ALBERTA INNOVATES

CLEAN ENERGY

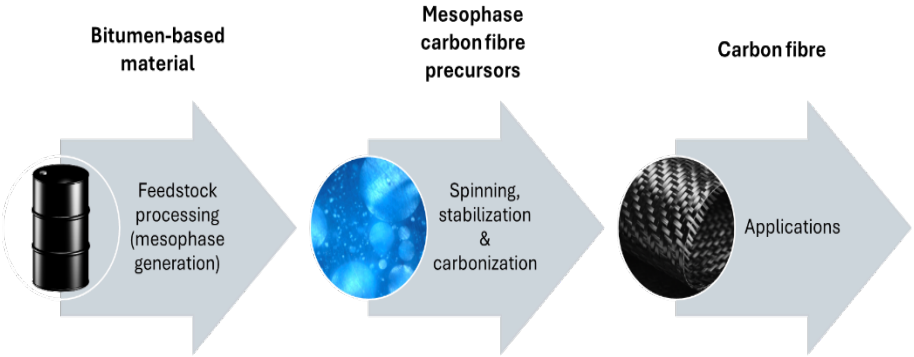
ADVANCED HYDROCARBONS

BITUMEN ADVANCED MATERIALS

FUNDING DETAILS

Generating Bitumen Derived Carbon Fibre Precursors

InnoTech Alberta has collaborated with Alberta Innovate's CFGC to develop carbon fibres (CF) from bitumen-derived feedstocks, focusing on asphaltenes. This project builds on prior research to refine CF production, creating 16 samples for testing at InnoTech Alberta and Deutsche Institute für Textil- und Faserforschung Denkendorf (DITF). The goal is to demonstrate the transformation of low-value bitumen into high-performance CF. Advancing this technology supports Alberta's economic diversification by positioning the province as a leader in CF production, opening new markets, and contributing to sustainable, high-value manufacturing.



RECIPIENT:
InnoTech Alberta

PARTNERS:
None

TOTAL BUDGET:
$672,800

AI FUNDING:
$672,800

PROJECT DATES:
MAR 2025 – DEC 2027

PROJECT TRL:
Start: 4
End: 7

APPLICATION

This project focuses on developing mesophase precursors from bitumen-derived feedstocks to produce cost-effective general-purpose carbon CF. By lowering production costs, these CFs can establish a niche in automotive and energy markets, offering new opportunities while replacing PAN-based fibers in select applications. The successful implementation of this technology could enhance the economic viability of CF production, expand its use in industrial applications, and contribute to the broader adoption of lightweight, high-performance materials.

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PROJECT GOALS

- Advance the processing of industrial bitumen-derived feedstocks into mesophase CF precursors, offering a cost-effective alternative to conventional CF production.
- Produce high-performance CF for diverse applications. Comprehensive testing at InnoTech will assess spinning, thermal processing, and mechanical properties.
- Meet or surpass the mechanical properties outlined in CFGC Phase 3, which would establish bitumen-derived CF as a viable and competitive alternative to conventional PAN-based fibres.
- Up to two top-performing feedstocks will be scaled for production and used in prototype development. Large-scale applications will undergo further testing, bridging the gap from bench-scale research to commercialization.

BENEFITS TO ALBERTA

- The project will push closer to commercialization an alternative high value use for Alberta's bitumen.
- Commercializing bitumen-derived CF would provide a cost-effective, high-value alternative to conventional PAN-based CF. By utilizing bitumen feedstocks, the initiative promises lower production costs, reduced carbon emissions, and enhanced resource efficiency.
- Successful commercialization would lead to job creation in R&D, manufacturing, and logistics sectors while developing a skilled workforce via partnerships with post-secondary institutions.
- Ultimately, it advances Alberta's position as a global leader in sustainable, high-tech materials manufacturing and a domestic supplier of highly sought after carbon fibre material.

1-2 Prototypes

2 New Products/Services

2 Patents

4 Sector HQP Trained

11-100 Future Jobs

10-100 kt/yr Future GHGs Reduced

CURRENT STATUS

JUN 2025

The InnoTech Alberta team is busy preparing mesophase CF precursor from bitumen-derived streams. The first two samples have been prepared and will be sent to DITF by mid-July. These samples have shown promising mesophase content and good spinnability, indicating progress toward a viable precursor formulation. Additional batches are currently being refined, with ongoing adjustments to thermal treatment conditions to improve fibre morphology and consistency.