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# Circular Economy Principles for Canada's Commercial Real Estate Sector

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# CSA Group At-a-Glance

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## Standards Development Organization

## Commercial Subsidiaries



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The mission of CSA Group's Standard Development organization is to **enhance the lives of Canadians** through the **advancement of standards** in the public and private sectors.



Improving health, safety, the environment and trade in Canada and beyond.

12

Areas of focus

+11,000

Dedicated members

+3,000

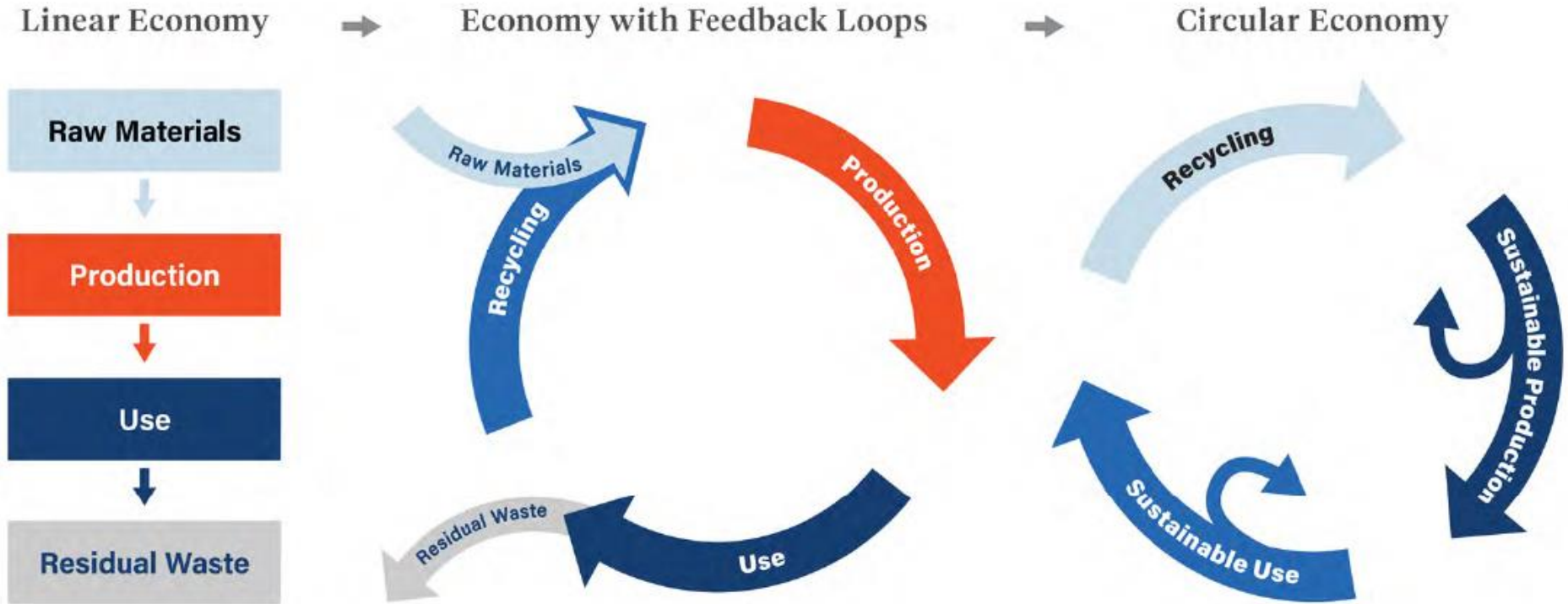
Standards

+1,000

Committees

# Circular Economy Principles

## Typical Life Cycles of Buildings and Their Components



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“Circular strategies” means rethinking the design, construction, usage, operational processes, and end of life, so that they can be repaired, reused, recycled, or transformed.

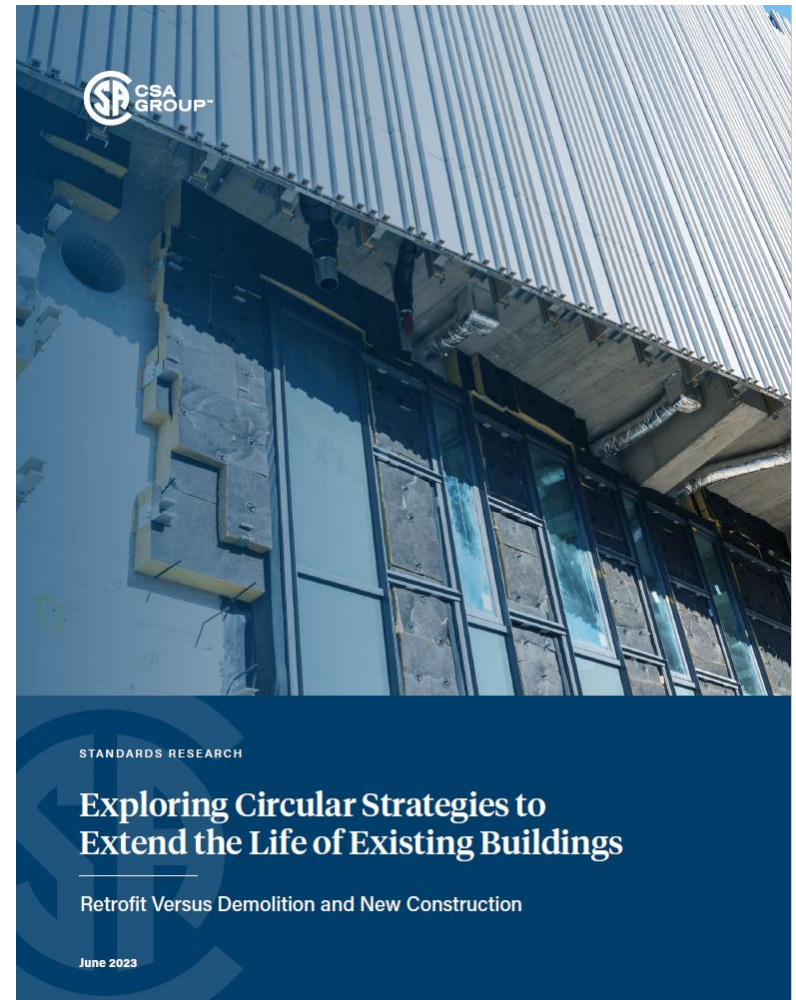
# The Issue

- Construction and operation of nonresidential buildings comprises about 10% of energy related CO2 emissions globally
- Developing new buildings may conflict with achieving greenhouse gas (GHG) emission reduction targets.





# CSA Group Research



# Opportunities to Apply Circular Strategies to Existing Office Building

This report provides guidance and best practices on extending the lives of existing office buildings by looking at:

- **Design interventions** for optimizing an existing building;
- Ways to **minimize waste generated** from maintenance, renovation activities, and end of life;
- Construction material flows and **reuse** of salvaged materials



# Circular Strategies to Extend the Life of Existing Office Buildings: Circular Design Strategies

- Durability and longevity of buildings starts with efficient design
- Opportunities for adaptive transformation
- Upgrades and Renewals
  - Building Upgrades
  - Additions and Expansions
  - Changes of Use and Conversions



# Circular Strategies to Extend the Life of Existing Office Buildings: Reuse strategies

- Existing buildings that are refurbished or decommissioned represent a vast source of future building material
- **Deconstruction**
  - Disassemble the building in a way that preserves the value and utility of the materials
- **Secondary Materials Markets**
  - Markets that support trade in used construction resources are foundational to the success of a circular construction economy



# Circular Strategies to Extend the Life of Existing Office Buildings: Under utilized circular strategies

- Whole Building Life Cycle Assessment (wbLCA)
- Digitalization of Design and Construction
  - Building Information Modelling



## Policy Drivers

Policies, economic measures, regulations, and voluntary programs can all be used to encourage circular practices in existing office buildings



# Standards as Solutions

- Standardization can help to ensure that information and practices are done consistently, accurately and are comparable
- Standards for Low Embodied Carbon Design and the Use of Sustainable Construction Materials:
  - CSA Z782-06, Guideline for Design for Disassembly and Adaptability in Buildings
  - CSA S478:19, Durability in Buildings
  - ISO 21930:2017, Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services



## Gaps and Opportunities

- Standardization for renovations and adaptive reuse
- Standards should encourage a “renovation first” philosophy
- Terms such as “restoration”, “retrofit”, “renovation”, “alteration”, “refurbishment”, and “renewal” need to have standard definitions
- A BIM strategy would establish a management framework to enable more resource-efficient uses of materials





## Conclusion

- The conditions are ripe for the office building sector to focus on extending the lives of existing offices, contributing to the emerging circular economy
- Economic and environmental trade-offs: managed through analytical methods such as life cycle assessment (LCA)
- A combination of private sector financing, public policy, standards, and industry could help implement and scale circular strategies







# Thank you.

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