ALBERTA INNOVATES

CLEAN ENERGY

ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTS

FUNDING DETAILS

Development of Lower-Cost High-Value Carbon Fibres from Alberta Bitumen Derived Feeds

Bitumen derived carbon fibres provide a route to not only create low-cost high-performance fibres for clean tech, but reduce the carbon footprint of carbon fibre production. The project aims at the development of functional carbon fibre prototypes for applications such as electromagnetic shielding for battery cases, supercapacitors, and higher strength and stiffness multifilament yarns for structural composites. The research conducted in this phase of the project provides the important pathway of moving bitumen derived carbon fibre technologies from successful lab trials to technical market readiness on the pathway towards commercialization.

RECIPIENT:

UBC,

Dr. Yasmine Abdin

PARTNERS:

Total Containment, Fibernx Technologies Inc.

TOTAL BUDGET:

$5,430,000

AI FUNDING:

$2,600,000

PROJECT DATES:

JAN 2024 – DEC 2026

PROJECT TRL:

Start: 4

End: 7

APPLICATION

Functional applications such as supercapacitors, battery cases, EMI shielding and structural applications for automotive, sporting goods among others.

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PROJECT GOALS

The overarching objective of the current project is to develop low-cost, more sustainable, high-value bitumen-based carbon fibre materials and their successful use in composite applications in mass production sectors like automotive, pipelines, sporting goods, and others. This will, in turn, result in the diversification of bitumen by diverting its use from high carbon footprint combustion applications to high-value advanced manufacturing. If successful, it will result in the creation of new industries and revenue streams in Alberta and across Canada and will provide substantial opportunities for bitumen to contribute to solutions in a NetZero economy.

BENEFITS TO ALBERTA

The project encompasses substantial potential for economic benefits to Alberta by diversifying bitumen use into carbon fiber (CF) production, potentially adding $179 to the bitumen barrel's value. This shift could contribute $20 billion annually to GDP, attract new investments, and create jobs across various industries, including automotive manufacturing. The project aims to reduce greenhouse gas (GHG) emissions significantly by replacing steel with bitumen-based CF in vehicles. Additionally, CF application in battery packs could reduce electric vehicle weight by 30%, enhancing their appeal. While the CF industry may introduce some GHG emissions, the overall positive impact on emissions reduction is anticipated to outweigh the negatives, benefiting Alberta and potentially contributing to global emission reduction efforts.

12-15 Publications

2-4 Patents

5 Collaborators

3 New Products/Services

9-12 Students Trained

6-8 Sector HQSP Trained

CURRENT STATUS

JUN 2025

Advancements in the scale-up of carbon fiber production to multi-kg per hour have been demonstrated. Successful characterization of associated carbon fibres showed improvements to mechanical and functional properties. End user prototype development using different fibre types is underway. Project milestones are progressing on schedule.