

# CLEAN RESOURCES

## ADVANCED HYDROCARBONS

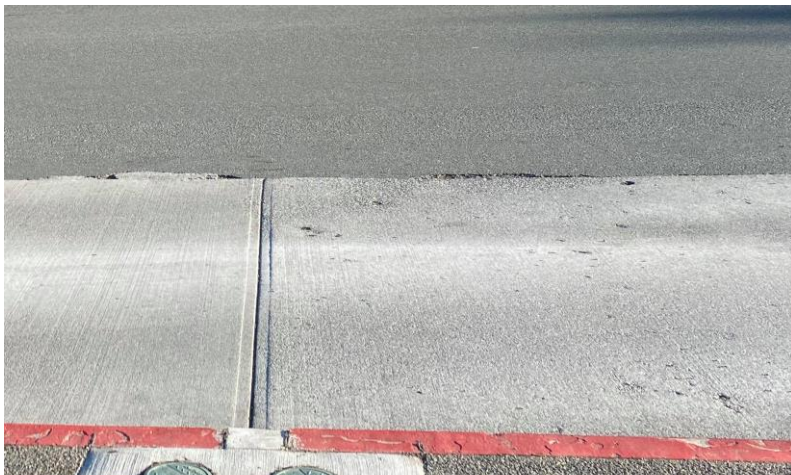
INNOVATIVE HYDROCARBON PRODUCTION – BITUMEN BEYOND COMBUSTION

### FUNDING DETAILS

## Development of Smart Sensing De-icing Surfaces Using Asphaltene-based Carbon Fibres

Deicing salt is widely used during winters to melt snow/ice off surfaces to keep them safe for public use. However, it is well known that the use of deicing salts is labor-intensive, causes premature deterioration of infrastructure (due to corrosion) and this is compounded by the destruction of the soil ecosystem underneath.

In this project, a new technology for de-icing pavements has been proposed called self-heating pavement systems (HPS). The project involves the development of a smart electrically conductive fiber reinforced concrete (SECFRC) with a capacity to get heated-up quickly and exhibit de-icing characteristics without any salt application.



**RECIPIENT:**  
University of  
Victoria



**TOTAL BUDGET:**  
\$240,700



**PROJECT DATES:**  
MARCH 2021 –  
MARCH 2023



**PARTNERS:**  
Butler Concrete  
and Aggregate Ltd.,  
VICON Enterprises  
Inc.



**AI FUNDING:**  
\$170,000



**PROJECT TRL:**  
Start: 3  
End: 5

## APPLICATION

The technology has a great potential to be used in areas that receive a large amount of snowfall and can be implemented on bridge decks, sidewalks, pedestrian crossings, state highways, drive-ways, airport pavements, etc.

# ALBERTA INNOVATES CLEAN RESOURCES

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### PROJECT GOALS

- To fully characterize asphaltene carbon fibres and determine their potential use in smart sensing concrete
- To induce the self-heating de-icing mechanism in the material itself
- To develop a smart material deterioration methodology
- To demonstrate value added uses of Alberta's natural resources

### BENEFITS TO ALBERTA

Alberta is continuously subjected to large amounts of the use of de-icing salts to deal with heavy snowfall and to maintain safe traffic on roads. This is adversely affecting both the infrastructure and the environment of the entire province. The proposed technology holds the potential to significantly reduce the quantum of de-icing salts used currently. In addition to improving the service life of infrastructure, and protecting the environment, the proposed technology can significantly reduce greenhouse gas (GHG) emissions. Furthermore, the proposed work intends to utilize asphaltene-based carbon fibres, produced from crude bitumen and can accelerate Alberta's economy.



1 Patents



1 New  
Product/Service



2 Students  
Trained



1 Collaborator

**CURRENT  
STATUS**

**APRIL 2021**

Project launched in April 2021. Initial results are forthcoming.