

Hydrogen Fueled Electric Power – Level 3 Charging Station

November 26, 2024



Sturgeon
C O U N T Y

Pilot Project Background

Demonstrate Technology Readiness for Hydrogen Fueled Electric Power

- Off-grid hydrogen-fueled electric vehicle (EV) level 3 (DC Fast Charging) station
- Liquid Organic Hydrogen Carrier (LOHC) technology

Canadian Armed Forces (CAF) Led Project (*3-Year Demonstration Project*)

- Greening Government Fund application to be submitted Dec 2024
- **Letter of support and cash contribution of C\$25,000 requested of Sturgeon County by November 29th, 2024.**

Total Project Budget – C\$973,344

- Canadian Armed Forces: C\$948,344
- Sturgeon County: C\$25,000

Technical background

The pilot project involves installing an off-grid hydrogen-fueled electric vehicle (EV) level 3 (DC Fast Charging) station at CFB Edmonton.

- Pilot project has the potential to reduce strain (demand) on electrical infrastructure, avoid costly electrical infrastructure distribution upgrades, while offering sustainable and cost-effective high-speed charging.

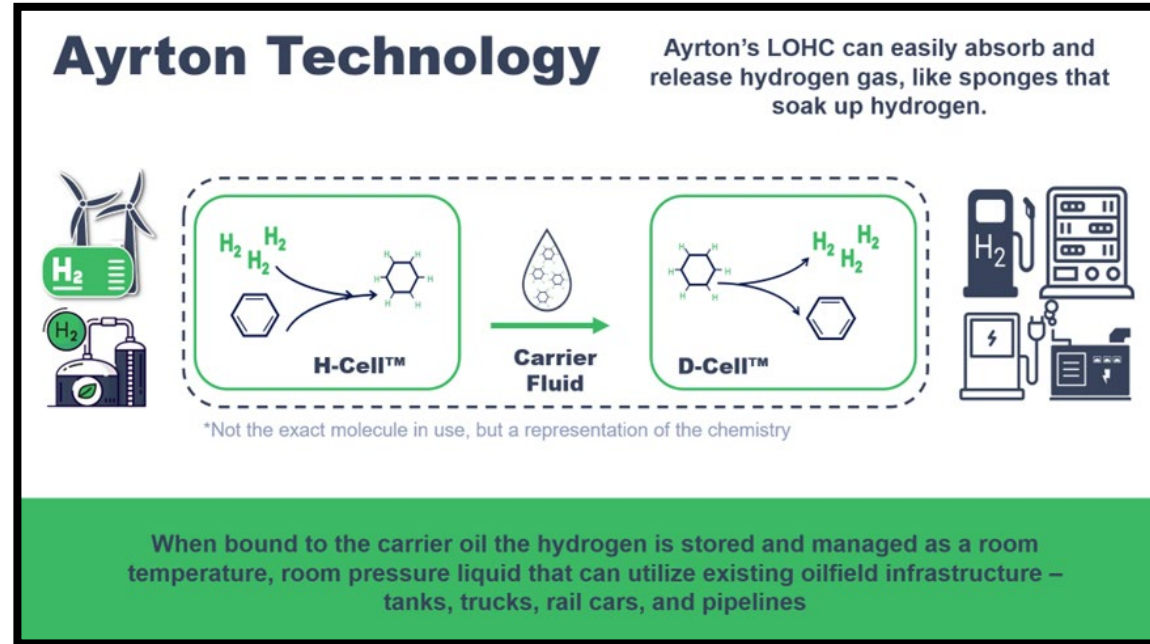
The pilot project will use liquid hydrogen as fuel serving an off-grid EV charging station.

- Hydrogen is bonded with a **liquid organic hydrogen carrier (LOHC)** fluid, so that it may be transported and stored as a liquid using regular tank trucks, tanks, and pipelines.
- An Alberta based company (Ayrton Energy) has developed a patented process to use **liquified hydrogen** without having it cooled to cryogenic temperatures.

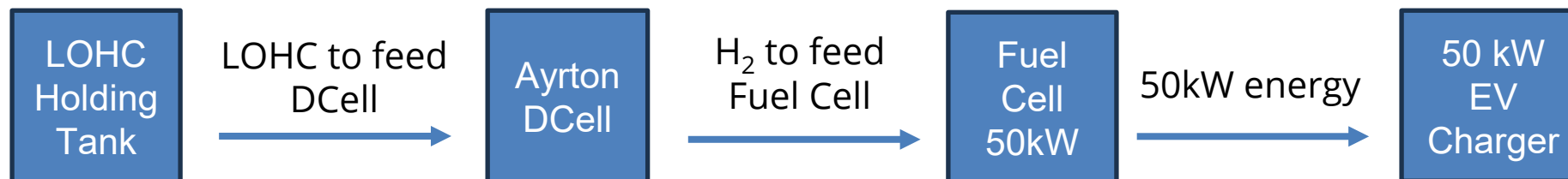
Properties	Liquid H ₂	H ₂ Gas	Battery Storage
Volume	Low	Low	Medium
Energy Density	High	Medium	Low
Weight	Light	Light	Heavy
Toxicity	Non-Toxic	Non-Toxic	Toxic

Technical background cont...

Ayrton Energy (Alberta based company)



Energy Flow Diagram



Safety and Benefits

Safety

- Liquid hydrogen is non-toxic and treated as a **Class 3 flammable** (ex: paints, alcohols, gasoline, diesel, perfumes, and hand sanitizer)

Benefits

- **Reduces the energy demand**, and emissions, on the existing electrical infrastructure.
- Off-grid hydrogen charging station can provide energy in **remote locations**.
- The project can **influence policies and standards**.
- Administration will gain understanding of LOHC carriers and fuel cell operations.
- **Educational collaborations** in hydrogen technology and sustainable energy.
- **Enhance relationships** with CFB Edmonton

Strategic Alignment

Project aligns with the Corporate Strategic Plan in the following areas:

- Carbon Neutral Municipal Operations
 - *“Achieve carbon neutral municipal operations by considering benchmarks that reflect Environmental, Social, and Governance (ESG) measures.”*
- Clean Energy Economic Ecosystem
 - *“Support long-term transition to a low carbon economy, prioritizing hydrogen and other clean energy production.”*
- Operational Excellence
 - *“Future focused thinking to proactively respond to emerging opportunities and challenges.”*

Project Schedule and Finances

Project Anticipated Timeline

- GGF Submission: December 20th, 2024
- GGF Decision: June 30th, 2025
- Project Pre Start-up: July, 2025
- Project Start-up: April 1st, 2026
- Construction: September 2026
- Commissioning: October 2026

Financial Implications

- Greening Government Fund (GGF): C\$948,344 funding sought under the Government of Canada program
- Sturgeon County: A one-time payment of **C\$25,000** (2.5% of project cost) in **FY25/26** has been requested by the CAF.

Funding Timeline	2025-2026	2026-2027	2027-2028	2028-2029	Total
GGF Funding sought:	\$0	\$905,644	\$21,350	\$21,350	\$948,344
Sturgeon County*:	\$25,000	\$0	\$0	\$0	\$25,000
Estimated project cost:	\$0	\$930,644	\$21,350	\$21,350	\$973,344



Questions?

Thank you!