

# Circular Construction Innovation Hub



A Solution Space by  
**Generate Canada**



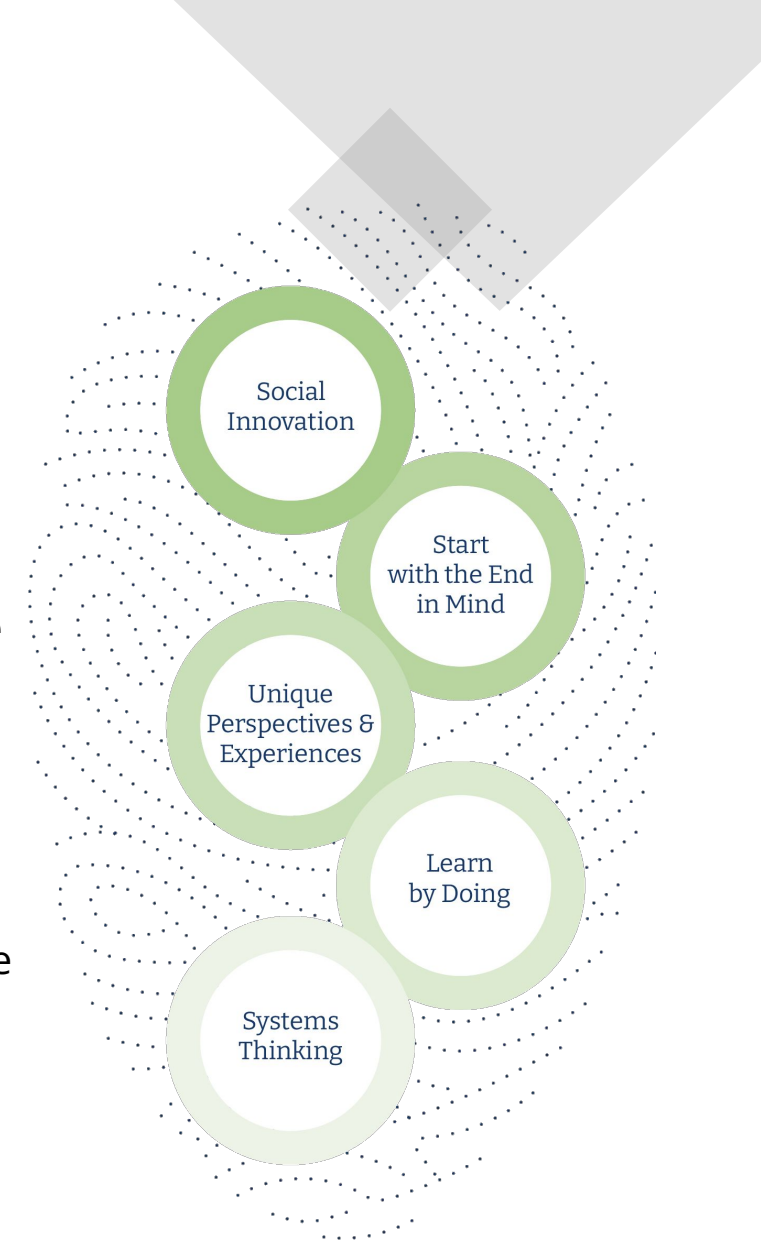
# Circular Construction Innovation Hub

## OVERVIEW

### What is it?

Designed as a social and technical **innovation lab**, CCIH is a multi-stakeholder initiative that supports **coordination** across industry and government, **knowledge sharing**, and **capacity building** across the entire value chain to **accelerate the adoption of circular practices** within Canada's construction and real estate sector.

The 'Hub' will serve as a central point for coordination and knowledge sharing. The 'Spokes' of the Hub will consist of regional 'test beds' where Hub partners will undertake on-the-ground research, demonstration projects, and pilots to demonstrate circular strategies in practice, learn by doing, and tackle innovation challenges across various work streams. The results and successes from the research and case studies will be shared through the Hub and amplified accordingly with key audiences.



# Circular Construction Innovation Hub

## BACKGROUND

- CCIH is a platform and mechanism for mobilizing construction and real estate sector stakeholders in line with a '*Strategic Framework for Action*'.
- The *Strategic Framework for Action* was developed as part of a project for advancing a circular built environment in Canada, co-led by CELC and CSA Group in collaboration with industry and government partners – designed to enable systems change over time ([See Report](#)).
- The *Strategic Framework for Action* highlights the importance of 'removing frictions', 'learning by doing through demonstration projects', then 'celebrating wins and amplifying best practices'.



### Strategic Advisory Committee



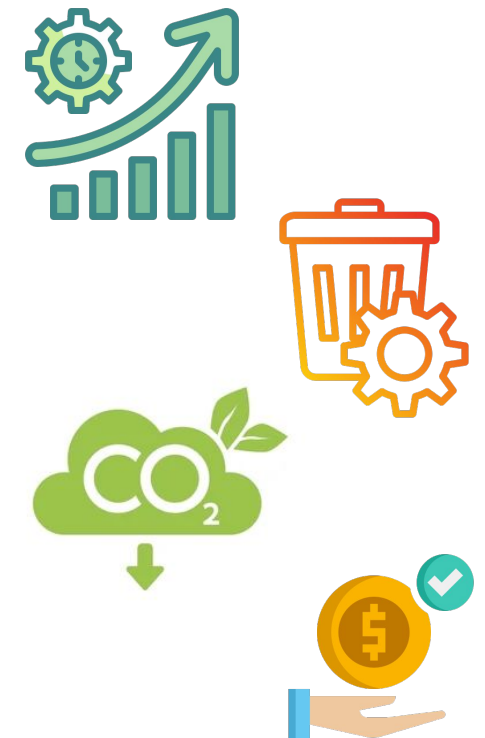
# Circular Construction Innovation Hub

## VISION & GOALS

The vision and goals for CCIH will be established by the partners within the Hub, with work being highly outcome focused and impact driven.

**Specific goals** may include the following:

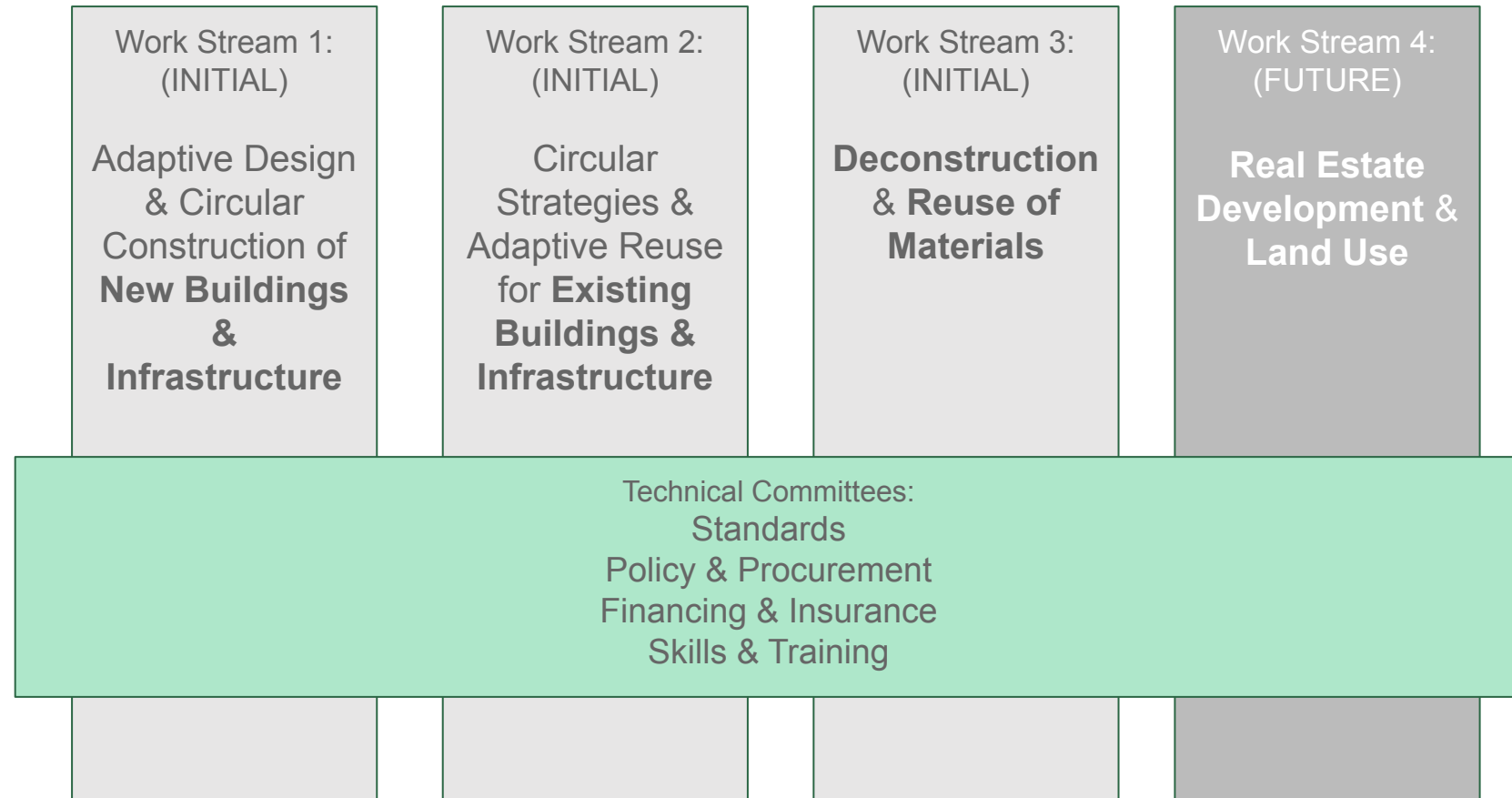
1. **Increase the resource productivity** of Canada's construction sector through circular strategies
2. **Reduce the amount of waste** coming from Canada's construction and buildings sector.
3. **Reduce the embodied carbon** of construction materials used for both new and renovation construction in Canada.
4. **Others** (e.g., affordability, resilience)



# Circular Construction Innovation Hub

## WORK STREAMS

- Work streams and projects will be organized around 3 initial themes.
- Technical Committees will provide support to Working Groups within the work streams to support 'learning by doing'.
- Circular Economy Leadership Canada (CELC)\* will act as Secretariat for the CCIH to support coordination and knowledge sharing.

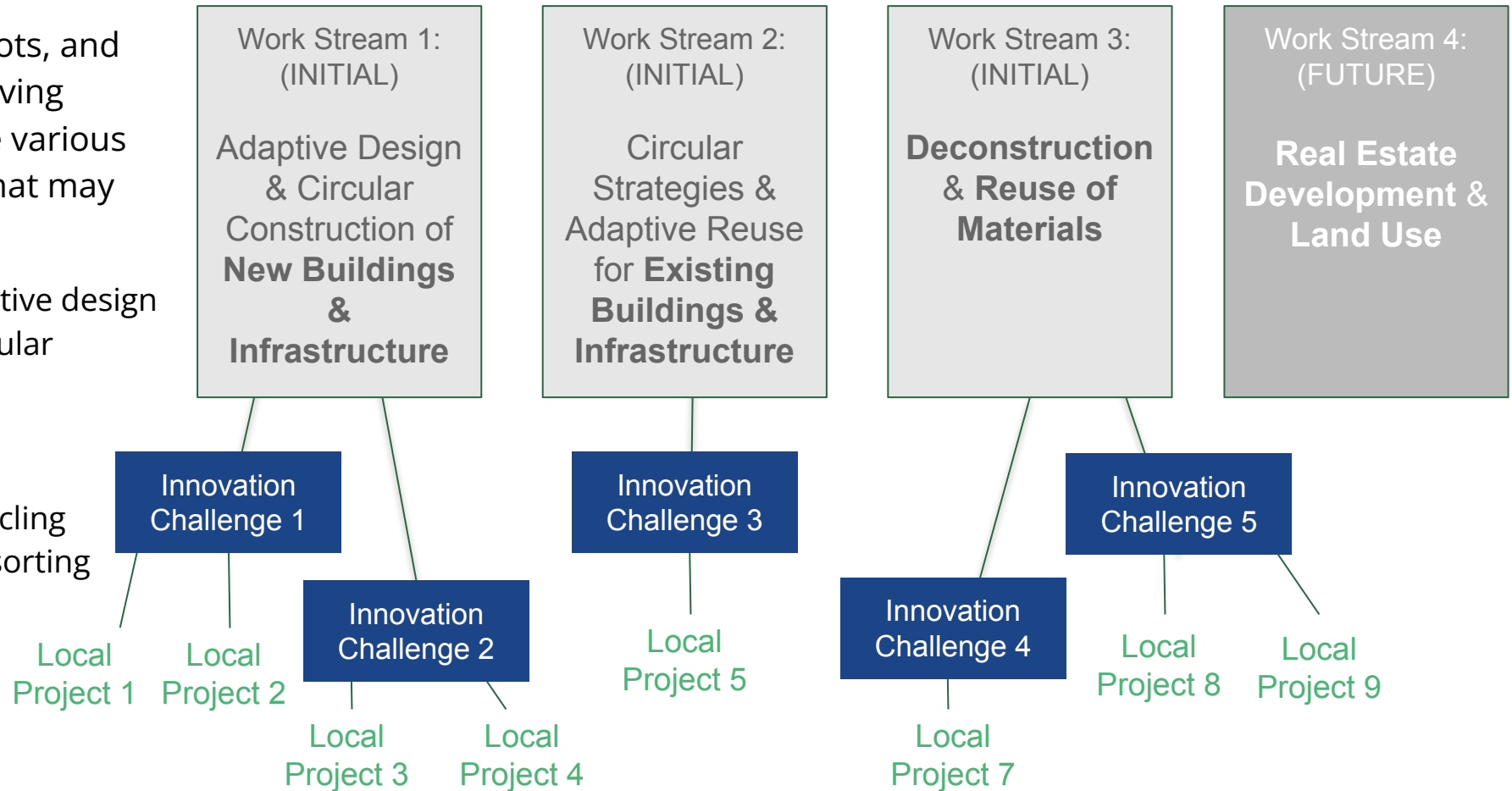


# Circular Construction Innovation Hub

## FOCUS AREAS

Local demonstration projects, pilots, and applied research will focus on solving 'Innovation Challenges' under the various work streams, with focus areas that may include:

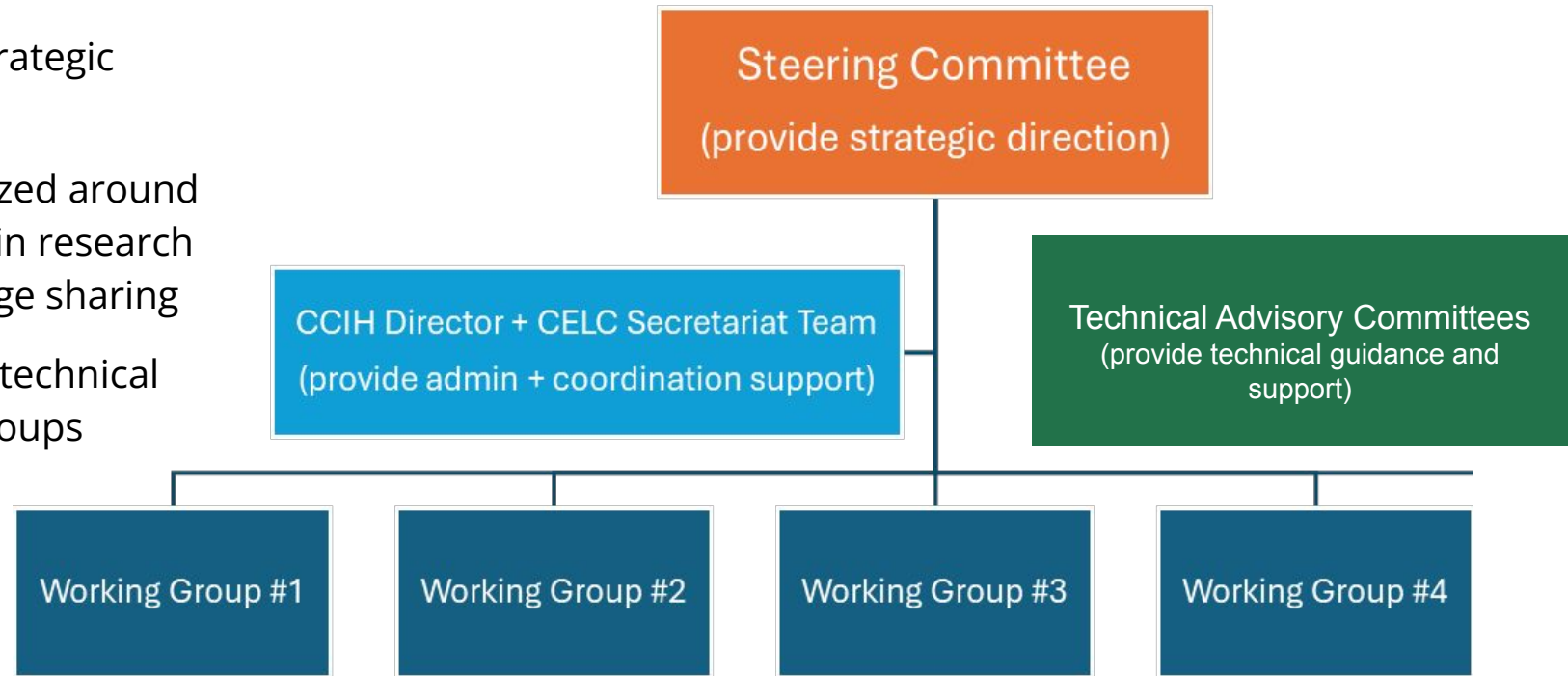
- Design for disassembly / adaptive design
- Lean manufacturing and modular construction
- Adaptive reuse
- Innovative leasing
- Renovation and material upcycling
- Deconstruction and material sorting
- Material testing and reuse
- Others



# Circular Construction Innovation Hub

## GOVERNANCE

- CELC will act as CCIH Secretariat
- Steering Committee will provide strategic direction and guidance
- Structured Working Groups organized around Innovation Challenges will engage in research and projects and support knowledge sharing
- Technical Committees will provide technical guidance in support of Working Groups



# Circular Construction Innovation Hub

## PARTNERS:

### Partners (initial expressions of interest)

- **Industry / Businesses** (Mantle Developments, TAS Impact, Northcrest, Perkins & Will, Arup, JLL, Lehigh Hanson, Geocycle, PLAEX, Viking Recycling, Ouroboros, Green Salvaged Materials, others)
- **Industry Associations** (CCA, CHBA, BOMA Canada, Canadian Wood Council, Cement Association, Climate Smart Building Alliance, others)
- **Federal Government** (Environment & Climate Change Canada, Natural Resources Canada, National Research Council, Centre for Greening Government)
- **Provincial & Local Governments** (RECYC-QUÉBEC, Metro Vancouver / NZWC, Vancouver, Richmond, Edmonton, Toronto, Halifax, others)
- **Academic & Professional Bodies** (BCIT, University of Ottawa, Ivey School of Business, ETS / CERIEC, BC Centre for Women in Trades, Royal Architecture Institute, Engineers Canada, others)
- **NGOs** (Light House, Smart Prosperity Institute, CSA Group, Carbon Leadership Forum, others)



# Circular Construction Innovation Hub

## FUNDING MODEL:

- Proposed as a cost share initiative between industry, government, academic, and NGO partners under a diverse funding model
- Funding to come from a potential combination of sources (to be confirmed / validated), such as:
  - Industry sponsorship
  - Cost-share between regional spoke partners
  - Project-based funding (for pilot and demonstrations and technical research)
  - Design and Innovation Challenge funding
  - Grants and foundation funding

### **Proposed 'Regional Spoke' Funding Model**

More specific to the funding for 'regional spokes' (e.g., Metro Vancouver, Greater Toronto, Montreal, etc.), local partners with each regional spoke will provide an annual financial contribution (as a cost-share arrangement) in support of the Hub and its related supports / services.

The Hub will provide the following services / supports to each regional spoke:

- Coordinated knowledge sharing from across the Hub and its network (as well as other regionally-based spokes), including access to an online knowledge sharing platform
- Strategic guidance and coordination to support demonstration project selection and targeted research
- Support with partnership development to advance new projects, research, demonstrations, and scaling
- Support with finding matching funding for local projects and research
- Support with developing case studies and environmental and socio-economic metrics linked to local projects, pilots, and demonstrations to quantify and learn from successes and challenges
- Development of policy briefs and recommendations for provincial and federal levels
- Access to technical committees and experts (policy / procurement, standards, financing / insurance, skills training, etc.)

# *Circular Construction Innovation Hub*

## **PROJECTS & PILOTS:**

### **Sample of Potential Projects, Pilots, and Research (under exploration)**

#### Salvaged Materials into New Projects

1. Design Challenge for demonstration house using salvaged materials (PLAEX - New Brunswick)

#### Adaptive Reuse

2. Home relocation projects in Metro Vancouver (Light House)
3. Building life extension / adaptive reuse projects (TAS)

#### Deconstruction / Material Reuse

4. YMCA project in Toronto (Mantle Developments and Ouroboros Deconstruction)
5. Deconstruction projects (City of Richmond, City of Vancouver, VEMA Deconstruction)
6. Material reuse sorting and testing facility (Viking Recycling)
7. Building Material Exchanges (Light House and Green Salvaged Materials)

#### Cross-cutting

8. Professional and trades training (BCIT)
9. Standards development and testing (CSA Group)

# Circular Construction Innovation Hub

## Taking a Phased Approach to Systems Change and Sector Transformation

Timeline (Q3 2024 - 2027+)



\* See Appendix II for an overview of *Innovation Challenge Briefs*



# Circular Construction Innovation Hub

## NEXT STEPS:

### Priority Actions for Fall 2024 (Phase 1: Mobilize & Focus)

1. **September-October:** Engage stakeholders who previously expressed interest in partnering to provide updates and identify potential pilots / research projects. **(Completed)**
2. **October:** Convene small group of stakeholders to draft vision, purpose / objectives, and focus areas (identify areas for developing Innovation Challenge Briefs) **(Completed)**
3. **October-November:** Draft 10-12 Innovation Challenge Briefs\* with core partners (including CSA Group, Innovation North, and NZWC) within 3 initial work stream areas, and map to broader strategic 'action plan' framework. **(Completed)**
4. **November 24 & December 2:** Host stakeholder scoping workshops with interested parties / partners to refine draft vision and objectives, select innovation challenges to prioritize in the near-term, and finalize governance and funding model. **(Completed)**
5. **December-January:** Confirm partners and funding to ***launch Phase 2 in early 2025.***



[www.circulareconomyleaders.ca](http://www.circulareconomyleaders.ca)

## CONTACTS

**Paul Shorthouse**  
Managing Director,  
Circular Economy Leadership Canada  
[pshorthouse@circulareconomyleaders.ca](mailto:pshorthouse@circulareconomyleaders.ca)

**Raphael Lopoukhine**  
Director of Strategic Initiatives,  
Circular Economy Leadership Canada  
[rlopoukhine@circulareconomyleaders.ca](mailto:rlopoukhine@circulareconomyleaders.ca)



# APPENDIX I: About CELC



A Solution Space by  
**Generate Canada**



# About CELC

**Circular Economy Leadership Canada (CELC)**, a solution space of the national not-for-profit charity Generate Canada, is working to connect Canada's circular economy community and serves as a bridge to similar networks around the world.

We provide **thought leadership**, **technical expertise**, and **collaborative platforms** for accelerating systems change and the transition to a low carbon, circular economy in Canada.

CELC has been actively working with the construction and real estate sector for the last 3 years to advance a circular built environment.

[www.circulareconomyleaders.ca](http://www.circulareconomyleaders.ca)



- Champion a national approach to CE
- Serve as a national hub and international bridge
- Share evidence on benefits of CE
- Focus on critical enablers for advancing circularity
- Accelerate CE transitions in strategic sectors
- Supporting convening and relationship building across CE ecosystem

# CELC Work Stream

## Circular Built Environment

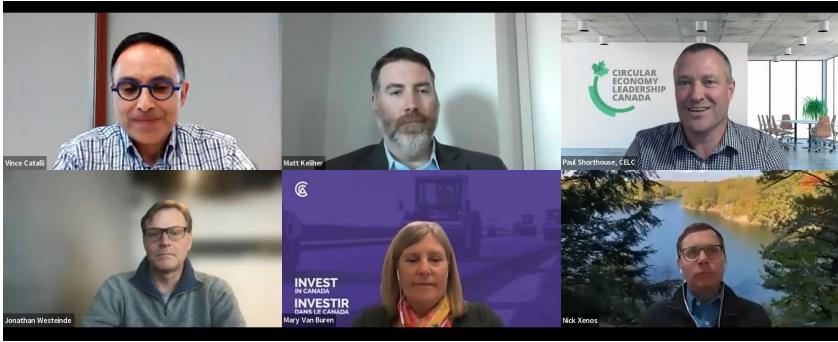
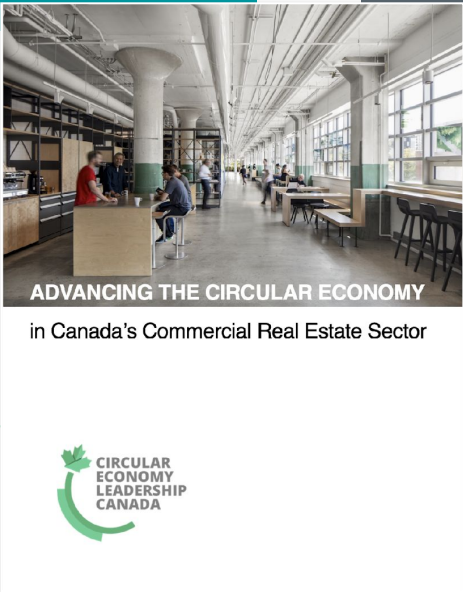
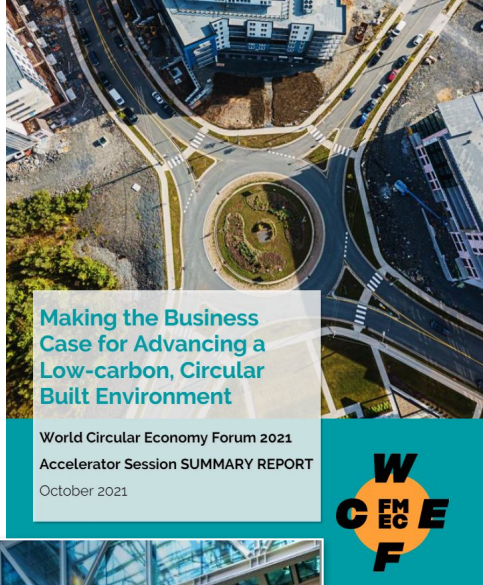
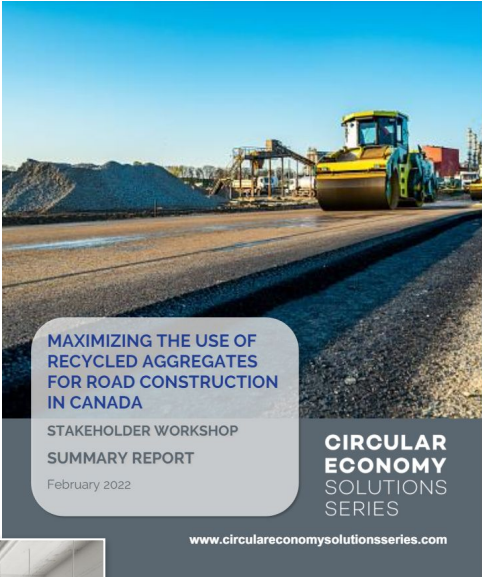
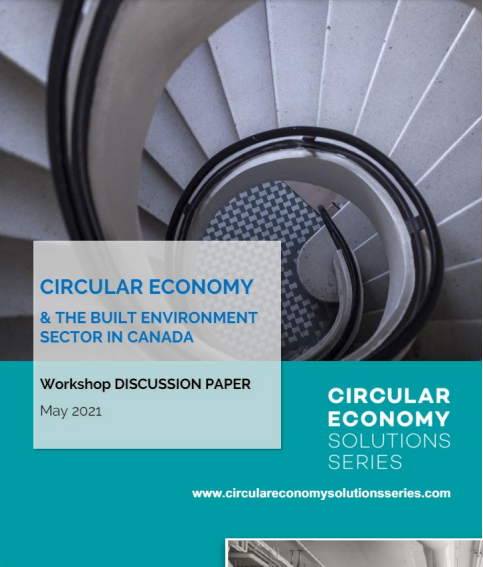
- CELC's Circular Built Environment work stream goes beyond a focus on construction waste to encompass the entire built environment and real estate ecosystem in Canada.
- Recent projects and ongoing initiatives are:
  - Exploring the business case for circular strategies and extending the life of existing buildings
  - Identifying the policies and standards needed to support circularity in the construction and real estate sector
  - Working with industry to develop an action plan and launch a *Circular Construction Innovation Hub* inline with the recently published Strategic Framework for Action.





# CELC Work Stream

## Cumulative Body of Research & Engagement







# APPENDIX II: Theory of Change



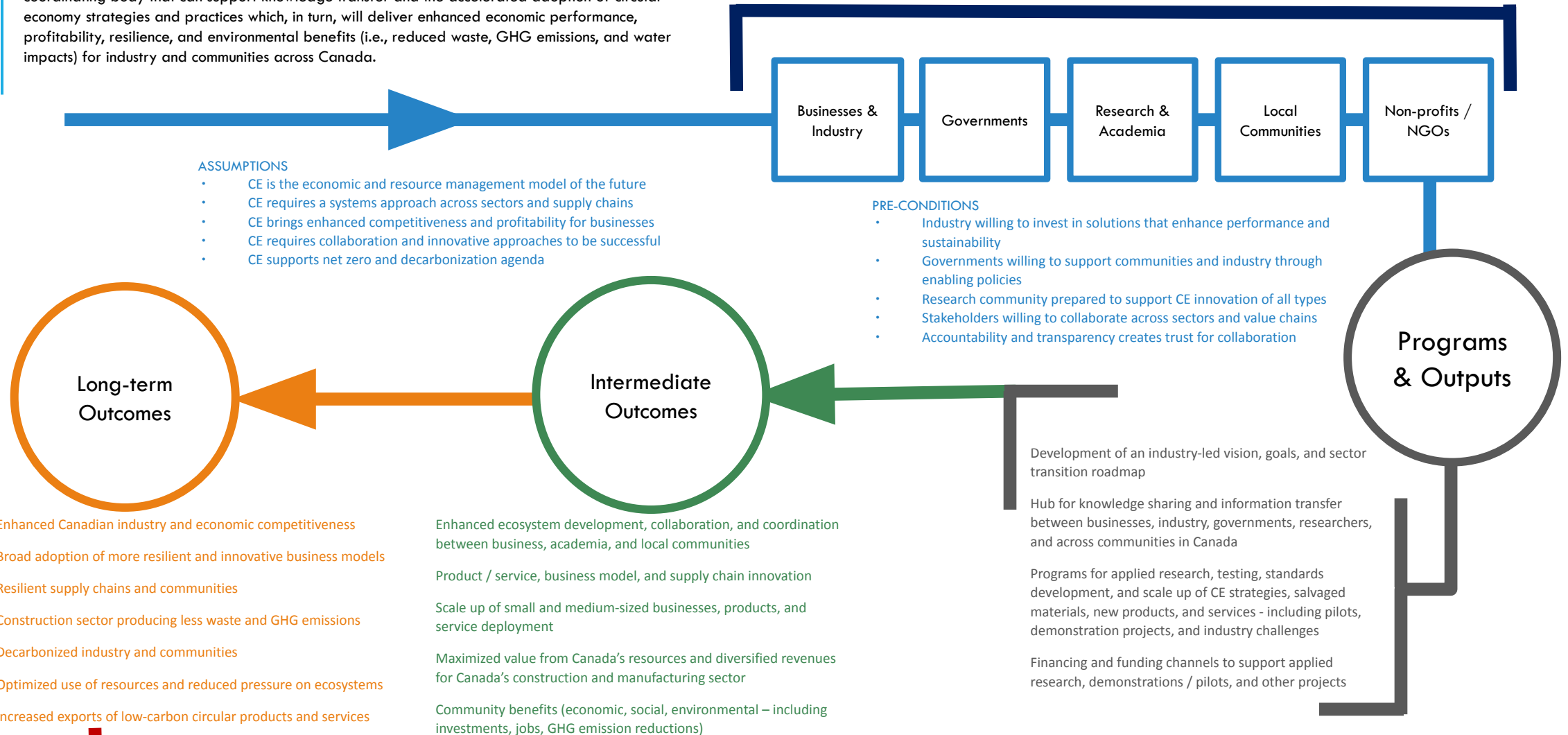
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# CCIH: THEORY OF CHANGE

**OPPORTUNITY STATEMENT:** Canada's construction and real estate sector would benefit from a coordinating body that can support knowledge transfer and the accelerated adoption of circular economy strategies and practices which, in turn, will deliver enhanced economic performance, profitability, resilience, and environmental benefits (i.e., reduced waste, GHG emissions, and water impacts) for industry and communities across Canada.

## CIRCULAR CONSTRUCTION INNOVATION HUB (CCIH)



Adaptive Design – Adaptive Reuse – Deconstruction – Land Use

WORKSTREAMS

**CCIH IMPACT** Innovative, economically competitive, resilient, and environmentally sustainable construction sector in Canada producing less waste and aligned with Canada's climate change / net zero goals



An aerial photograph of a roundabout with a central green island. The road is paved and has white dashed lines. The surrounding area includes green grass, trees, and a small body of water on the right side. The text is centered over the green island.

**APPENDIX III:  
Innovation  
Challenge Briefs**



# Overview:

# Innovation Challenge Briefs

## **Background on *Innovation Challenge Briefs***

To overcome the inertia required to change the current linear construction system, innovation must be strategically applied to address systemic barriers.

By 'shrinking the systems change' into manageable pieces, figuring out what works and what doesn't, addressing the pain points, and improving the business case, circularity can increasingly become the standard of practice, adopted by critical stakeholders in the value chain and scaled over time.

One well-established process for shrinking the change is by developing "Innovation Challenge Briefs", which focus on clearly articulating the root causes and important solutions for enabling systems change over time.

# Overview:

# Innovation Challenge Briefs

## What are *Innovation Challenge Briefs*?

Innovation Challenge Briefs are critical guiding documents for tackling the barriers and identifying the best innovation pathways within the system, helping to position and frame specific system challenges into narrative documents.

More specifically, Innovation Challenge Briefs consist of:

- A clear statement of a specific problem (root causes, key stakeholder groups, etc.) and systemic barrier.
- A discussion of why it matters (what's at stake and why now).
- An articulation of other factors impacting the specific systemic barrier and what's needed (prioritization of gaps that need to be filled).
- Identifying a set of strategic solutions pathways (e.g., design criteria and challenges, demonstration and pilot projects, research, etc.) and factors to measure in order to prove out solutions and tackle the systemic barrier (i.e., who is doing work in this area, what solutions have already been explored, etc.).



# Overview:

# Innovation Challenge Briefs

## How do *Innovation Challenge Briefs* Support Systems Change?

Innovation Challenge Briefs transform specific problems and barriers into **actionable projects**. Practically speaking, an Innovation Challenge Brief is a valuable tool for:

1. Gaining political and institutional support around a demonstrated need or opportunity.
2. Building a team around a set of defined objectives.
3. Going after grant funding or early stage investment for the development of potential solutions, pilot and demonstration projects, and research.

By taking stock of existing knowledge on the issues and barriers and taking time to properly distill the challenges and innovation pathways through the Briefs, more strategic and coordinated efforts and investments can be made to effectively bring forward solutions to enable systems change.

This ensures an informed approach toward innovation – one that is grounded in evidence and focused explicitly on the achievement of strategic impact. Such an orientation ensures that innovation is never taken up as an end in itself, but is rather the means by which to achieve positive impact within the construction and real estate sector.