

Development, testing & scale-up facility

CMC Research Institutes (CMCRI) has developed a facility to accelerate development, scale-up and testing of novel carbon capture and conversion technologies to reduce industrial greenhouse gas emissions.

The Carbon Capture and Conversion Institute (CCCI) actively supports Canada's effort to produce and use energy and natural resources in a cleaner and more efficient manner.

Hosted inside BC Research's Technology Commercialization and Innovation Centre, the CCCI combines state-of-the-art scale-up and testing capabilities with engineering and manufacturing expertise provided by partners BC Research Inc. Clients can develop and test a variety of capture and utilization technologies from proof of concept design through pilot-scale demonstration – all in one location.

The facility is capable of testing carbon capture technologies ranging from solvent, solid sorbents, membrane and cryogenic-based systems. In the utilization stream, the CCCI can handle processes that include thermal, chemical and electrochemical technologies. We also accommodate the development and testing of other process-related, emissions-reducing technologies including process efficiency, measurement, energy storage, and biomass conversion.

At the CCCI, we help innovators:

- Design, build and test prototypes for investor demonstrations
- Reduce the cost and time of technology development
- Secure business development support through partnership with incubators/accelerators
- Preserve intellectual property (fee for service only)

Through its Energy Innovation Program, Natural Resources Canada (NRCan) provided significant financial support to design and build this modern, multi-purpose facility. The BC Innovative Clean Energy Fund also contributed financial support for acquiring a new gas chromatograph with mass spectrometry (GCMS) unit for tight process control and product characterization.



Flue gas conditioning system



Multi-purpose electrochemical cell



Gas mixing unit

FACILITIES

- 35,000 sq. ft. pilot plant area with 30 ft. ceilings
- 3,000 sq. ft. fenced area with utilities
- Natural gas-fired boiler that produces up to 1 tonne/day CO₂ and up to 0.7 tonne/h saturated steam
- Simulated flue gas streams representative of oil and gas, chemical, cement and other industrial processes
- Wet chemistry lab & analytical room (GCs, GCMS, multigas analyzers, FTIR, AAS, etc.)
- Electrochemical lab with VERSASTAT4-500 voltammetry system
- 20A current buster
- Skid and pilot plant assembly shop
- Machine shop
- Testing area

Utilities	
Flue gas (unconditioned)	Up to 1 tonne/day of CO ₂
Conditioned flue gas	CO ₂ : up to 25% SO ₂ : 32 - 6000 ppm NO: 20 - 4000 ppm NO ₂ : 5 - 240 ppm CO: 20 - 3600 ppm
Steam	140 psig
Compressed air	100 psig
Cooling water	150 kW
Chilled water	50 kW
Natural gas	3 MW equivalent (~110 m ³ /hr)
Electric power	1200 A / 600V
Potable water	2" diameter line

Services: Scale up, De-Risking, Testing & Fabrication	
Pilot plant area 35,000 ft ² 30 ft ceiling	Wet lab & analytical room (GCs, GCMS, Multigas analysers, FTIR, AAS, etc.)
3,000 ft ² fenced area (serviced with utilities)	Multi-purpose electrochemical cell VERSASTAT4-500 - DC voltammetry and corrosion system 20A current buster
Machine shop	Skid and pilot plant assembly shop
Offices	Testing area and meeting rooms

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Oil free air compressor



Industrial scale gas-fired boiler



Gas chromatograph with mass spectrometer