Highlights from the Canadian Small Modular Reactor Roadmap

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A Call to Action: A Canadian Roadmap for Small Modular Reactors (SMRs)

www.smrroadmap.ca
Highlight #1: Three distinct markets for Small Modular Reactors (SMRs) globally

- **On-grid power** (150 to 300 MWe)
- **On- and off-grid heavy industry** (10 to 80 MWe)
- **Off-grid communities** (1 to 10 MWe)
Highlight #2: SMRs can be competitive in all three markets

“Best case” levelized cost of electricity from on-grid SMRs:
Highlight #2: SMRs can be competitive in all three markets

“Worst case” levelized cost of electricity from on-grid SMRs:
Highlight #2: SMRs can be competitive in all three markets

Cost advantage of SMRs over diesel at off-grid mine sites and communities:

- **Cost increase** compared to diesel
- **Cost reduction** compared to diesel

**Showed for 6 and 9 percent discount rates (DR)**
Highlight #3: SMRs have significant market potential in Canada and globally

**Oil sands**
- Steam for SAGD and electricity for upgrading at 96 facilities
- 210 MWe average size for both heat and power demands
- 5% replacement by SMRs between 2030 and 2040 could provide **$350-450M** in value annually

**High-temperature steam for heavy industry**
- 85 heavy industry locations (e.g. chemicals, petroleum Refining)
- 25-50 MWe average size
- 5% replacement by SMRs between 2030 and 2040 could provide **$46M** in value annually

**Remote communities and mines**
- 79 remote communities in Canada with energy needs > 1 MWe
- SMRs replacing costly diesel and heating oil could **reduce energy costs to the territorial government**
- The high cost of energy from diesel is a barrier. SMRs could facilitate and enable new mining developments
- 24 current and potential off-grid mines

**Replacing conventional coal-fired power:**
- 29 units in Canada at 17 facilities
- 343 MWe average size
- 10% replacement by SMRs between 2030 and 2040 could provide **$469M** in value annually

**Bottom line:** SMRs could conservatively yield **$5.3B in total value** between 2030 and 2040.
Highlight #3: SMRs have significant market potential in Canada and globally

- **Replace coal-fired power generation**
  - SMRs can further transition the power sector away from coal
  - Even in a 2-degree scenario IEA projects 1100GWe
  - Potential market over $100B/year

- **Remote island nations and off-grid communities**
  - Large potential in over 70k communities
  - $30B/year market

- **Heat & power for mines**
  - SMRs powering of new mines between now and 2040 could yield total global value of $3.5B/year market

- **Steam for heavy industry**
  - Potentially $12B per year global market. Joint project from Idaho NL and NREL identified 850 facilities where SMRs could provide steam for US heavy industry.

**Bottom Line:** Estimated global value of $150B per year by 2040.
Investment risks

• Technology
• Regulatory
• Social

• SMR business model:
  1. Partnerships
  2. Marshalling investments
  3. Fleet approach and “order book”
Learn more about Canada’s SMR advantage

Full report available at:
www.smrroadmap.ca

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