



Keeping the "Know" in Nova Scotia:

The facts about nuclear energy in Nova Scotia

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The facts about nuclear energy in N.S.

Until recently, Nova Scotia had a moratorium on the exploration and mining of uranium starting in 1981. A full, legal ban on these activities was put in place in 2009 under Premier Darrel Dexter due to large scale community opposition across the province (Baxter, 2025). Investing in nuclear energy was specifically banned in legislation that saw the transfer of ownership from Nova Scotia Light and Power to Nova Scotia Power in the Nova Scotia Power Privatization Act of 1992 (Henderson, 2024). Despite large public resistance to nuclear energy generation and uranium mining, the moratorium on nuclear energy in Nova Scotia was lifted as part of the Energy Reform Act 2024 (Energy Generation) and the exploration and mining of uranium made possible again through An Act Respecting Agriculture, Energy and Natural Resources (2025).

As of May 2025, specific municipalities discovered that their communities had been selected for potential uranium exploration without prior notice or consultation (Willick, 2025). Although fracking and uranium extraction were not mentioned in the fall 2024 election campaign of the Progressive Conservatives (Hoffman, 2025), a concerted nuclear industry lobbying effort has proved effective in shifting government policy. Additional attempts to drive investment in the industry by building nuclear generating stations in Nova Scotia could follow.

Provincial governments, including Ontario and New Brunswick, are pushing nuclear energy as a critical source of energy.



The facts about nuclear energy in N.S. (continued)

Lobbyists for the nuclear industry and other proponents often claim that nuclear energy is clean and renewable, with some arguing that it is possible to avoid the soaring costs associated with traditional Candu (CANada Deuterium Uranium) reactors by constructing small modular reactors (SMRs). Although the commercial viability of this technology is uncertain, proponents claim these plants are a more efficient, non-polluting, "faster, safer, and cheaper form of nuclear energy generation" (U.S. Department of Energy, 2025).

However, evidence shows that SMRs are a resource intensive, expensive method of electricity generation and continue to embody the fundamental flaws associated with nuclear power. It is better to invest in and develop sustainable, cheaper and reliable alternatives such as renewables, battery storage and transmission lines for Canada's energy grid.

The timeline and cost of nuclear energy

It can take decades to develop a uranium mine and decades longer to approve and construct a nuclear energy facility. These timelines underscore a reality often ignored by nuclear proponents: pursuing uranium mining and nuclear energy in Nova Scotia cannot serve as an immediate response to American tariff threats, climate change or energy security.



The timeline and cost of nuclear energy (continued)

Nuclear energy generation is expensive; the Point Lepreau nuclear power generation station (in New Brunswick) serves as an example. It has cost three times more than the original estimate, with a cost to taxpayers of \$35 million (Harvey 2024). Renewable sources of energy, by contrast, are cheaper; the least expensive form of energy generation in Nova Scotia is wind power.

Health risks

Nuclear power is considered to emit less carbon compared to burning fossil fuels, but nuclear power is neither renewable nor waste-free. Uranium, the source of nuclear power, is a finite resource that produces radioactive waste, which remains potentially harmful for thousands of years.

There is still no safe, long-term solution for storing used uranium, so nuclear power puts the burden of health and environmental risks on future generations — similar to oil and coal use.

According to the Canadian Nuclear Safety Commission (CNSC) (2021) Canada currently has:

• 218 million tonnes of uranium mill tailings (water that has been exposed to radiation when mining uranium)



Health risks (continued)

- 167 million tonnes of uranium waste rock (rocks that surround uranium deposits or mines and that have been exposed to radiation)
- 2.5 million fuel bundles (used uranium fuel source). If stacked end-to-end, these fuel bundles could fill seven hockey rinks from the floor to the top of the boards.

Uranium and radon are highly radioactive materials and cause multiple health impacts, including cancer (CNSC, 2021). As recently as 2024, a nuclear lab in Chalk River, Ontario had a nuclear waste spillage into the Ottawa River, harming the wildlife in an area crucial to Indigenous communities. Environment Canada failed to notify the public (Forrester, 2024).

Uranium and radon are a naturally occurring health risk in Nova Scotia. However, this risk is increased when uranium ore is brought to the surface through exploration or mining, and through the management of nuclear facilities.

Small modular reactors

Corporations, governments and industry continuously look for 'super technology" in an attempt to find the catch-all industrial solution to energy that does not change the status quo of constant growth and extraction.



The main arguments for small modular reactors (SMRs) are that they are "low-waste", "a reliable, fast-acting fuel generation" and "cheaper" than traditional large scale nuclear (U.S. Department of Energy, 2025). However, SMRs are an experimental and emergent technology which takes decades to make and is wasteful, more radioactive and incredibly cost intensive. Additionally, overreliance on this catch-all technology prevents resources from going towards cleaner and more efficient projects such as renewables, battery storage and transmission line expansion.

Energy production of SMRs

SMRs create a lot of waste and have relatively low energy output. SMRs can produce only half the energy of a traditional reactor. A study conducted at Stanford University suggests that SMRs produce waste with at least nine times more neutron leakage, which causes a spike in radio activity (Shwartz, 2022). The increase in radio activity could put workers and residents near these facilities at higher risk of uranium and radon related health risks such as lung cancer (Lane et al., 2010).

Projects delays and long timelines further limit the productivity of SMRs. The New Brunswick government has spent close to 30 million in funding for the proposed 100-megawatt ARC SMR (Poitras, 2024).



Energy production of SMRs (continued)

The project was proposed to help meet 2030 climate goals, but due to delays it will not meet the 2030 deadline and may not be completed by 2035 (Poitras, 2024). This SMR is expected to be 21 stories, close to the largest existing structures in the province, and extend 35 meters above ground and 38 meters below ground (Edwards, 2024). Clearly, large scale development is still required for a less efficient energy source.

The cost of SMRs

SMRs are expensive and economically volatile, susceptible to U.S. tariffs. Uranium in general is vulnerable to U.S. tariffs because the U.S. is the largest purchaser of uranium globally (Lornic, 2025). The financial uncertainty caused by the ever-changing tariffs has drastically slowed the purchase of Canadian uranium (Lornic, 2025).

The fuel used by some SMRs is not produced in Canada. For example, a proposed SMR in Ontario requires enriched uranium fuel, something Canada does not produce. Building projects that require Canada to <u>import</u> uranium fuel would weaken Canada's energy independence from the U.S. (Beer, 2025).

Furthermore, regardless of the fuel source, SMRs are extremely costly to develop. The project in Ontario is expected to take a decade to complete and cost close to \$27 billion.



The cost of SMRs (continued)

The Ontario Clean Air Alliance (2025) noted that "...these new nuclear reactors will cost up to 8 times more than power from onshore wind turbines; almost 6 times more than power from solar farms; and up to 2.7 times more than Great Lakes offshore wind power."

SMRs are extremely costly to build everywhere: in France, the Flamanville 3 project is expected to cost \$15 billion with a 16year timeline (Ramana, 2024); in Utah, the NuScale SMR project is expected to go over \$9 billion in costs. Institute for Energy Economics and Financial Analysis (2024) notes that because SMRs are so slow and expensive, this technology is too risky to rely on to meet decarbonization goals in the next decade.

Attempts to speed up the development process demonstrate a lack of consideration for community interests and environmental costs. For example, Arizona is looking forgo environmental assessments in order to push through SMRs close to industrial settings in rural areas. This plan would also undermine existing local zoning regulations (Martucci, 2025). Bypassing parts of the regulatory process and ignoring community stakeholders in the name of extraction and financial gain is not how industrial projects proceed safely.

Once projects are operational, nuclear power generation is still expensive, expected to cost \$141 and \$221 per megawatt hour (Ramana, 2024).



In contrast, wind, solar and battery storage projects are proven technology that can be built on a shorter timeline and be as cheap as \$12 to \$31 USD per megawatt-hour (Ramana, 2024).

Renewable energy is cleaner, faster to develop and will help meet climate goals, while also having local economic benefits. Studies show investments in Nova Scotia's green economy could create15,000 new jobs annually and contribute over \$810 million to the province's GDP (Ecology Action Centre, 2019).

Recommendations

Even with the rise of technology such as SMRs, uranium mining and nuclear energy production is dirty and impractical when considering the time and costs associated with development. In Nova Scotia, reinstating the bans on uranium exploration and nuclear energy generation would have larger environmental benefits and community support. There are faster, cheaper, lower-waste and renewable energies available in Nova Scotia, such as offshore wind, that could be added to the energy grid. Increasing and improving transmission lines, renewable energy and battery storage development would provide cleaner, cheaper and more reliable energy, increasing jobs in the sector and regional economic growth.



References

- Baxter, J. (March 2025) Uranium exploration and mining in Nova Scotia

 the radioactive issue that Houston's government reactivated. Halifax Examiner. <u>halifaxexaminer.ca/dismantling-democracy/uranium-exploration-and-mining-in-nova-scotia-the-radioactive-issue-that-houstons-government-reactivated/</u>
- Beer, M. (2025) Critics Slam Cost of Ontario SMR Plan, Question Dependence on U.S. Uranium. The Energy Mix. <u>theenergymix.com/critics-slam-cost-of-ontario-smr-plan-question-dependence-on-u-s-uranium/</u>
- Bill No. 6, An Act Respecting Agriculture, Energy and Natural Resources, 1st session, 65th General Assembly, Nova Scotia 2025. <u>nslegislature.ca/legc/bills/65th_1st/1st_read/b006.htm</u>
- Bill No. 404. Energy Reform Act. 1st Session, 64th General Assembly, Nova Scotia 2024 <u>nslegislature.ca/sites/default/files/legc/PDFs/annual%20statutes/2024%</u> <u>20Spring/c002.pdf</u>
- Nova Scotia Power Privatization Act.
 <u>nslegislature.ca/sites/default/files/legc/statutes/nova%20scotia%20po</u>
 <u>wer%20privatization.pdf</u>
- Canadian Nuclear Safety Commission. (May 2021). High-level radioactive waste. Government of Canada. <u>cnsc-</u> <u>ccsn.gc.ca/eng/waste/high-level-waste/</u>
- Ecology Action Centre (2019). Nova Scotia Environmental Goals and Sustainable Prosperity Act: Economic Costs and Benefits for Proposed Goals: <u>ecologyaction.ca/sites/default/files/2022-</u> 06/EAC GP Climate%20Jobs%20Report Sept2019 0.pdf



References (continued)

- Edwards, G. (Nov. 2024). Will New Brunswick choose a 'small, modular' nuclear reactor that's not small at all (among other problems)? Coop Media NB. <u>nbmediacoop.org/2024/11/23/will-new-brunswick-choosea-small-modular-nuclear-reactor-thats-not-small-at-all-among-otherproblems/</u>
- Forrester, B. (May 2024) Toxic sewage discharged at Chalk River nuclear lab. CBCNews. <u>cbc.ca/news/indigenous/toxic-sewage-chalk-</u> <u>river-nuclear-1.7191733</u>
- Harvey, J. (July 2024) New Brunswick's nuclear-powered rate hikes. NB Media Coop. <u>nbmediacoop.org/2024/07/08/new-brunswicks-nuclear-powered-rate-hikes/</u>
- Henderson, J. (March 2024). Keep the ban on nuclear power in Nova Scotia, environmental groups say. Halifax Examiner. <u>halifaxexaminer.ca/economy/energy/keep-the-ban-on-nuclear-</u> <u>power-in-nova-scotia-environmental-groups-say/</u>
- Hoffman, J. (June 2025) Hants County residents voice concerns over 'undesirable' uranium mining proposal. CBCNews <u>cbc.ca/news/canada/nova-scotia/hants-county-residents-voice-</u> <u>concerns-over-undesirable-uranium-mining-proposal-1.7549483</u>
- Institute for Energy Economics and Financial Analysis (May 2024). Small modular reactors are still too expensive, too slow, and too risky. <u>ieefa.org/articles/small-modular-reactors-are-still-too-expensive-too-slow-and-too-risky</u>
- Lane, R. S., Frost, S. E., Howe, G. R., & Zablotska, L. B. (2010). Mortality (1950-1999) and cancer incidence (1969-1999) in the cohort of Eldorado uranium workers. Radiation research, 174(6), 773–785. doi.org/10.1667/RR2237.1



References (continued)

- Lornic, J. (March 2025) Uranium market freezes as tariff threats rattle buyers. Bloomberg News <u>bnnbloomberg.ca/business/2025/03/31/uranium-market-freezes-as-</u> tariff-threats-rattle-would-be-buyers/
- Martucci, B. (May 2025) Some SMRs could bypass environmental review step under Arizona bill. Utility Dive. <u>utilitydive.com/news/arizona-smr-nuclear-environmental-review-billaps-srp/742564/</u>
- Ontario Clean Air Alliance. (May 2025) Ontario signs up for a huge financial and security risk. <u>cleanairalliance.org/financial-and-security-</u> <u>risk/</u>
- Poitras, J. (June 2024). Time for N.B. Power to shop around for nuclear options, ex-CEO says. CBC News. <u>cbc.ca/news/canada/new-</u> <u>brunswick/arc-clean-energy-small-modular-reactors-1.7247328</u>
- Ramana, M.V. (Jan. 2024). The collapse of NuScale's project should spell the end for small modular nuclear reactors. Utility Dive. <u>utilitydive.com/news/nuscale-uamps-project-small-modular-reactor-</u> <u>ramanasmr-/705717/</u>
- Shwartz, A. (May 2022). Stanford-led research finds small modular reactors will exacerbate challenges of highly radioactive nuclear waste. Standford Report. <u>news.stanford.edu/stories/2022/05/smallmodular-reactors-produce-high-levels-nuclear-waste</u>
- U.S. Department of Energy. (2025). Benefits of Small Modular Reactors (SMRs). <u>energy.gov/ne/benefits-small-modular-reactors-smrs</u>
- Willick, F. (May 2025). 'A total surprise': Municipalities unprepared for uranium exploration in their backyard. CBCNews.
 <u>cbc.ca/news/canada/nova-scotia/municipalities-unprepared-for-</u> <u>uranium-exploration-in-their-backyard-1.7535804</u>

