



National Research Council of Canada

The NRC is currently hosting the Materials for Clean Fuels Challenge program, which focuses on the development of new materials for zero-emission transportation fuels and chemical feedstocks across the continuum from discovery to commercialization. Through collaborative partnerships with key stakeholders, it advances a unique initiative to bring disruptive solutions to the design, development, and delivery of clean fuels and chemicals in Canada.

AVAILABLE RESOURCES

NRC Advanced Materials Research Facility

- Aims to support materials development and commercialization
- Accelerated materials discovery and process development, including computational materials discovery, design and process simulation, high-throughput materials characterization and processing experiments, and structured materials and process databases
- Production scale-up, demonstration, and standardization, including materials and process standards development, materials synthesis and scale-up, and design and demonstration of multifunctional materials and devices
- Materials and process sustainability and safety, including cradle-to-grave materials and product life cycle assessment, health and environmental impacts and mitigation methods, and accelerated aging of materials and devices

COST OF SERVICES

Collaborative partnerships with key stakeholders including academics and SMEs in Canada and abroad (US, Germany and UK); access to facilities and expertise Canada wide; advisory committee consists of clean tech professionals from a variety of stakeholders

CONTACT INFORMATION

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EXPERTISE

The NRC team consists of research professionals and experts in chemistry, materials science, engineering, AI (artificial intelligence), robotics and technology transfer. The materials for clean fuels challenge program focuses on the following three areas: Carbon dioxide conversion, Clean hydrogen production, AI-accelerated materials discovery.



Conversion

Advanced electrolysis for chemical production and clean fuels; converting carbon capture solutions into value-added chemicals using a bicarbonate electrolyzer; anion exchange membrane development and in situ characterization for CO₂ electrolyzers; specialty chemical electro synthesis from CO₂; Life Cycle and Techno Economic Analyses for conversion technologies; CO₂ to jet fuel technology platform; renewable syngas from photocatalytic CO₂ conversion; direct conversion of CO₂-rich flue gas to syngas for power-to-liquids technologies; multi-scale computational modelling

TRL

This program services companies of TRL 1-5. Other programs exist at the NRC which support higher TRLs.