ALBERTA INNOVATES

CLEAN ENERGY

ADVANCED HYDROCARBONS

BITUMEN ADVANCED MATERIALS

Construction of 300 T/year Commercial Demonstration ASAC Plant

AdvEn has developed a proprietary recipe and manufacturing process to produce high performance activated carbon, trademarked “ASAC” (AdvEn Super Activated Carbon), from refinery residues and asphaltenes generated in bitumen partial upgrading. It utilizes Alberta’s rich bitumen resources as an excellent carbon precursor to manufacture clean-tech products beyond combustion. Compared to its worldwide peers, ASAC has industry-leading performance metrics coupled with cost competitiveness. It has many applications, one immediate example of which is to build energy storage devices.

In the current project, AdvEn will expand an existing pilot plant to a commercial demonstration plant with a capacity of 300 tons/year.

RECIPIENT:

AdvEn

PARTNERS:

NRC IRAP Clean Technology Program

TOTAL BUDGET:

$13,791,335

AI FUNDING:

$3,425,000

PROJECT DATES:

MAY 2020 – DEC 2025

PROJECT TRL:

Start: 8

End: 9

APPLICATION

ASAC will provide a material technology platform that enables numerous proven or emerging downstream products for industrial and consumer uses. For example, similar products have been or can be made as an integral gradient in building energy storage devices such as batteries and supercapacitors, filtration for agriculture, biochemical, pharmaceutical, and medical applications, gas storage including hydrogen, CO2 capture, cosmetics. **ASAC enables future innovation across a wide range of industrial applications, with opportunities for both established manufacturers and emerging players.**

ALBERTA INNOVATES

CLEAN ENERGY

ADVANCED HYDROCARBONS

BITUMEN ADVANCED MATERIALS

PROJECT GOALS

The overall goals are:

- to overcome the remaining technical challenges related to the ASAC production process; and
- de-risk the scale-up of that process prior to full commercial production. For examples, it will demonstrate consistent production quality from a scaled-up facility – 300 tons/year. This is a key prerequisite for customer validation and offtake agreements. It will also optimize the manufacturing process, enabling more cost-efficient operations.

BENEFITS TO ALBERTA

AdvEn's ASAC technology will greatly contribute to the clean resource initiative being pursued by Alberta government. Some examples are listed below:

- Repurpose hydrocarbons/bitumen away from the usual combustion consumption eliminating associated downstream GHG emissions;
- Convert hydrocarbon residues into superior performing advanced materials for the energy storage industry facilitating its broader adoption and greater utilization (batteries and supercapacitors);
- ASAC production generates greatly reduced indirect GHG emission. Its total energy consumption is 1/10th of the current commercial processes and its total GHG emission is 1/3;
- ASAC uses lower production temperatures and eliminate hazardous chemicals (e.g., strong acids/bases) that are typically used in other AC manufacturing processes.

3 Publications

3 Patents

30 Sector HQSP Trained

1 Field Pilot / Demonstration Product/Service

11-100 Future Jobs

6 New Products / Services

CURRENT STATUS

JUN 2025

AdvEn has completed commissioning of its 300-ton/year commercial demonstration plant and is currently optimizing the ASAC production process to ensure consistent product quality across batches. Two successful purchase orders were delivered in April 2025, and customer validation trials are now underway. PA Consulting Ltd., a globally recognized UK-based consulting firm, has been engaged to support process optimization and lead the planning for expansion to an 800-ton/year commercial facility.

Disclaimer • Alberta Innovates (AI) and His Majesty the King in right of Alberta make no warranty, express or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information contained in this publication, nor that use thereof infringe on privately owned rights. The views and opinions of the author expressed herein do not necessarily reflect those of AI or His Majesty the King in right of Alberta. The directors, officers, employees, agents and consultants of AI and the Government of Alberta are exempted, excluded and absolved from all liability for damage or injury, howsoever caused, to any person in connection with or arising out of the use by that person for any purpose of this publication or its contents.