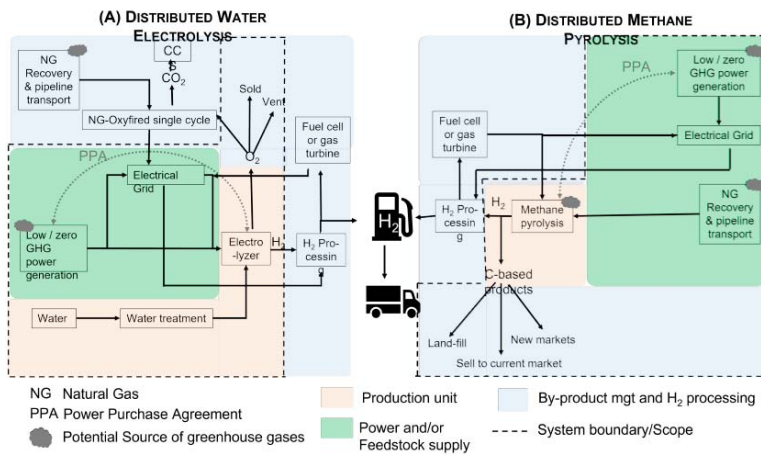


Assessing the Techno-Economic and Environmental Feasibility of Distributed Hydrogen Production Pathways to Decarbonize Heavy-Duty Transport in Alberta

Transitioning to a net-zero energy system where hydrogen is used as a fuel for heavy-duty transport, will require the creation of new value chains that make hydrogen available at a reasonable cost at widely distributed fueling stations across Alberta. The objective of this project is to analyze feasibility, cost, and emissions of producing hydrogen on-site at heavy-duty fueling stations across Alberta. The results of the study will provide insights and transfer knowledge to industry, government agencies, utilities, and investors interested in building, and/or operating heavy-duty fueling stations.



RECIPIENT:
University of Alberta



PARTNERS:
University of Calgary
The Transition Accelerator



TOTAL BUDGET:
\$400,000



AI HCOE FUNDING:
\$200,000



PROJECT DATES:
MAR 2023 –
APR 2025



PROJECT TRL:
Start: 6
End: 8

APPLICATION

The decarbonization of the heavy-duty class 8 trucks is a key priority for the province of Alberta. Class 8 trucks and other heavy-duty (HD) vehicles such as buses, trains and off-road vehicles account for 36% of total emissions from the transport sector in Alberta. The application of the project is to help the buildout of hydrogen infrastructure needed for decarbonization of Alberta's heavy-duty transport sector.



PROJECT GOALS

- Conduct techno-economic-environmental assessment of water electrolysis and methane pyrolysis-based processes to produce hydrogen at heavy-duty fueling stations located along key transport corridors in Alberta.
- Create a decision support tool that uses industry input and techno-economic models to create a decision matrix for deploying hydrogen fueling station sites across the province.
- Provide insights and transfer knowledge to industry, government agencies, utilities, and investors interested in building, and/or operating heavy-duty hydrogen fueling stations.

BENEFITS TO ALBERTA

- Development of a fuel hydrogen value chain offers a great opportunity to advance towards a clean future and creates diverse job opportunities in multiple sectors.
- The analysis, insights, and the decision support tool developed in this project can be used by industry, government agencies, utilities, and investors to deploy hydrogen technologies.
- This project could create new jobs across the value chain spanning hydrogen production, processing, distribution, transport, heating and in heavy industry.
- This would also create investment opportunities for the province, create infrastructure that supports transportation of hydrogen.



3 Publications



**3 Students
Trained**



>1000 Future Jobs



**1.6 MM t/y Future
GHGs Reduced**

CURRENT STATUS

MAY 2023

The project was kicked off in March 2023. Design for the distributed production pathways based on basic chemical engineering principle are underway.