Interruptible Hydrogen Generation Pilot

Hydrogen Innovation Fund Project Details

Proponent: Emerald Energy from Waste Inc.

Partner: GHD

Project Type: New Facility

Project Total Cost: $6,260,007

Year Contracted: 2023

Location: Brampton

Status: Open

Project Objectives

The objective of this project is to design, install and construct a 1MW Proton Exchange Membrane (PEM) electrolyzer for the purposes of demonstrating its capability to produce hydrogen and provide grid services. The electrolyzer will be sited behind-the-meter and powered by Emerald's existing energy-from-waste generation facility, and will be tested for its capabilities to provide existing and new grid services, such as operating reserve, energy, frequency regulation and the smoothing of renewable generation.

The project also aims to develop a 400 kg on-site hydrogen production and storage hub to dispense hydrogen to nearby market ready customers (heavy trucks and off-road construction equipment), as well as advancing the wider hydrogen economy by developing relationships with local hydrogen off-takers.

Outcomes

If successful, this project will demonstrate how Emerald's energy-from-waste generation facility can produce hydrogen to supply the transportation sector as it decarbonizes, while simultaneously supporting the grid during system events or times of peak electricity demand.

Expected learnings, include:

- Test electrolyzer accuracy, ramping ability and response time, demonstrating its potential to provide existing or new ancillary services.
- Assess electrolyzer performance for grid services such as operating reserve and energy
- Analysis of combined performance of the electrolyzer and associated generator.

- Commentary on how a behind-the-meter electrolyzer can support the bulk electricity grid for the purposes of balancing and strengthening Ontario's electricity system while also contributing to the broader decarbonization of local economies.
- Developing Ontario's hydrogen economy by establishing a local hydrogen hub supplied by a reliable, sustainable source of hydrogen and exploring a pricing structure that will facilitate the growth of the regional hydrogen economy.