ALBERTA INNOVATES

CLEAN RESOURCES

CLEAN TECHNOLOGY

HYDROGEN CENTRE OF EXCELLENCE

FUNDING DETAILS

Detailed Engineering Design of a Pre-Commercial Natural Gas Pyrolysis Plant for Low-Emission Hydrogen Production

VulcanX Energy Corp., a spin-out from the University of British Columbia (UBC), has pioneered a patented technology aimed at producing hydrogen and solid carbon from natural gas pyrolysis (thermal cracking) with a focus on cost-efficiency and emissions reduction. The VulcanX technology utilizes molten metals operating at high temperatures to convert methane into hydrogen and solid carbon in an oxygen-free environment. The proposed Project centers on a Front-End Engineering Design (FEED) and Detailed Engineering Design of a pre-commercial hydrogen production plant. Additionally, it encompasses research and development efforts aimed at refining the technology and exploring potential applications for solid carbon.

RECIPIENT:
VulcanX Energy Corp.

PARTNERS:
Natural Resources Canada / FortisBC / ATCO

TOTAL BUDGET:
$5,530,000

AI FUNDING:
$635,000

PROJECT DATES:
MAR 2024 – FEB 2026

PROJECT TRL:
Start: 6
End: 7

APPLICATION

The VulcanX technology produces low-cost, low-emission hydrogen and solid carbon from natural gas pyrolysis. The low-emission hydrogen can be injected into the natural gas grid, and used in ammonia, steel, and synthetic fuel production, and refueling stations. Solid carbon is a valuable material used in several sectors, such as tire manufacturing, and lithium-ion battery electrodes.

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PROJECT GOALS

- Achieve substantial advancements in R&D
  - Optimized process modeling and reactor simulation
  - Techno-economic assessments
  - Material characterization
- Improve the design of the hydrogen production plant
- Mitigate technological risks
- Facilitate investment opportunities
- Enable the commercialization of the VulcanX technology

BENEFITS TO ALBERTA

- Enable Alberta to efficiently leverage its abundant natural gas resources and infrastructure
- Utilize low-cost, low-emission hydrogen as a fuel source
- Position Alberta as a significant player in the global hydrogen economy
- Harness existing assets for economic growth
- Reduce environmental impact through the use of environmentally friendly fuel sources

6 Publications

4 Students Trained

3-5 Patents

14-25 Project Jobs

1900-2300 Future Jobs

2 New Products/Services

1 Spinoff Company

13-26 kt/yr Project GHGs Reduced

5,000-10,300 kt/yr Future GHGs

CURRENT STATUS

APR 2024

The project has commenced and is focused on developing the Front-End Engineering Design (FEED).