

Commercial readiness of building decarbonization technologies in large-scale real estate: a Canadian perspective

March 2025

Key pillars of building decarbonization

Sustainable construction



Low-carbon concrete; Mass timber construction; Prefabricated building components; High-performance building envelopes; Recycled and upcycled construction materials; Green roofs and living walls; Passive solar design; Structural insulated panels (SIPs); Aerogel insulation; Phase change materials for thermal management; Self-healing concrete; 3D-printed building components; Modular construction systems; Geopolymer cement; Transparent wood composites

Smart building systems



Building Management Systems (BMS); IoT-enabled sensors and controls; Al-driven HVAC optimization; Smart lighting systems with occupancy and daylight sensors; Energy monitoring and analytics platforms; Automated fault detection and diagnostics; Smart meters and submetering systems; Integrated security and access control systems; Predictive maintenance software; Digital twin technology for building operations; Smart window systems; Demand-response enabled appliances and systems

Residential solutions



High-efficiency heat pumps; Smart thermostats; Energy-efficient appliances; LED lighting with smart controls; Home energy management systems; Solar PV systems with battery storage; High-performance windows and doors; Spray foam insulation; Heat recovery ventilation systems; Smart water heaters; Dual-fuel heating systems; Radiant floor heating; Zoned HVAC systems; Smart power strips and plug load controllers; Residential energy monitoring systems

Commercial building optimization



Building automation systems (BAS); Chiller plant optimization; Variable air volume (VAV) systems; Demand-controlled ventilation; LED retrofits with advanced controls; Retro-commissioning and continuous commissioning services; Energy management information systems (EMIS); High-efficiency boilers and furnaces; Variable frequency drives (VFDs) for motors and pumps; Thermal energy storage systems; Building envelope upgrades; Heat recovery systems for HVAC and industrial processes

Note: Examples of relevant climate technologies included, prioritizing those with high Technology Readiness Levels (TRLs).



Decarbonization commitments and strategies of major firms

Company	Net-zero target	Decarbonization initiatives	Ecomphymipsis
FLUOR.	2023 (scope 1 and 2)	"Building a Better Future" strategy focusing on energy transition; targeting decarbonization projects in hard-to-abate sectors (cement, steel)	
ACCON	2050 (scope 1, 2 and 3)	Aecon Green Energy Solutions division for renewable and efficiency projects; Pilots with innovative materials (CarbiCrete)	
A=COM	2040 (reduce scope 1, 2 and 3 emissions by 90% and offset the rest through high quality carbon removal projects)	Sustainable Legacies strategy; ScopeX™ carbon reduction framework integrated into all designs	
(M) JLE	2040 (scope 1, 2 and 3)	Portfolio Sustainability Program for clients; Carbon Pathfinder software and data analytics; Green leasing and tenant engagement	Batrolfi roansgamant for office portfolios (goldar clarets), Adminisp office on pract radi octable development (str. A): In reasonit sym)
Jacobs	2040 (reduce scope 1, 2 and 3 emissions by 90%)	Climate Action Plan (every project a climate opportunity); reduce scope 1 and 2 emissions 50% by 2030, and scope 1, 2 & 3 emissions 90% by 2040; Digital twin and "Evolve" sustainability tool	
BECHTEL	2050 (scope 1, 2 and 3)	Decarbonization Task Force & client advisory; Investing in renewable energy and green hydrogen projects; Internal carbon pricing for proposals	Construction of researchine tools, small farms). Statistic energy and of transit projects (reduce other building errors on rednesdy).

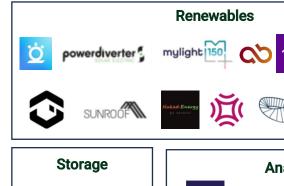
Note: Scope 1: Direct emissions from owned or controlled sources (e.g., company vehicles, machinery); Scope 2: Indirect emissions from purchased electricity, steam, heating, and cooling; Scope 3: All other indirect emissions in the value chain, including suppliers and clients.



Climate Tech Market Map for the Built Environment by Climate Insider

Residential and Commercial Solutions













Sustainable Construction















Best practices for effective building decarbonization

Key strategies > Lifecycle approach: Data & smart tech: > Policy & incentives: > Partnerships: > Risk management:

The Canadian context

Canada's **strong policies enable decarbonization**, but **regional challenges** (cold climate, aging buildings, grid differences) require **tailored approaches**. Proven solutions exist; therefore, the **priority** is **scaling deployment**.

Outlook

Decarbonization is an **opportunity**, not just compliance. Efficient buildings **lower costs**, **improve occupant satisfaction**, and **enhance asset value. Leadership and collaboration** will be **key** in turning commitments into real emissions reductions.



> Skills & culture:



The full report is available on our AI-Powered Market Intelligence Platform

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