

CLEAN RESOURCES

ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTS – PARTIAL UPGRADING

FUNDING DETAILS

Advancing Bitumen Partial Upgrading Technologies Based on Thermal Cracking and Solvent Deasphalting - Operation & Process Configuration Optimization Project

Suncor is advancing the development of innovative partial upgrading technologies to reduce diluent requirements for bitumen transportation and to increase bitumen product value. This project involves the operation of a 5 bpd (bitumen basis - barrels per day) continuous partial upgrading pilot plant for various feedstock and deployment scenarios. The objective is to continue optimizing equipment design, operating conditions and configurations to achieve maximum product yield and value-add for deployment pathways. The technology, if successful, has the potential to improve market access for Alberta bitumen products, add value to bitumen and reduce life cycle GHG emissions and production costs.



RECIPIENT:
Suncor Energy Inc.



PARTNERS:
N/A



TOTAL BUDGET:
\$4,200,000



AI FUNDING:
\$1,500,000



PROJECT DATES:
JUN 2020 -
APR 2021



PROJECT TRL:
Start: 5
End: 6

APPLICATION

Bench and pilot scale test work has been conducted at various test locations. These early tests were conducted to support initial deployment opportunities and business case assessments. In many cases however, optimization in a fully integrated test system mimicking commercial operation has not been conducted. This application was specifically designed to address identified shortcomings of current technologies under development. It involves the modification on the existing pilot facility to enable multiple configurations to be evaluated.

ALBERTA INNOVATES CLEAN RESOURCES

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PROJECT GOALS

This project aims to optimize equipment design, operating conditions and process configurations to optimize returns for commercial deployment pathways. The objective of the phase of work being undertaken as part of this proposal is to evaluate product quality and overall yield for the technologies in different process configurations and to determine the conditions required for optimal performance. At the conclusion of this project, the technology will be tested as part of a larger field demonstration. Depending on completion of this program on time and market situation at that time, demo phase is anticipated starting in Q2 2021 and scheduled in range of 2-3 years. Preparations for commercial scale-up can begin in the middle of the demo phase.

BENEFITS TO ALBERTA

Suncor envisions the creation of a new Alberta bitumen product through the commercial deployment of this Partial Upgrading technology. This technology aims to improve the quality of bitumen by processing it to the point where it can meet pipeline specifications thereby eliminating the need for diluents for transportation via pipeline. Partial upgrading has the potential to add value to bitumen products and reduce the overall GHG emissions, CAPEX and OPEX for bitumen conversion (compared to full upgrading). A reduction in GHG emissions will be achieved through elimination of unnecessary utilities, minimizing the amount of energy input and maximizing heat integration. The process also targets no process water or steam, eliminating the need and costs for a steam plant, sour water stripping, and water treatment.



0-1 Publications



1-2 Students
Trained



0-1 Patents



2-3 Project Jobs



100's Future Jobs



1-2 New
Products/Services



0-1 Spinoff
Companies



N/A kT/yr Project
GHGs Reduced



15-20 CO2e/bbl
Future Reduced

CURRENT STATUS

JUN 2021

Project is completed with 13 pilot test runs performed, above the contracted amount. Project goals have been met and results are being used to inform the next stage of development, the demonstration phase.