

Carbon Fibre Pilot Plant Feasibility Study

Exergy Solutions and Suncor Energy are investigating commercial asphaltene derived Carbon Fibre (CF) advanced manufacturing feasibility. The project is to complete a feasibility study that includes engineering a versatile CF pilot plant design and prepare a screening level commercial assessment to convert bitumen derived asphaltenes into general purpose and high-performance CF. The study will provide pilot facility and commercial capital, economic, and employment information to support ongoing technology development. Exergy will engineer the pilot design that is required to move the technology from TRL 4 to 6, while considering manufacturing scale up, construction and lab infrastructure needs.



RECIPIENT:
Exergy Solutions



PARTNERS:
Suncor, N-GEN



TOTAL BUDGET:
\$247,000



AI FUNDING:
\$75,000



PROJECT DATES:
FEB 2021 –
SEPT 2021



PROJECT TRL:
Start: 4
End: 4

APPLICATION

The feasibility study will be used to assess the construction of a pilot project that could lead to Canada's first pilot-scale CF manufacturing plant that uses Canadian, bitumen-based asphaltene precursor materials. If the pilot demonstrates technical and commercial viability by successfully manufacturing asphaltene-derived CF, full-scale commercial production could be feasible. The pilot will function as a CF product development and testing centre of excellence to prove specification CF can be produced.

ALBERTA INNOVATES CLEAN RESOURCES

ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTION – BITUMEN BEYOND COMBUSTION

PROJECT GOALS

The feasibility study goal is to determine the pilot plant design, capital and operating costs to inform the go-forward execution decision. It includes:

- defining the pilot size and objectives to meet investment requirements for a commercial facility;
- designing and engineering the CF feedstock pre-treatment process range for a variety of asphaltene feeds, c) designing and engineering the CF spinning, oxidization, and carbonization process;
- producing a Class III cost estimate and schedule for the pilot facility;
- producing a commercial facility Class V screening /scenario level cost estimate and schedule; and
- preparing additional funding applications for the pilot facility.

BENEFITS TO ALBERTA

Alberta's benefit by supporting the project is obtaining techno-economic information that could support an estimated \$10MM+ pilot plant and CF center of excellence that could employ many highly qualified and skilled science engineering and technology personnel. If specification grade CF can be produced by the pilot plant that demonstrates the asphaltene derived CF has equivalent performance to alternative feedstocks, significant investment could occur into asphaltene producing upgrading and CF manufacturing operations, and potentially lead to new value added CF consuming product industries. The CF pathway diverts asphaltenes away from becoming petroleum coke and being combusted in power stations and kilns, towards a non-combustion, value added consumer or building application. CF manufacture from bitumen derived asphaltenes could have GHG mitigation benefits.



**4 Sector HQP
Trained**



**1 Unique
Product/Process**



**1 End User
Participating**

**CURRENT
STATUS**

MAY 2021

Project launched in February 2021. Initial results are forthcoming.