

# Indigenomics: Combating Energy Poverty in Indigenous Communities with SMRs

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## **Problem Statement:**

How can the Canadian government leverage new small modular reactor technology to address energy poverty in remote, indigenous communities in Ontario?

# What is a Small Modular Reactor (SMR)



Small Modular Reactors:

Use nuclear fission to produce low-carbon energy, and are smaller than traditional reactors.

Benefits of SMRs include;

- Clean, carbon-free energy source
- Small nuclear generator capable of generating 300 megawatts = 300k homes
- Ability to be built at one location and transported to another
- Can be housed on land not suitable for larger plants
- Allow for controlled and reliable increases in output
- Can be applied in several energy contexts

# Background

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25

Remote communities in Ontario, account for 17% of the total remote population and 10% of remote diesel consumption.

6,360

Litres of diesel each year consumed by the average household for heat and electricity. Burning diesel has negative health and environmental impacts.

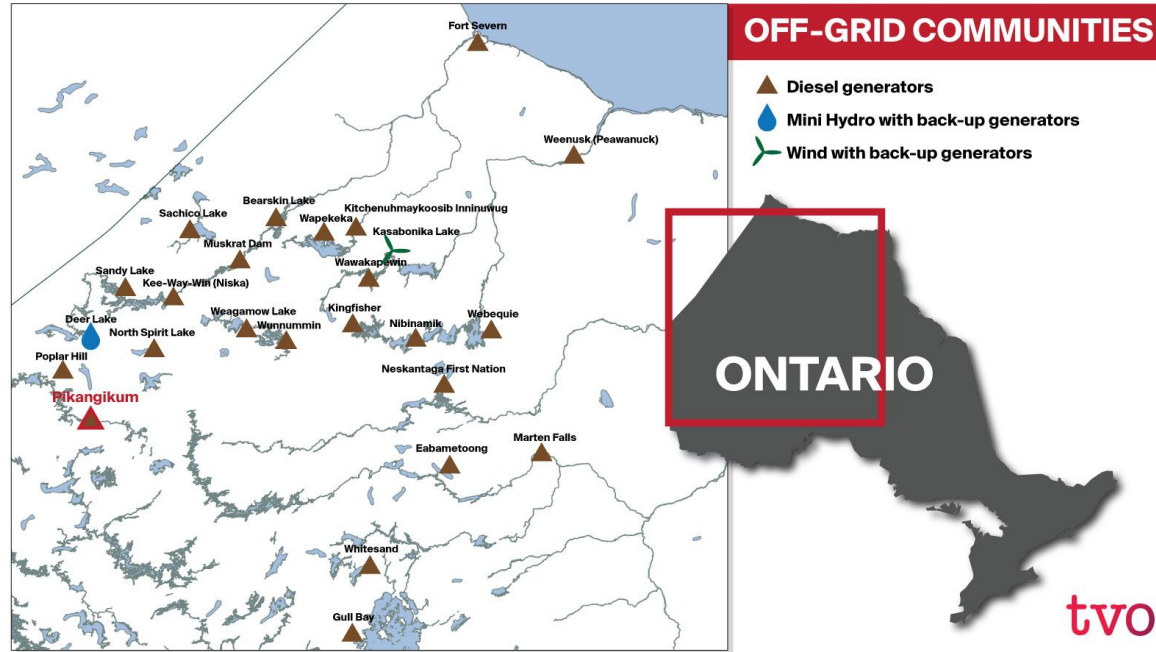
100,000,000

The total yearly cost of diesel-general electricity in Ontario's northernmost communities. 56% paid by federal government and 35% paid by Ontario electricity consumers by tax raising

42,000

Households living in energy poverty

# Map of Indigenous Communities Burning Diesel



<https://www.tvo.org/article/how-energy-poverty-devastates-pikangikum-first-nation>

# Current Government Action and Commitments

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- The Canadian Small Modular Reactor (SMR) Roadmap Steering Committee identified SMR as a source of low-cost electricity generation and safe and clean energy, an opportunity to provide low-carbon heat and power for industry and offset diesel use in remote communities and mine sites.
- In 2016, Ontario Power Generation (OPG) began to refurbish the Darlington reactors
- In 2019, Ontario, New Brunswick and Saskatchewan signed a Memorandum of Understanding (MOU) that establishes a framework for SMR development and deployment in each jurisdiction, joined by Alberta in 2021.
- The federal government is working towards UN sustainable development goal #7 which calls for universal access to affordable, reliable, sustainable and clean energy for all, and is targeting 90% sustainable energy production by 2030.

# Policy Options

1

**Continue the use of diesel-based energy + further research and campaign**

2

**Partner with Mining Companies**

3

**Pilot SMR projects in few communities**

# **Policy Option 1: Continue the use of diesel-based energy and expand research/engagement and raise public awareness of SMR**

- Public campaign to spread knowledge and information of SMR
- Conduct jurisdictional scan to learn about the effectiveness of SMR in other countries
- Collaborate with research institutions and scientists to develop safe and sustainable way of SMR transition

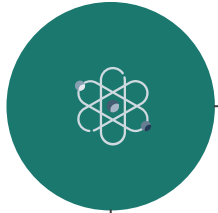


# Policy Option 2: Partner with Mining Companies

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- Mining companies will first implement and develop SMR technologies in their small remote mining sites before implemented in remote communities
- SMR technology is already being heavily invested in by mining companies
- Natural Resources Canada has already advised that mining companies pioneer the tech
- Mining companies will develop the technology until it ready to be implemented in remote communities
- Establish engagement between mining companies and indigenous communities

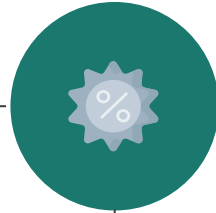
# Benefits



Provide  
energy  
security for  
remote  
communities



60%  
Cheaper  
than diesel



Reduced GHG  
Emission in  
Mining 25%



Job  
Creation

# Risks

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01

SMRs can be used in mining operations that are harmful to environment

02

Low regulatory Readiness

03

Predicted timeline of 7-9 years to implementation in Indigenous communities

04

Nuclear Waste Management

05

Might be seen as propping up the mining industry

## **Policy Option 3: Pilot SMR projects in remote, Indigenous communities**

- Work with indigenous leaders to design engagement mechanism to identify two to three remote communities who want to participate in a pilot program
- Implement SMRs in identified communities
- Utilize pilot and ongoing research to build public trust
  - Track and report outcomes for 5 years
- If successful, large scale implementation after 5 years

# Decision Matrix

	Policy 1	Policy 2	Policy 3
Economics and finance	✓	—	—
Technological readiness & feasibility	✓	✓	✓
Environmental impact	✗	—	✓
Social license	✗	—	✓



**Thank you**

# Appendix

	Policy 1	Policy 2	Policy 3
Economics and finance	Continuation of current investment and expense	Addresses cost of energy in some remote communities, but not at large scale	Improves the competitiveness of Canada's mining industry
Technological readiness & feasibility	Continuation of current technology + additional research in SMR		NRCAN has already identified 24 potential pilot sites
Environmental impact	Will not contribute to Canada's green energy goal and climate action plan	Will contribute to Canada's green energy goals but may delay progress beyond 2030	Reduces the environmental impact of mining
Social license	Growing frustration; continuous, negative impacts of climate change	Addresses social license concerns by targeting willing communities and building trust	Addresses social license concerns through proof of concept and opportunity for ongoing research. Aligns with Canada's commitments under TRC's recommendations and UNDRIP

# Stakeholder Mapping

