

Natural Resources Ressources naturelles Canada Canada

Bio-hubs: Roles in Biomass Supply Chains

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Bio-hubs: Role in Bioenergy and the Broader Bioeconomy

A bio-hub acts as an **intermediary** in biomass supply chains and markets.

Benefits	 Functions as a storage, loading, recycling, and processing facility. Improves biomass supply chains, enhances the value of biomass products, and creates business opportunities.
Challenges	 Variability in biomass availability (weather conditions, seasonality). Requires efficient logistics and transportation management. Capital investment, operation costs and technical complexity.
Opportunities	 Integrate within the bioeconomy through strategic planning and collaboration with various stakeholders. Capitalize on the growing demand for diverse feedstocks from biobased industries

Bio-hub Business Model and Business Model Canvas (BMC)

Bio-hub Business Model:

A framework defining how a business creates, delivers, and captures value for sustainable revenue.

- Essential for **optimizing processes** within bio-hubs, bioenergy production, and the broader bioeconomy.
- The theoretical bio-hub business model surfaced from two workshops: Europe, 2019 and Canada, 2020.

Business Model Canvas:

A visual framework for developing, describing, and analyzing a business model.

- A guide for outlining essential components within the business model.
- **Components**: Key partners, activities, resources, propositions, customer relationships, customer segments, channels, cost structure, and revenue streams.

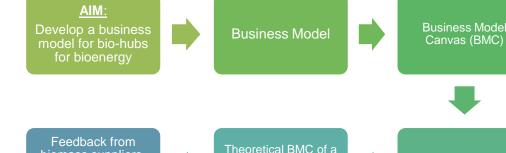
Components of Business Model Canvas

Value Proposition (VP)	Key Partners (KP)	Key Activities (KA)	Key Resources (KR)	Customer Relationships (CR)	Customer Segments (CS)	Channels (CH)
 Feedstock supply contracts Economies of scale Biomass use consultation 	 Biomass suppliers Renewable industry leader Innovation partners 	 Biomass supply Cascading biomass use Biomass service Sustainability certification 	 Biomass processing equipment Transportation infrastructure Skilled personnel 	 Industry Forest owners Local communities Direct contacts Circular economy 	 GHG emission reduction industries Biomass residues holding industries Energy companies such as for district heating Carbon footprint reducing communities 	 Informative websites B2B Initiatives Residue- based bio- industry Public procurement
	COSTS			REVENUE STREAM		ass for energy

Workshop: Business Model for Bio-hubs in Canada

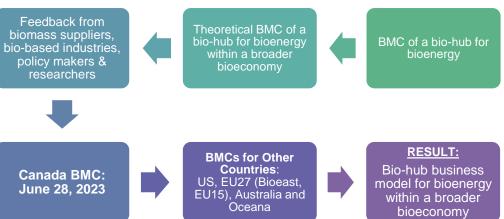
Event Details

- Date: June 28, 2023
- Participants: 27 pre-selected experts

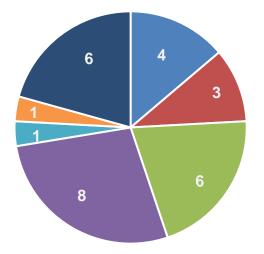


Objectives

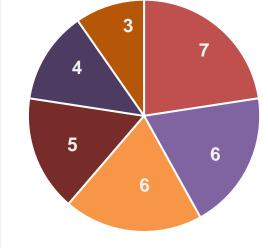
- Present a theoretical bio-hub business model using the BMC template to enhance and tailor the model for Canada.
- **Delve into specific model components** to improve the model.
- Establishing a platform for sharing information related to the engagement requirements for bio-hubs to enhance the "theoretical" business model.



Pre-workshop Survey



- Nova Scotia
- New Brunswick
- Quebec
- Ontario
- Saskatchewan
- Alberta
- British Columbia

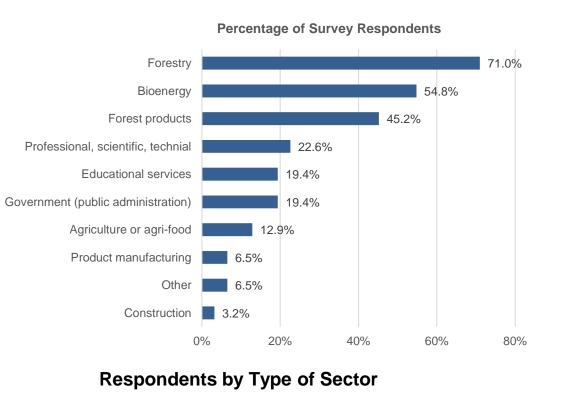


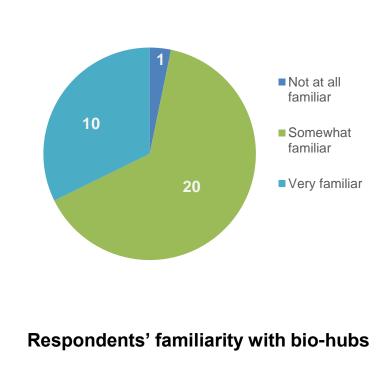
- Not-for-profit organization
- Academia/ University
- Provincial/ territorial government
- Federal government
- Industry or business
- Research Institute

Respondents by type of organization

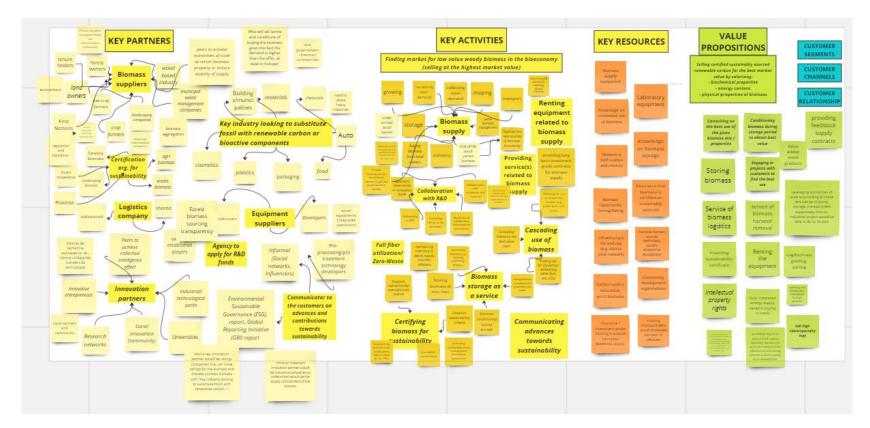
Regional distribution of workshop participants

Pre-workshop Survey





Presentation of Theoretical BMC Utilizing Miro

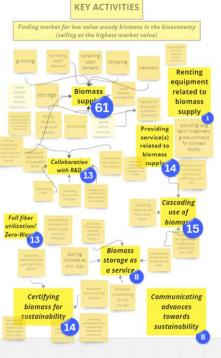


Voting Feature of Miro

Key Partners



Key Activities



Biomass

supply

equipment

Biomass

education

insurance /

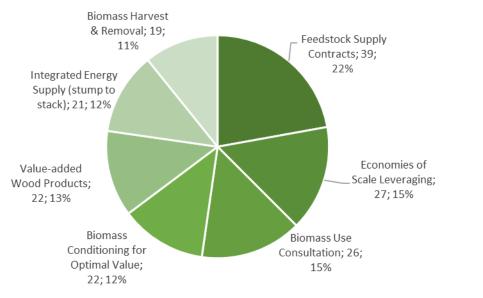
bankable

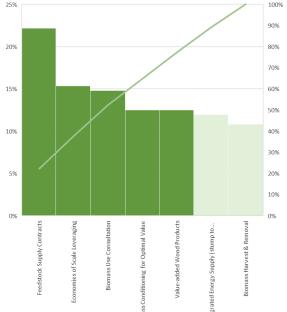


Key Resources Value Proposition



Value Proposition for Bio-hubs





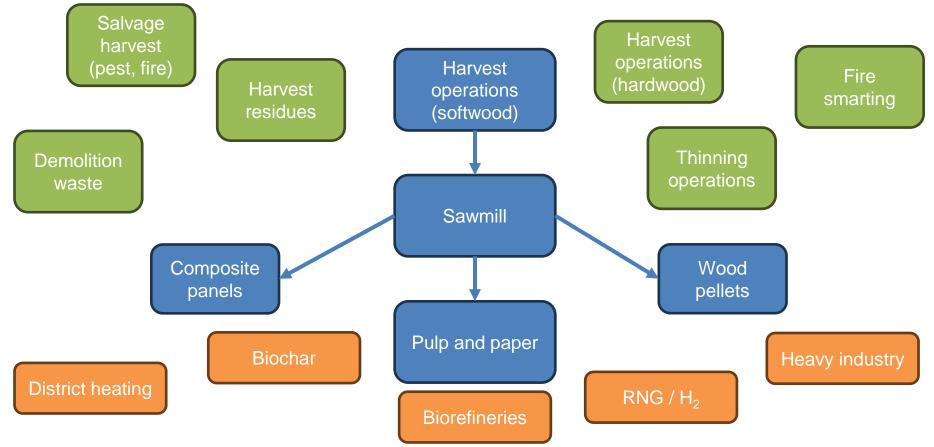
Integration of Key Components of BMC

 Key Partners 1. Biomass Suppliers: 61 2. Renewable Industry Leader: 25 3. Innovation Partners: 22 4. Sustainability certification organisation: 13 5. Logistic partner: 12 6. Equipment suppliers: 10 	Key Activities 1. Biomass supply: 61 2. Cascading Biomass Use: 15 3. Biomass Service Providers: 14 4. Sustainability Certification: 14 5. Full fiber utilisation: 13 6. R&D Collaboration:13 7. Biomass storage services: 8 Key Resources 1. Innovative use of Biomass: 46 2. Assessing Available Biomass: 28 3. Biomass storage Expertise: 20 5. Biomass Transport & Delivery: 19 6. Sustainable Biomass Certification Assurance: 16 7. Insurance & Investment Support for Feedstock Supply: 14	 Value Propo 1. Feedstock Contracts: 2. Economie: Leveraging 3. Biomass U Consultati 4. Biomass C Optimal V 5. Value-add Products: 	Supply 39 s of Scale g: 27 Jse on: 26 conditioning for alue: 22 led Wood	 Customer Relations Industry Network Collaboration: 29 Forest Owners: 23 Local communities: 22 Direct contacts: 18 Circular Economy & Sustainability Recognition: 16 Support for Consumer's Fuel Switching Infrastructure Financing: 15 Channels Net-Zero Industries Events: 31 Residue-based Bio-industry: 31 Public Procurement: 23 B2B Initiatives: 22 Lobbying Efforts: 13 Biomass supply & Bioeconomy conferences: 9 BDO Zones: 9 Social innovation & Entrepreneur Sponsorship:2 	 Customer Segments GHG Emission Reduction Industries (Carbon Pricing): 38 De-Fossilization - Required Industries: 28 Biomass Residue- Holding Industries: 25 Energy Companies e.g district heating: 20 Carbon Footprint- Reducing Communities: 19 Wood Pellet Industry: 10 Regional Developers: 6 		
Costs				Benefits: revenues, perks, fringe benefits			



- Successful biomass supply in the bioeconomy requires strategic partnerships, optimized operations, resource access, strong customer relationships, and effective outreach channels.
- Despite the opportunities, various challenges exist in implementing elements of the bio-hub business model.
- Tailored to Canada's unique bioenergy challenges and opportunities, this workshop provided insights for a successful bio-hubs business model.
- Limited bio-hub examples in Canada mean that best practices and key success factors remain to be defined.
- Integration of bio-hubs within supply chains will evolve as we learn how they can best support business opportunities.

Bio-hubs, Why Now?



Study Limitations

- The workshop focused on forest supply chains, suggesting a need to **include other bio-based sectors**.
- Participation was limited considering that conditions vary greatly across regions in Canada, namely calling for more Indigenous involvement.
- The results are **exploratory**, providing insights into the perceptions of sector representatives rather than presenting a fully validated business model.

Future Steps in Business Model Development

- Obtain cost and revenue data through case studies to inform subsequent models.
- **Connect with more stakeholders** designing and operating bio-hubs in Canada to validate the model and demonstrate bio-hub implementation.
- Future studies should investigate how investments in biomass supply chain management and policies can facilitate bio-hub development.
- **Replicate the workshop** in other countries, offering lessons on crucial factors for business models and fostering innovative thinking.



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Questions



