ALBERTA INNOVATES

CLEAN RESOURCES

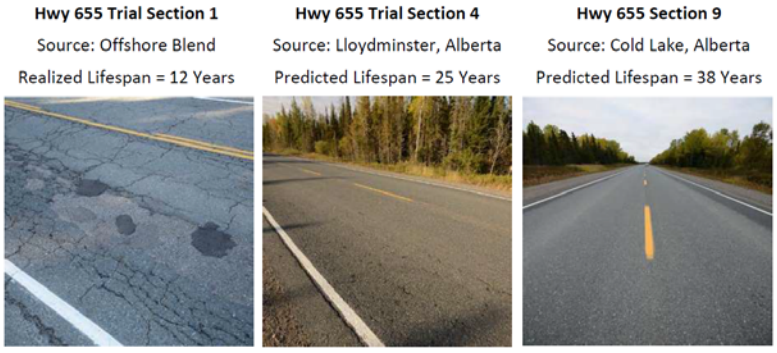
ADVANCED HYDROCARBONS

INNOVATIVE HYDROCARBON PRODUCTS – BITUMEN BEYOND COMBUSTION

Value-Added Opportunities for Alberta Asphalt Binder in Road Construction

Currently, simple purchase agreements control materials acceptance in road construction, and transportation agencies have to trust sellers that a quality product is offered. This leaves superior asphalt from Alberta at a disadvantage, as existing specifications are far from accurate and complete. The research will promote the benefits of quality Alberta binder. Asphalt materials from a number of large agencies will be assessed for true performance characteristics, and results benchmarked against superior Alberta asphalt binder properties. Interested agencies will be engaged for the construction of a large number of real world pavement demonstration projects during a subsequent phase of the program.

Superior Alberta Asphalt Binder Quality Drives Sustainability



FUNDING DETAILS

RECIPIENT:
Queen's University (Hesp)

PARTNERS:
Durham, NSERC, Imperial Oil

TOTAL BUDGET:
$1,169,400

AI FUNDING:
$650,000

PROJECT DATES:
MAR 2022 – MAR 2024

PROJECT TRL:
Start: 6
End: 7

APPLICATION

Road construction is the largest market for oil sands-derived products. European hot mix asphalt production has fluctuated around 300 million tonnes annually, while in the USA it is approximately 340 million tonnes. The global asphalt cement market is estimated at 87 million tonnes, with an annual growth of 5%. Assuming that Alberta can capture 10% of the market, this would mean an increase in market share of 15 million tonnes (about 300,000 bpd) by 2030.

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PROJECT GOALS

The key goals of the project will help make Alberta asphalt more competitive in international markets:

- Large user agencies will be educated on the benefit/cost efficiency of current specifications, as reflected by the performance of materials placed in their road construction. Data will be reported back to participants to contrast what they receive now with what can be obtained from quality Alberta binder.
- Engaged agencies will be encouraged to adopt enhanced specifications that would provide Alberta binder with a well-deserved competitive advantage.
- A final goal of the research will be to convince agencies to commission a number of real-world demonstration projects to validate the proposed changes to their acceptance specifications. Once constructed such trials would provide conclusive findings in a 5–10-year period.

BENEFITS TO ALBERTA

Once enough agencies are educated and convinced of the benefits of enhanced acceptance specifications, the use of Alberta asphalt will become more desirable and market share will increase. It is hoped and anticipated that, with the right incentives, users will agree to the construction of pavement demonstration projects. Results of such trials would become available within 5-10 years, positively impacting Alberta's oil sands within a 10–15-year timeframe. In a world where lighter crudes will soon be phased down and perhaps even largely eliminated, the transition to electric vehicles will not reduce the need for smooth and safe asphalt pavement. There will be a continuing demand for bitumen from Alberta, as lighter crude simply will not be able to meet demand in decades to come.

10 Publications

1 New Practice Informed

10-100 kt/yr Future GHGs Reduced

CURRENT STATUS

AUG 2022

Research has started in March 2022. Asphalt samples have been obtained from road construction contracts in four Canadian and seven US jurisdictions, with additional samples committed by a further eight US and one Chinese jurisdiction. Progress is being made on the development of accurate and practical grading tests for extracted and recovered asphalt binder and mixtures that can be completed within 24 hours of sampling. Several publications on the findings are currently in preparation.