ALBERTA INNOVATES

# CLEAN ENERGY

CLEAN TECHNOLOGY

HYDROGEN CENTRE OF EXCELLENCE

FUNDING DETAILS

# First-of-a-Kind Cryo-Compressed Hydrogen Demonstration in Class 8 Trucking

Verne is developing the first demonstration of a Class 8 truck powered by cryo-compressed hydrogen. Cryo-compressed hydrogen allows hydrogen to be cheaply stored in its densest state, maximizing range and payload for heavy-duty vehicles like Class 8 trucks. Verne will work with Alberta-based Diesel Tech Industries (DTI), to retrofit a diesel truck to run on cryo-compressed hydrogen and diesel using a "dual-fuel" combustion engine. Verne will then work with Alberta Motor Transport Association (AMTA) and Alberta-based fleets to demonstrate the benefits of cryo-compressed hydrogen trucks when operating in Alberta.

**RECIPIENT:**
Verne

**PARTNERS:**
Diesel Tech Industries (DTI)
AMTA

**TOTAL BUDGET:**
$7,380,000

**AI FUNDING:**
$2,000,000

**PROJECT DATES:**
JAN 2024 – JAN 2026

**PROJECT TRL:**
Start: 5
End: 7

## APPLICATION

Verne will demonstrate the first Class 8 truck powered by cryo-compressed hydrogen ($CcH_2$). A diesel engine truck will be retrofitted with dual-fuel (hydrogen-diesel) technology from Alberta and with Verne's high-density $CcH_2$ storage. Verne and collaborators in Alberta will pilot the truck and a mobile refueler in Alberta. Verne's $CcH_2$ storage systems can also power fuel cells and hydrogen engines and are suitable for all heavy-duty segments where range, payload and vehicle cost are important: trucking, port equipment, and more.

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## PROJECT GOALS

Verne will demonstrate a cryo-compressed hydrogen Class 8 truck to validate the suitability of the technology in the Alberta operating environment and beyond. Through this project, Verne aims to:

- Understand the unique operating needs of the heavy-duty trucking industry in Alberta and the implications for onboard hydrogen storage systems.
- Build strong relationships with Alberta-based OEMs, fleets, infrastructure providers and ecosystem developers.
- Demonstrate the benefits of cryo-compressed hydrogen on vehicle range and payload to Alberta-based stakeholders.
- Develop awareness of and early experience with cryo-compressed hydrogen vehicles within the hydrogen ecosystem in Alberta, enabling future deployments in trucking, transit, hydrogen distribution and aviation.

## BENEFITS TO ALBERTA

Verne's project will establish Alberta as a leader in hydrogen innovation by making it one of the first adopters of $CcH_2$ technology for heavy-duty transportation. Throughout the project, Verne will support the development of Alberta's ecosystem by working with truck upfitters, technicians, infrastructure providers and fleets to share project learnings. At least 3 Alberta-based personnel will be directly involved in setting up the mobile refueling station for cryo-compressed hydrogen, integrating the truck, or operating the truck.

Long-term benefits of cryo-compressed hydrogen deployment in Alberta include environmental benefits (decarbonization of the heavy-duty transport sector responsible for almost 10% of Canadian GHG emissions), social benefits (reduction in harmful traffic emissions that disproportionately impact low-income communities), and economic benefits (establishment as a leader in the growing hydrogen market).

**1 Publication**

**3 HQP Students Trained**

**1 New Product/Service**

**190,000 kt/yr Future GHGs Reduced**

## CURRENT STATUS

### APR 2024

The project has commenced, and Verne is already making rapid progress towards its first three milestones.

### JUN 2025

Verne has designed and built the world's first Class 8 truck powered by cryo-compressed hydrogen. Verne has successfully completed initial testing of the truck, including drive testing of the vehicle in an off-road setting.