ALBERTA INNOVATES

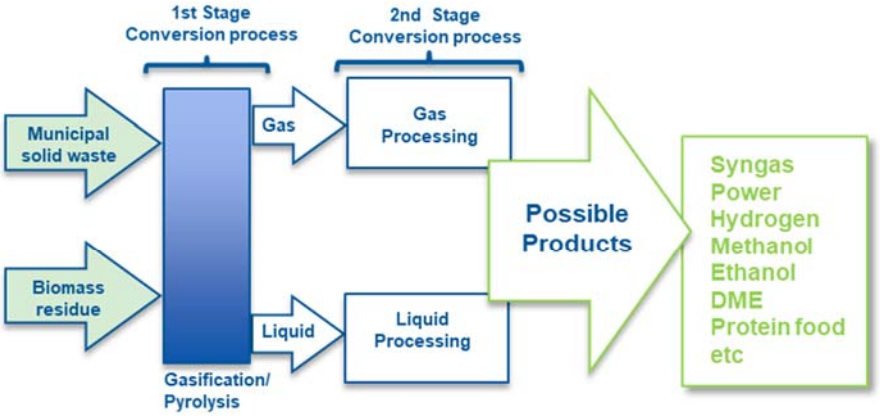
CLEAN RESOURCES

CLEAN TECHNOLOGY

BIOENERY – RENEWABLE FUELS

Alberta-based Biorefinery

National emissions reduction mandates, including Canada's Clean Fuel Standard, are driving increasing demand for low carbon fuels for energy and transportation, including low carbon biofuels. Through the Alberta Biorefinery project, Suncor aims to advance key technologies that will enable the use of sustainable Alberta feedstocks to produce low carbon fuels. These technologies include gasification and pyrolysis, which produce renewable products such as bio-gas (syngas), biocrudes, ethanol and biochars. By using various feedstocks and modifying the operating conditions of each technology, the differences in renewable product amounts and qualities will be studied and optimized. These results may enable the development of a Biorefinery in Alberta that utilizes feedstocks available within Alberta, supports local businesses, and reduces the carbon intensity (GHGs) of fuels used in Alberta and Canada.



Biorefinery - Schematic

FUNDING DETAILS

RECIPIENT:
Suncor Energy Inc.

PARTNERS:
City of Edmonton, Enerkem, University of Alberta

TOTAL BUDGET:
$16.2 Million

AI FUNDING:
$1,000,000

PROJECT DATES:
JUL 2020-
DEC 2024

PROJECT TRL:
Start: 5
End: 9

APPLICATION

This knowledge will benefit the energy sector of Alberta, including oil and gas companies (such as Suncor) that are interested in reducing their emissions and building their own renewable fuel production capabilities in Alberta. It will also be applicable to municipal waste and forestry companies that are looking for ways to reduce emissions from their operations (e.g. diversion of landfill gas and prevention of slash-burning forest residuals).

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PROJECT GOALS

- The goal of the Alberta Biorefinery project is to advance the knowledge of renewable product properties when produced from Alberta feedstocks through various technologies. Examples of Alberta feedstocks that may be utilized for testing include forest residuals mandated to be slash-burned; mill residues such as hog fuels, wood chips, and sawdust; and landfill waste (municipal and industrial).
- The feedstocks will be gasified or pyrolyzed, and the bio-gas, ethanol and biocrude produced from the processes will be compared to determine the optimal arrangement of technologies and feedstocks to produce high quality low carbon fuels.
- The final goal is to pilot a renewable fuel technology to advance the biorefinery concept in Alberta.

BENEFITS TO ALBERTA

- The Alberta Biorefinery project will specifically focus on the use of Alberta feedstocks, which is needed to inform the design and development of Biorefineries in Alberta and de-risk the technologies that are needed for them.
- The project will also utilize Alberta infrastructure and personnel, including the Advanced Energy Research Facility in Edmonton, students and research expertise from the University of Alberta, and the forestry expertise of local producers.
- Developing renewable fuel projects in Alberta leverages our deep knowledge of responsible energy development as well as our existing energy infrastructure, to provide a low carbon fuel to the market.

Publications

5 Students Trained

Patents

>25 Project Jobs

>1,000 Future Jobs

1 New Products/Services

<10 kt/yr Project GHGs Reduced

350-750 kt/yr Future GHGs Reduced

CURRENT STATUS

JULY 2021 – In Progress

A gasification syngas study with Alberta biomass feedstock was completed at the Advanced Energy Research Facility (AERF) in Edmonton in July 2021.