

CLEAN RESOURCES

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RENEWABLE & ALTERNATIVE ENERGY – ELECTRICITY GENERATION

Alberta's Industrial Heartland Association (AIHA) Small Modular Nuclear Reactor (SMnR) Best Fit Study

Alberta's Industrial Heartland (AIH) is Canada's largest hydrocarbon processing centre. With over \$40 billion worth of heavy industrial assets on the ground and a further \$30 billion expected in the next 10 years, Small Modular Nuclear Reactors (SMnR) offer a potential solution in providing a zero-emission power and steam at scale. This opportunity supports decarbonization which is a key priority for the industrial players that are present in AIH today and those who are assessing future investments in the region. AIHA, with support from Alberta Innovates and Prairies Economic Development Canada (PrairiesCan), has commissioned Fluor Canada Ltd. to undertake a study to determine if SMnRs are a viable and economic solution in the near future.

Oil sands Remote communities and · Steam for SAGD and mines electricity for upgrading at 96 facilities Canada with energy needs > 1 210 MWe average size MWe for both heat and power SMRs replacing costly diesel and demands heating oil could reduce energy 5% replacement by **DE** costs to the territorial 2040 could provide \$350-450M in value · The high cost of energy from diesel is a barrier. SMRs could facilitate and enable new mining · 24 current and potential off-grid High-temperature steam for heavy industry 85 heavy industry locations Replacing conventional coal-(e.g. chemicals, petroleum Refining) fired power: 25-50 MWe average size nits in Canada at 17 facilities 5% replacement by SMRS 343 MWe average size between 2030 and 2040 could provide \$46M in 10% replacement by SMRs between 2030 and 2040 could value annually provide \$469M in value

Source: A Call to Action: A Canadian Roadmap for Small Modular Reactors

FUNDING DETAILS





RECIPIENT:
Fluor Canada Ltd.

PARTNERS: AIHA PrairiesCan





TOTAL BUDGET:

\$76,755

AI FUNDING: \$19,627





PROJECT DATES:

SEP 2022 -

DEC 2022

PROJECT TRL: N/A

APPLICATION

SMnRs have potential to play a role in supplying reliable, zero emissions power and steam to industry. Identifying the current and future constituents, Fluor will be developing eleven unique use cases for deploying SMnRs in the defined region, known as Alberta's Industrial Heartland. Through the assessment, Fluor will be providing the base analysis on how SMnRs could be deployed feasibly in the jurisdiction and which types of technologies are best fit.

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PROJECT GOALS

- Characterize the unique power and steam requirements of heavy industrial applications in the AIH.
- Identify known SMnR technologies that would be able to fill the requirements for inputs and determine best fit.
- Evaluate the economics of applying an SMnR solution vs. traditional renewables to achieve similar emission reduction targets.
- Identify opportunities for district application of SMnRs in the industrial area.

BENEFITS TO ALBERTA

- Supports a pathway towards decarbonizing heavy industry in Alberta.
- Access to clean energy will be a valuable asset to attract future investments into the province.
- Potential to support and leverage Canada's SMnR market.
- Helps to reduce risk of electricity shortages, extreme price fluctuations and power outages, and associated social impacts on Albertans, and economic impacts on industry.

CURRENT STATUS

APR 2023

The study is complete. The project Executive Summary is available in the <u>Clean Resources Project Library</u>.