

Urban Hydrogen Hub for Grid Flexibility, Resilience, and Carbon Reduction Scalable to Nuclear Power Plant Co-location Feasibility Study

Hydrogen Innovation Fund Project Details

Proponent: Kinectrics Inc.

Partner: Bruce Power and FuelCell Energy

Project Type: Feasibility study

Project Total Cost: \$500,000

Year Contracted: 2023

Location: Toronto

Status: Open

Economic Development: 2 full time jobs created

Project Objectives

The objective of the study is to assess the feasibility of hydrogen production through solid oxide electrolysis powered by a surrogate heat source to emulate a nuclear power plant, the use of fuel cells for power generation, and the storage and supply of the hydrogen as a clean fuel source for hydrogen fuel cell-powered heavy-duty vehicles. The study aims to evaluate the technical, economic, and environmental viability of a hydrogen hub at Kinectrics' 800 Kipling Avenue site in Toronto that would provide improved grid flexibility, reliability, and transportation sector carbon emissions reductions.

Outcomes

If successful, the study will provide valuable insights into the use of hydrogen as an energy carrier within the electricity system, considerations for installation of equipment and infrastructure such as hydrogen production systems, fuel cell systems, hydrogen storage tanks, dispensing equipment, pipelines, and fueling stations for heavy-duty vehicles. The expected learnings include:

- Techno-economic, environmental and social impact assessment of hydrogen production through solid oxide electrolyzers, including installation, maintenance, and operational costs of the hydrogen production, storage, distribution, and power generation infrastructure.
- Assessment of the potential grid reliability and flexibility provided by hydrogen as an energy storage solution to help manage surplus or peak demand periods on the grid

- Assessment of a potential market, demand, and viability of hydrogen production from solid oxide electrolyzers to better understand of how to can be scaled it up and co-located with Nuclear power plants