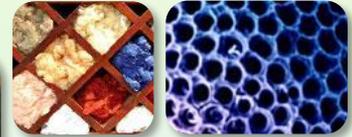
- CCFM Forest Bioeconomy Framework
- Support for innovation
- Nature-based solutions
- Planting 2B Trees

## Economic Recovery

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

# Circular Bioproducts: Leading the way to sustainable future

- 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.
- Circular bioproducts have many co-benefits:
  - Reduce GHG emissions
  - Enable resource efficiency, minimize land use impacts on biodiversity
  - Provide regional development opportunities & jobs
  - Increase competitiveness and value-added biomass products



“Circular Bioeconomy: A US\$7.7 trillion global opportunity for business by 2030”  
- World Business Council for Sustainable Development & Boston Consulting (2019)

# Timber Construction: Trends and Opportunities

- Growing interest in sustainability/green buildings
- Increased use of EWPs including mass timber
- Building codes evolving and permit more wood use
- Increased interest in larger and taller wood buildings using mass timber or hybrid wood and concrete or steel
- More prefabrication....panelized or modular construction



# Driving Innovation in Timber Construction

## Tall Wood Building Demo Initiative (2013-2017)

- Supported two tall wood buildings demonstration projects
- Focused on RD&D to required for design, approval, and construction



Brock Commons, Vancouver  
18 storeys hybrid CLT/glulam



Nordic's Origine, Quebec City  
13 storeys CLT/glulam

# Green Construction Through Wood

- New four year program launched in 2018 in support of Canada's Climate Change Plan: *Green Construction Through Wood (GCWood)*
- Program has three key funding components that aim to support the increased use of wood as a sustainable and climate-friendly construction material in infrastructure projects:
  - Wood and hybrid demonstration projects
  - Building code revisions & research including performance-based codes
  - Technology transfer, design tools, and education



# Supporting Tall Wood Buildings Adoption

## Canadian Building Codes



- 2020 edition of NBCC is expected to allow up to 12 storeys of Encapsulated Mass Timber Construction (EMTC)
- Proposed changes will permit some exposed timber (*up to 35% depending on assembly-type & fire spread rating*)
- Funding extensive R&D activities on fire performance & guidelines for evaluating seismic systems
- Extensive efforts to introduce performance-based codes by 2025/2030

## Education & Tech Transfer

- University and colleges curriculums at engineering & architectural schools
- Design and costing tools including BIM to support architects, engineers, and builders
- LCA data and tools to demonstrate the environmental benefits of using wood in construction
- Continuing education and training of professionals



# Lessons Learned

- Building codes are major impediments to increasing use of wood in construction.
- Need to engage and educate key stakeholders (construction industry, building officials, insurance industry, etc) on the benefits of building with wood
- Support is needed for timber construction education & design tools in order to develop future industry design and construction capacity
- Continue to promote LCA and the environmental benefits of wood buildings among policy makers and other key stakeholders



# Next Steps

- Continue to support innovation through federal programming
- Engage with stakeholders to implement Canada's Forest Bioeconomy Framework
  - This includes working with industry stakeholders to accelerate commercialization and market acceptance on new products, and
  - Support efforts to develop and update standards and regulations
- Emphasize coordination and communications across government, industry, and academia.





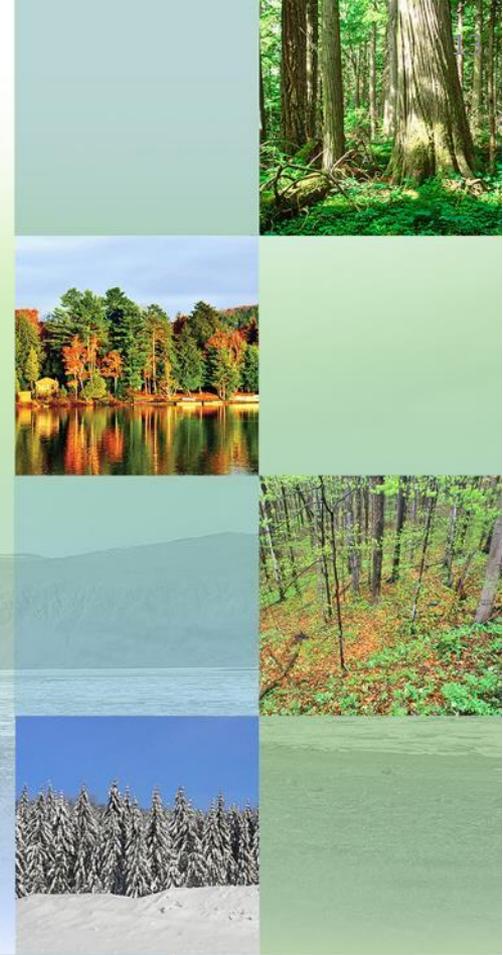
Natural Resources  
Canada

Ressources naturelles  
Canada

# Thank you! Merci!

Canadian Forest Service  
Natural Resources Canada

Greg Rampley  
[Greg.Rampley@canada.ca](mailto:Greg.Rampley@canada.ca)



Canada