



## Think Small:

How Canada can make small modular nuclear reactors a priority





**Canada has urgent and challenging energy choices to make.** We will need to rapidly scale power generation to service the needs of a growing economy, while simultaneously reducing net-carbon emissions to zero by 2050 to meet our climate targets. Given the current technological outlook, there is no single energy source that can meet those competing demands. But one thing is clear: nuclear power can be a key part of that lower-emissions future – and an increasingly promising option is to commercialize small modular reactors (SMRs).

SMRs are more adaptable versions of today’s large-scale reactors and could solve many of the issues facing the nuclear industry. While most SMRs are still on the drawing board, they promise to reduce the costs of construction and operations, expand the range of applications across the economy, and potentially improve safety factors. If commercialized successfully, SMRs could bring new, non-emitting sources of electricity to big cities and remote communities, while providing flexibility to key Canadian industries that now power production processes with fossil fuels.

The repercussions of SMRs could be far-reaching, with the global SMR market projected to reach \$150 billion to \$300 billion annually by 2040.<sup>1</sup> Given the country’s seven decades of success in nuclear energy, Canada starts from a position of strength. SMRs could revitalize Canada’s nuclear industry, allowing us to export our talent and proven expertise to a world that is committed to triple nuclear power by 2050.<sup>2</sup>

### Types of SMRs

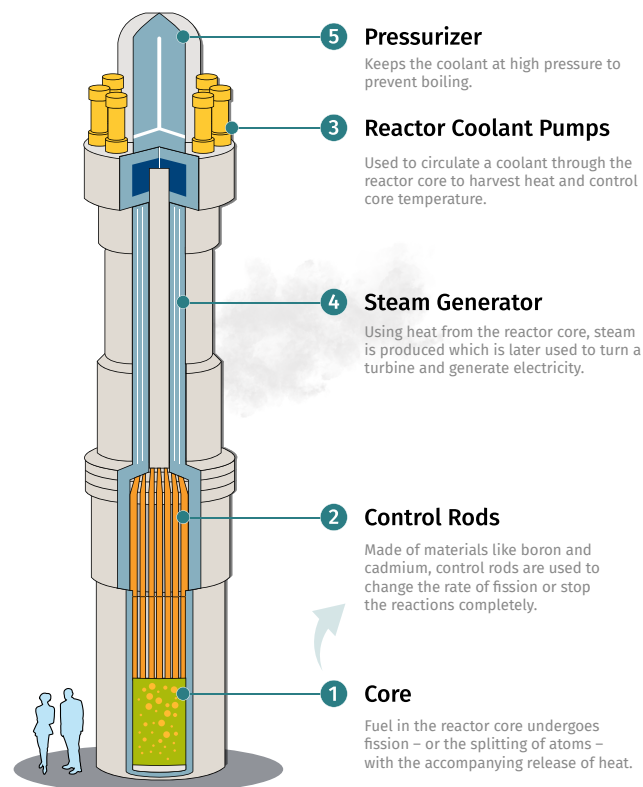
SMRs vary in size, design and components, electrical and thermal outputs, and intended applications. Early SMRs will be used to generate electricity for cities, but the technology’s versatility could mean that scaled-down, or micro-SMRs, could eventually be used by industries, small, off-grid communities, and mines. Like large nuclear reactors, SMRs are broadly classified based on how they are cooled and the way their fission reactions are controlled.

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**Light and heavy water reactors**  
 The most established technology, use water to cool the reactor core and slow down neutrons – subatomic particles that help sustain nuclear fission reactions.
- 
**High-temperature gas-cooled reactors**  
 Uses gases like helium to cool the reactor core and have faster neutron speeds, allowing higher temperatures to be produced.
- 
**Molten salt reactors**  
 Use salts to cool the reactor core. They can operate at high temperatures and can use a range of fuel types.
- 
**Fast neutron reactors**  
 As their name suggests, fast neutron reactors use fast neutrons to trigger and sustain fission reactions, making reactors more fuel-efficient and increasing power production.

Several countries including the U.S. and Britain have announced major public-private partnerships to capture those opportunities.

Canada has already taken an early lead in deploying a new generation of SMRs. One such reactor—GE-Hitachi BWRX-300—is close to the start of construction at the Darlington Nuclear Generating Station east of Toronto. That single SMR, the first of four that will be built at Darlington, could eventually provide electricity for 300,000 homes.<sup>3</sup> Other SMRs in various stages of licensing across the country could eventually power industrial facilities and remote mines and replace diesel in isolated communities.

To optimize the drive to net zero, Canada has formulated a national plan to develop and commercialize SMRs. In 2018, Ottawa created a coalition drawn from various levels of government, Indigenous communities, academia, power utilities and other industries to draw up a coordinated Small Modular Reactor Roadmap.<sup>4</sup> This was followed by an SMR Action Plan in 2020.<sup>5</sup> To remain at the forefront of a potential SMR revolution, Canada must seek further ways to finance and regulate the development and commercialization of reactors. No one expects that will be straightforward. But an effective rollout of a nationwide plan to deploy SMRs promises an adaptable new energy source for the country, and a powerful catalyst for Canada’s transition to a greener economy.



Source: US Department of Energy, RBC Climate Action Institute



**Darlington Nuclear Generating Station**  
 Chuck Lamers, Senior Communications Advisor (Left) John Stackhouse, SVP, Office of the CEO RBC (Middle)  
 Vivian Sorab, Senior Manager, Clean Technology RBC (Right)

# Key findings

85

**Canada will need to build a projected 85 SMRs** at a cost of \$102 billion to \$226 billion to reach our net-zero emissions target by 2050.



**SMRs could help power electrical grids**, while their size and flexibility would allow them to replace fossil fuels in specific industrial processes and other off-grid settings.



**To ensure the country has the expertise to support the growth of an SMR industry**, Canada will need more than 5000 full-time, skilled workers on average between 2025 and 2040.



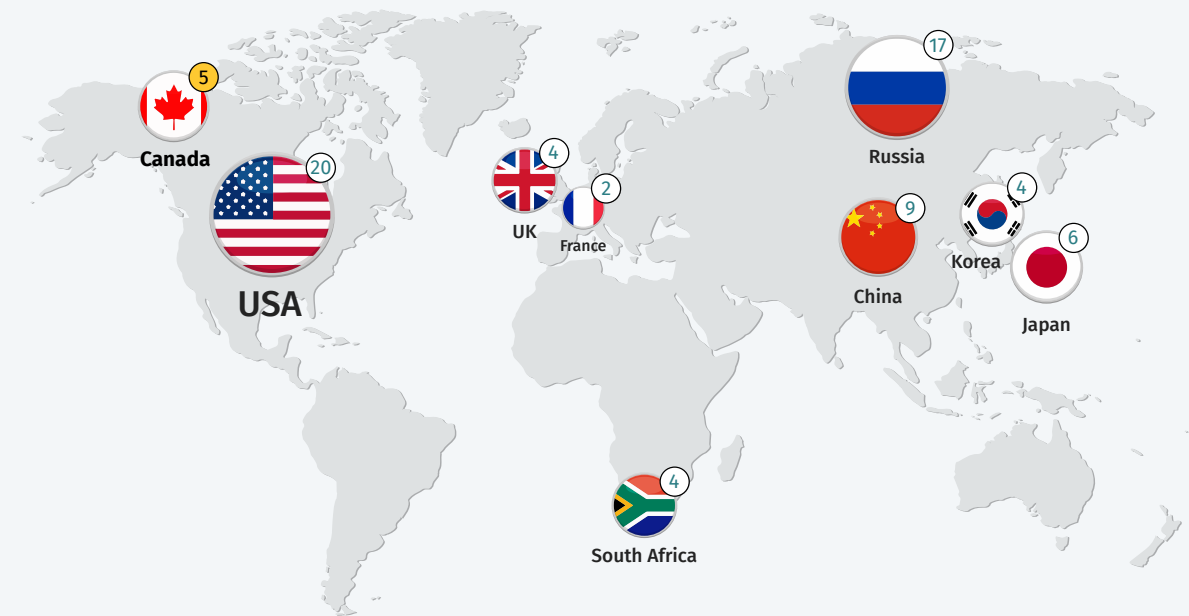
**Indigenous partnerships and expertise are critical** for the development of Canada's SMR industry and supply chains, from uranium mining to component manufacturing and eventually to new projects in areas on or near traditional Indigenous lands.



**With no uranium-enrichment facilities of its own**, Canada will need to work with allied nations such as the U.S. and France to secure stable supplies of enriched nuclear fuel to deploy its SMR fleet.

## SMR designs are being advanced by companies worldwide

Count of SMR designs in development



Source: World Nuclear Association, RBC Climate Action Institute

## What is an SMR?

Nuclear energy has been used to produce carbon-free electricity since the 1950s, providing stability and diversity to national power grids. In addition to large-scale plants, small, bespoke nuclear reactors have been used to power submarines, aircraft carriers and planetary spacecraft. Some small reactors have been installed inconspicuously for research in national laboratories or university campuses, like McMaster University in Hamilton<sup>6</sup> and the Royal Military College of Canada in Kingston.<sup>7</sup>

SMRs were conceived to address conventional nuclear's long construction timelines and escalating costs by leveraging some key attributes of small reactors. SMRs are like conventional nuclear fission reactors, but are designed to be built in factories, and assembled on-site to exploit economies of scale through multiple units to reduce costs. They could also include enhanced safety systems, digitalization, and streamlined operations. They are typically defined as reactors that have at most 300 megawatts of capacity, which would make them about a third the size of a conventional nuclear plant, and can be as small as 5MW.<sup>8</sup>

Not all SMRs meet the 300MW criterion — and not all reactors smaller than 300MW are SMRs. Companies in Britain, for instance, are developing SMRs rated at 470MW capacity,<sup>9</sup> and India's nuclear reactor fleet includes several reactors rated at 220MW that are not considered SMRs.<sup>10</sup>

Climate change has renewed interest in the nuclear industry, particularly SMRs. While there are an estimated 98 SMR designs around the world in various stages of development, only Russia and China are currently operating commercial SMRs. The majority of SMRs remain in the design phase. The U.S. has the most SMR designs under development, followed by Russia, China, Japan and Canada. Denmark, with no native nuclear power, is also pursuing the technology with a floating SMR design.<sup>11</sup>

Although a handful of private players are working to commercialize SMRs, government support is key for the technology to scale. In the U.S., the Department of Energy and private companies have jointly invested over \$1 billion in SMR development.<sup>12</sup> The Tennessee Valley Authority (TVA), the largest U.S. public utility, has thrown its weight behind SMR technology. As early as 2019, it obtained federal approval for SMRs at its Clinch River Nuclear site.<sup>13</sup> In November 2020, Britain announced a £215 million spending package to be matched by private investment.<sup>14</sup>

In 2022, Canada announced \$29.6 million for research and supply chain frameworks, \$70 million for research on minimizing SMR waste, and \$51 million for the Canadian Nuclear Safety Commission to build regulatory capacity for SMRs.<sup>15,16</sup> In the same year, the Canada Infrastructure Bank provided \$970 million in funding for the Darlington SMR.<sup>17</sup> New Brunswick invested \$10 million in 2018 to establish a research cluster for SMRs,<sup>18</sup> and another \$80 million in total in two advanced SMR companies.<sup>19</sup> Saskatchewan invested \$80 million in a micro-SMR project in 2023.<sup>20</sup>

To remain in the forefront of the potential SMR revolution, Canada will need to continue to refine the ways it finances and regulates the development and commercialization of the reactors.



# A strategic moment for Canada

SMRs could be a significant part of Canada's future energy mix. The size of the share depends on how quickly SMRs can be developed and deployed. Given the current technological outlook, SMRs have several advantages compared to the other main energy sources.

**Hydroelectric projects** have been a mainstay of the Canadian energy landscape, but big projects are not possible or viable in many parts of the country, their massive expense, land impact, and the lack of new, quality resources make the case for new dams challenging. Prolonged droughts may challenge their reliability.

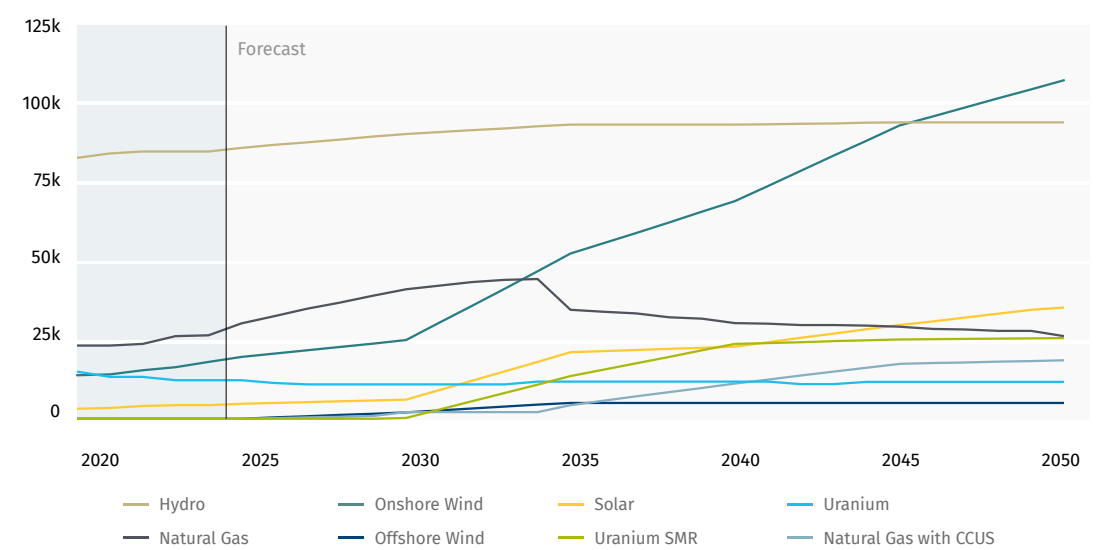
**Renewables such as wind and solar** provide relatively inexpensive electricity compared to nuclear options. But that power is intermittent, dependent on when the sun shines and the wind blows, which means renewables generally need to be backstopped by expensive batteries or emissions-intensive natural gas.

**Natural gas plants retrofitted or built with carbon capture and sequestration (CCS)** could provide relatively clean and reliable power. But on the drive to net zero, they will largely be limited to geographies where emissions can be captured and stored underground (mostly Western Canada), in a process that often comes with a hefty price tag and uncertainties in economics and commercialization potential.

**Nuclear energy**, to reach its potential, must overcome a track record that has included cost overruns, long project timelines, and low social acceptance in parts of the country such as British Columbia and Nova Scotia. There also continue to be concerns around nuclear safety and waste management. Nuclear is the world's second-highest source of zero-emissions power after hydroelectric dams but its share of global electricity production has dropped from 17% in the 1990s to 9% today (with natural gas, coal and renewables filling the gap.)<sup>21</sup>

## SMRs will be the 5th largest source of power in a net-zero Canada

Installed capacity, MW

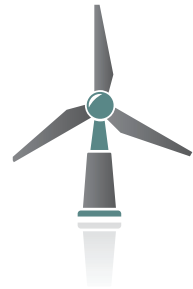


Source: Canada Energy Regulator, RBC Climate Action Institute

**SMRs**, if commercialized, could accelerate nuclear project timelines, lower costs, and bring nuclear to geographies with grids too small to accommodate large power plants. Under a net-zero scenario from the federal Canada Energy Regulator, the country will need 25 gigawatts of SMR capacity—equivalent to about 85 grid-scale SMRs—by 2050, which would provide 7% of Canada's power capacity. Under that scenario, onshore wind would account for 30% of the total, hydro 26%, utility-scale solar 10%, abated natural gas 7% and large nuclear 3%.<sup>22</sup> By leveraging SMRs as a source of non-emitting power, Canada could save 41 megatons of emissions, on average, annually between 2030 and 2050 relative to unabated natural gas generation.<sup>23</sup>

Darlington Nuclear Generating Station

# SMRs applications



## Grid-scale power generation

Canada's electricity supply is one of the world's greenest, with 81% of its generation fed by hydro, nuclear, and wind and solar power.<sup>24</sup> But there is no easy solution that would decarbonize the 19% of Canada's grid that still relies on fossil fuels.

Successful deployment of SMRs would unlock a new source of carbon-free power for Canada's electrical grids. SMRs scalability make them suitable for grids of varying sizes and location. And with technological, social, and commercialization issues currently limiting growth of other energy options in Canada, SMRs are expected to be competitive with other sources of power on a cost-of-generation basis.<sup>25</sup>

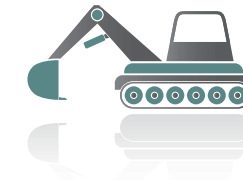


## Industrial processes

Reducing the 75 megatons of CO<sub>2</sub> equivalent emitted annually from Canada's industrial sector<sup>26</sup> is a net-zero imperative. SMRs can help Canadian industries decarbonize by providing uninterrupted, non-emitting electricity and heat to commodity producers. In the longer term, SMRs could be used to produce low-emissions hydrogen and synthetic fuels that may aid in the carbon-intensive steel, cement and petrochemical industries.

The SMRs could be used at individual sites for specific applications — like the chemicals and pulp and paper sectors to create steam currently produced by burning natural gas. These applications would provide a competitive edge to Canadian companies whose customers need lower-carbon materials.

But deploying SMRs will be difficult in certain industrial processes given existing technologies. Steelmaking in blast furnaces and cement manufacturing require temperatures at or above 1,000 Celsius, which current SMR designs would not be able to produce.<sup>27</sup>

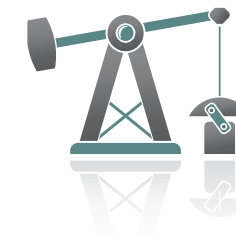


## Mining

The mining sector produces 2% of national emissions,<sup>28</sup> but has made steady progress on decarbonization. For instance, nickel miners are converting their mine vehicle fleets to electric<sup>29</sup> and pursuing projects that use tailings to capture CO<sub>2</sub>.<sup>30</sup>

SMRs may be able to push many other mining operations closer to zero emissions—particularly if the sites are beyond the reach of electricity transmission infrastructure—by displacing diesel generators and providing electric power for mine vehicles.

But complexity varies and some mines will be more challenging to decarbonize. Canada's largest and heaviest carbon-emitting mines are the massive iron ore operations in Newfoundland and Labrador, Quebec and Nunavut. These operations will continue to rely on fossil fuels in the near-term because there are no alternatives at present that can produce the high temperatures (at least 1,300 C) they need to process ore.<sup>31</sup>



## Oil sands

Decarbonizing this carbon-intensive sector is arguably Canada's greatest climate challenge. Oil sands extraction is responsible for 12% of national emissions,<sup>32</sup> and consumes 30% of the Canada's natural gas output,<sup>33</sup> which it burns in boilers to produce steam for in-situ production techniques.

If SMRs can be commercialized, they will be a strong contender to lower emissions in the oil patch. By producing high quality, high temperature steam, SMRs can replace natural gas boilers at in-situ oil sands facilities, cutting off emissions at their source. Unlike carbon-capture technologies, SMRs would not require further infrastructure such as CO<sub>2</sub> pipelines and underground storage downstream. By deploying a large SMR to the highest emitting facilities, oil sands producers could theoretically displace natural gas emissions at a capital cost of \$1.6 billion to \$2.6 billion. For smaller facilities, six or seven micro-SMRs may be able to abate emissions at a capital cost of \$300 million to \$700 million.<sup>34</sup>

# The path ahead: What Canada needs to go big on SMRs

## Capital: Reaching net-zero targets will need \$9 - \$20 billion for SMRs annually.

Large nuclear power plants have a track record of going over budget during construction. Capital costs for large-scale nuclear plants in the U.S., France, Canada and Germany have escalated 60% to 200% since the 1970s,<sup>35</sup> and some recent projects exceeded their budgets by billions of dollars.<sup>36</sup>

SMRs could eventually reverse that trend—at least on paper. Lower design complexity, better safety features that may streamline regulation, and potential modular manufacturing and on-site assembly are all features that advocates say will help them overcome the industry's cost problems. If SMRs can be built on time and on budget, they may be cost competitive with other sources of low- or non-emitting energy.

The SMR record is still nascent, and therefore difficult for capital markets to assess. There are only two SMRs operating commercially, one in Russia, the other in China; both saw cost escalations and project timeline delays.<sup>37</sup> An SMR in Argentina has been under construction since 2014. With only a handful of projects in advanced development around the world, it is unclear whether SMRs will achieve economies of scale and lower their costs in the near-term.

Building the 85 SMRs that Canada needs to reach our net-zero climate targets will cost a projected \$102 billion to \$226 billion.<sup>38</sup> Because of nuclear's long lead times, that spending will have to begin soon. Under one net zero forward trajectory, Canada's power sector will need 93% of Canada's SMR capacity to be built before 2040.<sup>39</sup> Capital spending to support that rapid growth in the 2030s will need to reach an average of \$9 billion to \$20 billion annually.<sup>40</sup>

Canada already has one advantage in place. The federal clean technology investment tax credit could offset 30% of the capital costs for SMRs. Based on current projections, the credits would lower the cost of electricity from SMRs by 24% while boosting their competitiveness.<sup>41</sup>

**Ways forward:** Federal and provincial governments can draw in private capital with their current and proposed suite of fiscal incentives to de-risk project finance. The Canada Infrastructure Bank could also help spur early, grid-scale SMR deployment.

## Indigenous partnerships: Early momentum must grow for SMRs to reach their full potential.

In building a new fleet of SMRs to generate clean power, Canada can plan the newest phase of its energy transition in concert with Indigenous communities at all stages of the SMR value chain, from uranium mining through to project development and operation, and eventually spent fuel management.

Early signs have been encouraging. Indigenous groups are already seeking opportunities in Canada's SMR buildout, and government funding has helped establish bodies such as the Indigenous Advisory Council to provide a unified national voice for Indigenous communities around SMRs.<sup>42</sup> In New Brunswick, the North Shore Mi'kmaq Tribal Council and its seven First Nation member communities signed equity agreements last year with Moltex Energy Canada and ARC Clean Technology Canada to develop and deploy advanced SMR technology.<sup>43</sup> In Saskatchewan, three Indigenous-owned companies partnered in 2021 to jointly invest and build businesses to service SMR markets.<sup>44</sup>

**Ways forward:** The sector can maintain early momentum with Indigenous community engagement and capacity-building. As micro-SMR technologies advance, technology vendors, project developers and end-users can further prioritize engagement and knowledge-building in remote areas, where micro-SMRs may best be deployed.

## Exports: Canadian SMR expertise could service a \$3 - \$10 billion market by 2040.

Building out a successful national SMR industry could create a substantial export opportunity for a new generation of Canadian nuclear. Key areas of opportunity include licensing the GE-Hitachi BWRX-300 design, scheduled to be built at the Darlington nuclear plant. Provincial crown corporation Ontario Power Generation, the Tennessee Valley Authority electric utility and the Polish company Synthos Green Energy invested \$400 million to bring the BWRX-300 design to completion.<sup>45</sup> Should this design scale, OPG would share technology licensing revenues from future BWRX-300 projects.

Canadian project management expertise will also be in demand. The emergence of a successful SMR industry could create a \$3 billion to \$10 billion annual opportunity for Canadian expertise by 2040 in pre-construction (e.g., land acquisition, environmental studies, permitting), and indirect services (e.g., engineering, project management, quality assurance, testing, and commissioning).<sup>46</sup>

Export opportunities could extend to other parts of the SMR industry, such as uranium supply and conversion. Canada is the world's second-largest uranium miner, after Kazakhstan—producing 15% of global uranium supply.<sup>47</sup> A tripling of global nuclear capacity by 2050, as projected at the COP28 UN Climate Change Conference in Dubai, would create significant opportunities for Canada's uranium mining industry.

Uranium conversion—the processes that transform raw uranium ore to fuel- or enrichment-ready products—is another area of opportunity. Canada controls 28% of the world's operating uranium conversion capacity, which is less than Russia (38%), but ahead of China (25%) and France (8%).<sup>48</sup>

**Ways forward:** Canada can add to existing strengths by streamlining permitting for new uranium mines and expanding cooperation with allied countries to supply uranium conversion services. It can also build early relationships with foreign partners, especially countries with limited nuclear experience, by sharing expertise in community engagement, technology, and building societal acceptance for nuclear.

**Social license: Positive perceptions around nuclear will accelerate adoption.**

To streamline the introduction of SMRs, the private sector and the federal and provincial governments will have to overcome negative perceptions about nuclear energy. They will also face government restrictions in certain provinces: B.C. has a long-standing ban on nuclear power generation,<sup>49</sup> and Nova Scotia has only recently reopened the possibility of nuclear power generation in the province.<sup>50</sup>

Polls indicate Canadian societal attitudes to nuclear power are changing. Between 2012 and 2023, Canadian public support for nuclear power increased from 37% to 55%, with 62% now viewing it as essential to Canada’s net-zero strategy. A majority of the public in Ontario, Saskatchewan, and Alberta supports nuclear power, as do pluralities in Manitoba and the Atlantic provinces.

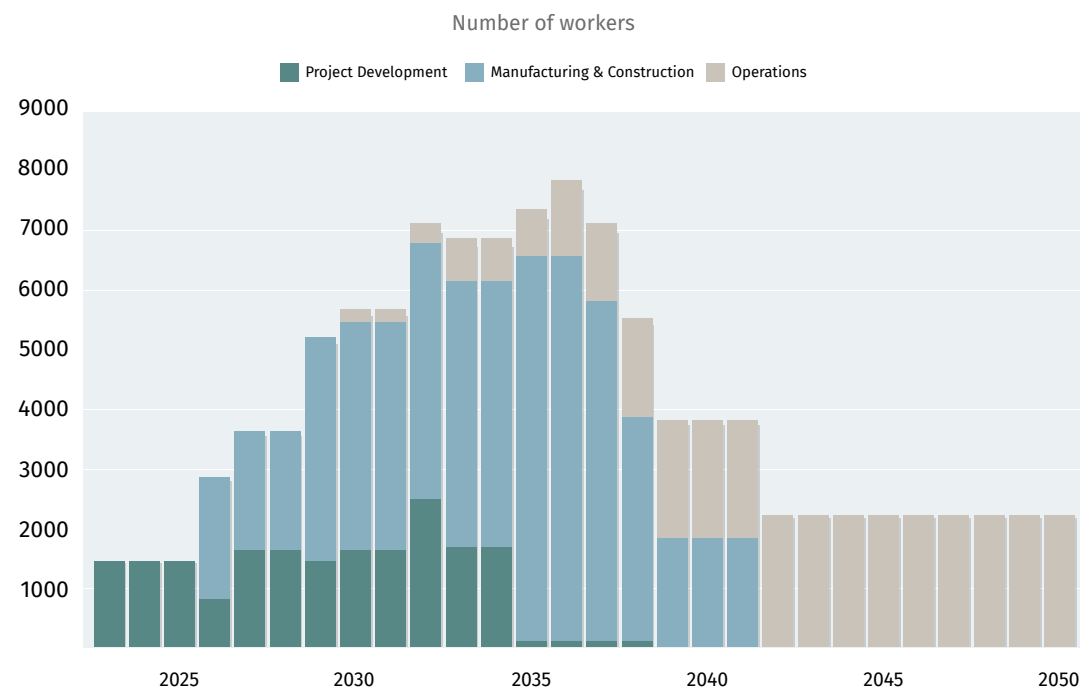
Public opinion polls indicate Canadians who may oppose a nuclear project deemed beneficial if it was built close to where they live are increasingly in the minority. Surveys that attempt to capture public concerns about the selection of new plants and nuclear waste management sites have indicated local opposition to new projects—including nuclear—peaked in 2011 and have been in decline ever since.

Other challenges persist. In 2022, 60% of Canadians said they had never heard of SMRs and another 25% said they were only vaguely aware of them. Skeptics were not convinced by the information about SMRs’ smaller footprint, affordability and enhanced safety, but were open to learning more.<sup>51</sup>

**Skills: A new workforce is essential to build Canada’s SMR fleet.**

Canada will need a rapid revitalization of its nuclear workforce to support growth of the SMR industry in the coming decades. At least a third of the country’s nuclear professionals were approaching a retirement age in 2019. Ensuring that the country has the nuclear-critical skills it needs will be key, as 4,000 professionals across all trades are set to retire by 2025.

**Canada needs a new workforce to build and operate its SMR fleet**



Source: Conference Board of Canada, NB Power, RBC Climate Action Institute

Building and operating the near-term SMR fleet in Ontario, Saskatchewan and New Brunswick, and Alberta will require an average of 5,300 workers between now and 2040, and about 2,400 to operate and maintain the fleet thereafter. To service domestic and international demand, associated sectors like uranium mining and processing will need to grow their workforces as well.

**Ways forward:** Canada could follow the example of Britain, which in partnership with several industry players has committed £763 million to revitalize the country’s defense and civil nuclear sector, aiming to fill over 40,000 new jobs expected by the end of this decade, and augment apprenticeship programs and advanced studies.<sup>52</sup>

**Enriched uranium: Canada must build partnerships abroad to secure SMR fuel.**

Because its CANDU reactor fleet runs on natural uranium, and an international treaty prevents the country from enriching uranium at home, Canada has not developed domestic uranium enrichment capacity.<sup>53</sup> Canada will need to look beyond its borders for enriched uranium to run a future nuclear fleet that will almost certainly need the fuel. The amount it requires will depend on what designs get developed, both in terms of SMRs and large nuclear power plants.

All but one of the SMR designs being commercialized in Canada today require uranium to be enriched to different degrees. Canada’s earliest SMRs will be fueled by Low Enriched Uranium (LEU), which will initially be sourced from France and the U.S.<sup>54</sup> More advanced designs will need High-Assay Low Enriched Uranium (HALEU).

Uranium enrichment is geographically concentrated. As of 2022, Russia controlled 40% of the world’s enrichment capacity,<sup>55</sup> and it is the only commercial producer of HALEU. Issues over accessing HALEU have already disrupted SMR projects in the U.S. As nuclear’s resurgence comes up against stagnant enrichment capacity, following years of oversupply and underinvestment, enriched uranium could become bottlenecked in the future. Addressing that bottleneck could become critical.

**Ways forward:** Canada will need to advance cooperation with allies to strengthen global enriched uranium supply chains and secure supplies of LEU and HALEU. Canada can turn to its partnership with other nations in the newly formed “Sapporo 5” (Japan, the U.S., Britain, and France) to invest in an international uranium enrichment centre and strategic enriched uranium stockpile.

## Waste: Research and development will prepare Canada for spent SMR fuel.

Spent nuclear fuel in Canada currently comes from the country's CANDU reactor fleet and has been safely managed since the first commercial reactors began operating about five decades ago. As Canada commercializes SMR designs, new types of spent nuclear fuel will require long-term management. The physical properties, quantities and management protocols around spent fuel will vary significantly between different SMR designs. In some cases, spent fuel will be of a kind that is well understood and for which management protocols exist internationally. For others, new waste-management protocols will need to be developed.

**Ways forward:** SMR vendors will need to continue to invest in research and development on advanced fuels, and closely coordinate their work with the Nuclear Waste Management Organization, to advance designs for managing fuel. That will include specific engineering solutions for managing SMR fuel and its eventual containment and isolation in a Deep Geological Repository, to contain spent fuel in perpetuity. Canada is progressing towards selecting a site for a DGR.

## Large nuclear: Essential for Canada's growing energy needs.

SMRs could help decarbonize and expand electricity grids servicing large and small population centers and provide energy to beachhead industrial markets. But as electricity demand grows, traditional large nuclear power plants must continue to play a role. Proven conventional nuclear technologies, such as Canada's home-grown CANDU reactor and potential alternative technologies from abroad, are well placed to provide additional non-emitting capacity.

With the exception of the Point Lepreau reactor in New Brunswick, Canada's nuclear fleet is concentrated in Ontario. With the successful refurbishments of two units in Darlington almost half a year ahead of schedule, and commitments for additional refurbishments at the Pickering Nuclear Generating Station, Canada is set to keep the fleet running for at least another 30 years.<sup>56</sup> But translating this experience into new nuclear capacity will be essential if we are to reach its climate goals while maintaining secure energy supplies.

**Ways forward:** Utilities can begin long lead-time activities like the identification and assessment of potential sites for new large nuclear power plants and initiate early discussions around community engagement, permitting, and transmission planning, especially for areas that are not currently licensed for new nuclear buildout.

# Preparing for the age of small

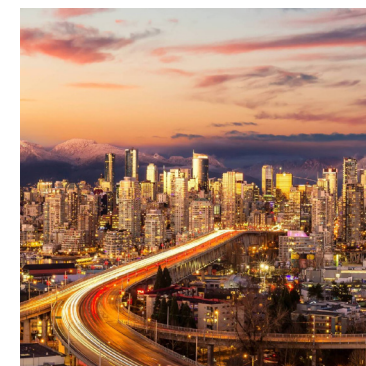
Canada has been a global leader in the peaceful use of nuclear energy for over 75 years. Early research at labs in Montreal and Chalk River helped lead to breakthroughs in the industry and development of the safe and versatile CANDU reactor technology, which has been used across eastern Canada and exported to six other countries. The Pickering, Bruce and Darlington nuclear generating stations have been strategic drivers through the 1990s, producing important supply chains in Ontario and employing tens of thousands of skilled workers. While fiscal tightening and global nuclear-safety fears arrested the industry's growth in the 1980s and 1990s, decisions to reinvest in Bruce and Darlington have since brought the sector new life.

The promise of SMRs now presents Canada with new choices about our nuclear future. If SMRs can be developed and commercialized quickly and cost-effectively, they can help Canada meet growing demand for electricity and its commitment to reach Net Zero by 2050. But we will need to move faster. For Canada to achieve Net Zero emissions by 2050, 93% of SMR capacity must come online in the 2030s, more than twice as fast as Canada achieved its conventional nuclear capacity buildout between the 1970s and 1990s.<sup>57</sup>

The good news is that Canada is taking an early lead in deploying SMRs. The GE-Hitachi BWRX-300 prototype is nearing construction at Darlington, while other SMRs are in various stages of licensing. Success could unlock a new source of energy for non-emitting baseload power for Canada's grids, and off-grid power for remote locations. Success will also position Canada to be an important exporter of SMR components and expertise.

Canada will need to be nimble. Nuclear power is by far our most complicated source of electricity. And the commercialization of advanced approaches to nuclear, through SMRs, will require a diverse mix of capital, skills, fuel supplies and public policy. That, in turn, will require a coordinated national approach to make this potentially transformative technology a key part of our energy future.

## Recommended Reading



**Canada's Energy Transformation:**  
[An Outlook of Supply and Demand In the 2030s](#)



**SMRs:**  
[World's new Net Zero darling](#)



**Power Shift:**  
[How Ontario Can Cut Its \\$450-Billion Electricity Bill](#)



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