ALBERTA INNOVATES

CLEAN ENERGY

ADVANCED HYDROCARBONS

CARBON FIBRE GRAND CHALLENGE PHASE III

FUNDING DETAILS

Pre-Commercial Production of Carbon Fibre and Carbon Fibre Products from Alberta Bitumen-Based Feedstock

Thread Innovations Inc. (“Thread”) is pursuing a pre-commercialization project to demonstrate scalability, fibre viability, and consistency of its proprietary, low-cost, and efficient process intellectual property (“IP”) for producing carbon fibre from Alberta bitumen-based feedstocks, including refinery residue (“Bitumen-Based Feedstock”).

THREAD

RECIPIENT:
Thread Innovations Inc.

PARTNERS:
None

TOTAL BUDGET:
$10,588,000

AI FUNDING:
$1,000,000

PROJECT DATES:
OCT 2023 – JUN 2026

PROJECT TRL:
Start: 8
End: 9

APPLICATION

Thread believes that cost-effective, environmentally conscious, and scalable supply of carbon fibre would promote the expansion of use in current carbon fibre applications and, as a substitute material, unlock new wide-ranging applications where strength-to-weight is critical. Examples that Thread has started exploring include light-weight parts for transportation (air & land), pressure vessels, and sporting goods.

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PROJECT GOALS

Project goals are to:

i) demonstrate scalability of Thread's IP through processing at least 300 kg of Bitumen-Based Feedstock into carbon fibre precursor in a single batch process;

ii) producing >40 kg of carbon fibre from precursor in a single day demonstration;

iii) improve tensile strength of produced carbon fibre to >2,000 MPa,

iv) validate production estimates of <$7.00 and <18 kgCO2e GHG emissions per kg of carbon fibre, and

v) develop two commercially viable output fibre or fibre-based products.

BENEFITS TO ALBERTA

Due to the abundance of Bitumen-Based Feedstock, the ultimate economic benefit to Alberta will be the driven by output fibre properties, the engineering of these fibres into current or new applications, and the resulting scale of demand.

Illustratively, a 10,000 MT/year carbon fibre production plant could generate as much as $150,000,000 in annualized revenue and employ 400 Albertans.

Long-term production expansion is virtually boundless. Alberta has the potential to become largest producer of carbon fibre globally with 100,000s of MT/year capacity using a production method that permanently sequesters carbon from combustion supply-chains for use in lighter-weight, stronger, more-durable, and energy efficient transportation and structural applications.

2+ New Products/Services

7+ Patents

8 Project Jobs

100-1000 Future Jobs

CURRENT STATUS

Jun 2025

Thread completed construction of a dedicated 10,000 square foot facility in Edmonton in H1-2025. In H2-2025, Thread commissioned stage 1 equipment to batch-process carbon fibre precursor from Bitumen-Based Feedstock and has since demonstrated over 15 successful operations. Building off precursor production success, Thread is currently focus on stage 2 operations to produce three fibre formats that will be further oxidized and carbonized, in stage 3 and 4 operations, respectively, later in 2026.