ALBERTA INNOVATES

CLEAN RESOURCES

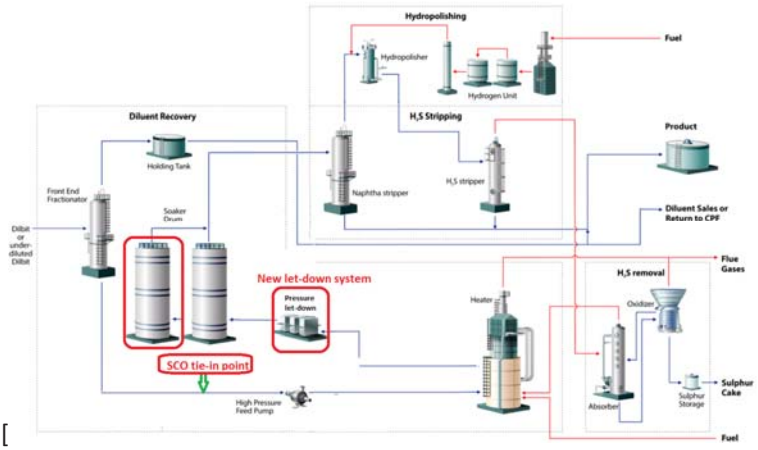
ADVANCED HYDROCARBONS

PARTIAL UPGRADING

FUNDING DETAILS

HDR Diluent Reduction Technology - Market, Product and Trial

HDR technology is a novel process based on thermal cracking of bitumen in the presence of Synthetic Crude Oil (SCO) to reduce the diluent required for bitumen transportation, improve market value and reduce energy and GHG emissions related to transportation and refining. The HDR stage 1 demo was successfully completed in 2019 and most technical objectives were achieved. The Project, located at Provost AB, builds on the success of stage 1, including demo facility modifications to optimize the process, production of a final product, conducting market and refinery assessments, and assessing lifecycle GHG impacts.



RECIPIENT:
Husky Oil Operations Limited

PARTNERS:
Alberta Innovates
NRCan

TOTAL BUDGET:
$9.9MM

AI FUNDING:
$5MM
TIER

PROJECT DATES:
MAR 2021
MAR 2023

PROJECT TRL:
Start: 7
End: 8

APPLICATION

The majority of Alberta's crude oil production is in the form of bitumen, a thick viscous fluid which needs diluent (30-40 vol%) for transportation via pipeline to U.S. refineries. Diluted bitumen typically sells at a significant discount. HDR is designed to minimize the need for diluent by lightening the crude and partially replacing diluent with locally manufactured SCO. Cenovus and other SAGD producers could benefit from the technology, reducing costs and generating jobs.

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PROJECT GOALS

- Cenovus demo plant at Provost will be modified to address the observed operational challenges.
- The Project will focus on optimizing operating conditions to generate representative HDR sample drums for refinery acceptance and evaluation.
- The Project will look to minimize the risk of commercial implementation, focusing on understanding product market pricing, product placement and acceptance.
- Successful completion of the Project will improve the project TRL from 7 to 8 (commercial ready).

BENEFITS TO ALBERTA

- Industry-wide implementation of the technology would realize new commercial opportunities as additional facilities would be built alongside existing in-situ facilities.
- Through commercial HDR deployment, the need for imported diluent would disappear and the available pipeline capacity for crude oil export would increase.
- Significant job creation opportunities would occur.
- Commercial project implementation is expected to increase to Alberta's GDP and royalties by billions of dollars.

15 Students Trained

40 Project Jobs

4350 Future Jobs

1 New Product/Service

2 Patents

Lifecycle GHG reduction will be realized in midstream and downstream

CURRENT STATUS

APR 2021

The HDR stage 1 demo was successfully completed and all technical KPIs were achieved. However, additional activities are required for commercial-ready status. The scope and cost estimate for the modification of the existing 500 bpd demonstration has been prepared. The scope includes the design, engineering, permitting, fabrication, installation, and maintenance required to bring the plant to a fully operational state. Success will be measured by equipment installation, safe start-up, meeting budget, and operation.