



Ontario's Costly Nuclear Program

David Robertson
Chair
Ontario Project Group
SCAN!
Sept 21, 2026

Introduction:

This background brief provides supporting arguments for a request to the Auditor General to conduct a Value-for-Money Audit of Ontario's nuclear program. The Ontario government is expanding nuclear electricity on three fronts - new large-scale reactors, small modular nuclear reactors and refurbishments of old nuclear reactors - all of which have significant financial consequences for Ontario ratepayers and taxpayers.

Section 12(2) of the Auditor General Act requires that the Office of the Auditor General report on any cases where it has been found that money was spent without due regard for economy and efficiency.

The Ontario government's nuclear program involves the expenditure of unprecedented and unparalleled amounts of money that is being committed without 'due regard for economy and efficiency.'

Ontario ratepayers and taxpayers are being over-charged for electricity because of the government's decision to pursue very expensive nuclear electricity. The nuclear program of Ontario Power Generation (OPG), a government owned enterprise, fails on a 'cost-effectiveness' metric. The costs of renewables (and battery storage) have plummeted over the last decade. But Ontario ratepayers and taxpayers are unable to take advantage of the falling prices. Instead, there is a tightening nuclear lock on the energy system which ignores the needs of Ontario families for cost-effective, clean, secure, reliable, and sovereign sources of energy. In a rapidly changing energy landscape the Ontario government and its wholly owned OPG, are increasingly isolated-outliers as the rest of the world rapidly shifts to renewable energy.

The brief is organized in five sections:

Section 1 provides a summary of the reasons a Value for Money audit of Ontario's nuclear program is needed.

Section 2 provides estimates of the costs of nuclear energy. It explains the two headline measures of cost per kilowatt and cost per megawatt hour. It applies these costs to the proposed large-scale reactors at Bruce in Kincardine and the New Nuclear at Wesleyville in Port Hope. It also compares the cost of nuclear energy with the costs of solar, wind and storage.

Section 3 reviews the recent history of the development of Small Modular Reactors (SMRs) in Canada. It reviews the costs of the New Nuclear at Darlington project and highlights the recent shift to large scale reactors.

Section 4 reviews the Ontario government's nuclear 'refurbishment' program at Darlington, Pickering and Bruce Power.

Section 5 provides some concluding remarks about the dramatic shifts in the energy landscape and how renewable sources of energy are now the optimal solution for electrifying the system.

Section 1: The Need for a Value-for-Money Audit

Ontario Power Generation claims that nuclear is "reliable, safe, low-cost, and carbon-free power". However, many of those descriptors are false and misleading. In the face of such institutional promotion the public interest is best served by an evidence-based inquiry and data-driven decision-making.

The Auditor General has noted that:

"Our value-for-money (VFM) audits examine how well government ministries, organizations in the broader public sector, agencies of the Crown and Crown-controlled corporations manage their programs and activities...In essence, VFM audits delve into the underlying operations of the ministry program or organization being audited to assess both their cost-effectiveness and the level of service they deliver to the public."

The Auditor General has previously reviewed nuclear proposals. In 2018 the Office reported on the refurbishment of Darlington. Today the need for an independent review is even more compelling, in part because of the size and costs of the nuclear program; in part because of the dramatic shift in energy economics; and, in part because of the changes in legislation and regulations which have constrained the independence of regulatory authorities and crown agencies.

1. An expensive expansion of nuclear reactors

The Ontario government is committed to the largest and most expensive expansion of nuclear reactors in Canada's history. The first-generation nuclear buildout in Ontario, from the sixties through the nineties, resulted in 20 reactors (8 at Bruce, 8 at Pickering, 4 at Darlington) capable of producing about 13,800 Megawatts (MW) of nuclear electricity.

The current expansion plan includes the construction of four small modular nuclear reactors at Darlington with a combined rating of 1200 MW; the construction of four large-scale reactors at Bruce with a capacity of 4800 MW; and the construction of 8-10 large-scale reactors at Wesleyville in Port Hope with a capacity of 10,000 MW. The 16,000 MW of new nuclear capacity will be augmented by the refurbishment of 14 old reactors for about 12,000 MW of additional nuclear energy.

According to the Ontario government's policy paper "Energy For Generations", by 2050 nuclear will account for about 75% of our electricity supply. Currently France, Slovakia and Ukraine are the only three countries in the world where the share of nuclear generated electricity is over 50%.

The Ford government's nuclear program is unprecedented in terms of costs and risks. The refurbishment program is estimated at \$54.5 billion. The forecast price tag for the four small modular reactors (SMRs) is \$20.9 billion. There are no official cost projections for new large-scale reactors at Bruce and Wesleyville but the range is likely between \$72.5 and \$114.7 billion for Bruce C and between \$151-\$238.9 billion for Wesleyville in Port Hope. (See section 2 for calculations)

Combined, those costs amount to a staggering \$298 billion at the low end and an astronomical \$429 billion at the high end.

The above costs also don't include the full costs of decommissioning the plants at the end of their life. They don't include the costs for the Deep Geological Waste Repository for the storage of radioactive spent fuel rods. Those costs are estimated at \$24 billion (2026 \$). This estimate is on the low side since it only applies to 3.6 million spent fuel rods.

These massive costs are being incurred without adequate public consultation, without independent fiduciary oversight, and in the absence of sound business cases. Ontario families are being forced to pay for expensive nuclear power today and for the next 70-100 years at a time when energy economics are rapidly and dramatically shifting to cheaper renewables and storage technologies. There is now little doubt that the cost-optimal solution for the electricity grid is wind and solar combined with storage.

2. The risk of stranded assets.

The Ontario government's fleet of nuclear reactors risk becoming stranded assets because of the long time it takes to build the reactors and the long time frame the reactors need to operate to recoup the extremely high up-front capital costs. In its filings

with the Federal Impact Assessment Agency, OPG has presented a schedule for when the proposed 8-10 reactors at Wesleyville in Port Hope could be in service. The first in 2037 and the last in 2048. OPG has also suggested that the reactors will produce over a 70-year lifespan (no reactors have achieved this milestone). OPG further suggests the last unit will operate until 2118. At that point, when the plant is closed, additional costs will still accrue in storing radioactive waste on site for another 30 years. According to the OPG the last nuclear reactor will be decommissioned in 2160.

Given current cost trends and the projected energy trajectories of renewable energy it is hard to imagine that Ontario will still be producing nuclear electricity at the end of this century. It is alarming to think we could still be paying for nuclear reactors in 2160 - one hundred and thirty-four years from when they were proposed. By 2023 wind and solar were already providing a larger share of global electricity production than nuclear (13% versus 9.2% —[International Atomic Energy Agency 2024](#)). Even optimistic scenarios put the nuclear share of world energy at less than 10% by 2050.

The growth of renewable energy is putting long term conventional energy assets at risk of becoming stranded assets. The prospect of stranded assets and the evaluation of those risks are now routinely considered in any energy development decisions. While concerns with stranded assets are more commonly raised in connection with fossil fuel reserves, the current nuclear program in Ontario with its enormous sunk investments and long timelines could trigger unanticipated write-downs and devaluations.

In Ontario we have already seen this happen. In 1999 Ontario Hydro was on the verge of collapse. The nuclear expansion of the 1970's and 1980's had left the utility with a staggering debt. In response the Ontario government shifted that stranded debt onto ratepayers and taxpayers. We are still paying for those past mistakes.

3. Double exposure on costs

By 2050, if, as the government has proposed, 75% of our power is generated by nuclear reactors, the electricity grid will be over-reliant on a small number of generating stations. A grid too dependent on a small number of nuclear reactors becomes inflexible and vulnerable to additional costs. Disruptions and outages from any part of the system are more consequential and the financial costs of ramping up replacement sources of energy to compensate for the outages are extremely high. Consumers end up paying the continued nuclear costs and the additional costs associated with the replacement supply. The current situation of high ongoing nuclear costs combined with the high costs of replacement supplies from fossil gas plants as nuclear plants are being refurbished underscores the point.

4. The need for independent review.

In the last few years, Ontario's energy regulatory system has been significantly altered. The government has adopted a hyper-growth, megaproject approach to economic

development. It has a clear preference for nuclear energy, and it has changed regulations and legislation to assure its priorities are unquestioned.

Through a series of legislative provisions (Bill 165, Keeping Energy Costs Down Act, 2024, Bill 214, the Affordable Energy Act, 2024, Bill 40, the Protect Ontario by Securing Affordable Energy for Generations Act, 202), policy directions (Energy for Generations) and regulations (O.Reg. 53/05) the government has compromised the independence of the Independent Electricity Systems Operator (IESO), Ontario Power Generation (OPG) and the Ontario Energy Board (OEB). These agencies are required to deliver on the government's economic choices and energy preferences. Their ability to express an independent or different point of view is now more limited than it has ever been.

The need for an independent, objective assessment of Ontario's nuclear program is reinforced by the decision of the Federal Impact Assessment Process regarding the New Nuclear Program at Wesleyville in Port Hope.

In its filings with the Impact Assessment process OPG declared that: "No alternatives to the project are being considered."

The Impact Assessment Act clearly states that alternatives should be considered. Under the heading Factors to be Considered is this relevant provision:

Section 22.1. (f) any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;

The Impact Assessment Agency of Canada chose an interpretation that allows a proponent to avoid a review of alternatives where the proponent is acting on the wishes of the government. Its "Guidance" to proponents provides OPG this off ramp: "The alternatives to the project need not include alternatives that are contrary, or not consistent with...a province's formal plans or directives." OPG has argued that its nuclear program is exempt from a consideration of alternatives because it is acting on behalf of the Ontario government.

In the normal course of business operations and especially in considering major project expenditures, there would be a well-developed business case, a robust comparison of the alternatives, an evaluation of opportunity costs, and a comprehensive risk assessment. In the case of Ontario's nuclear program, the absence of such due diligence rips a gaping hole in public policy.

5. Opportunity cost.

Opportunity cost refers to the loss of potential benefit from alternatives that are given up when a decision is made. In refurbishing nuclear reactors and by expanding the nuclear fleet, the Ontario government is guaranteeing that nuclear reactors will supply most of the province's electricity. This high-cost, lock-in will crowd out investments in other energy sources. And ratepayers will be precluded from taking

advantage of alternative, lower-cost, low-emission, grid-scale, electricity generation options.

In 2017 the Financial Accountability Office (FAO) expressed concern with the opportunity risk associated with the nuclear refurbishment program. It notes: “The opportunity cost of this commitment would be the foregone savings if a lower cost and low emissions alternative generation option emerges.”

Those lower-cost and low-emissions alternatives have now emerged.

The FAO report continues: “As a result, shutting down reactors in response to market conditions of insufficient demand or the emergence of lower cost generation alternatives is not always economical. The Nuclear Refurbishment Plan is a long-term and relatively inflexible commitment to buy baseload electricity.”

In 2026 when close to \$75 billion has already been committed to nuclear refurbishments and the Darlington SMRs, and when we are on the threshold of committing hundreds of billions more to large-scale nuclear plants at Bruce and Wesleyville in Port Hope, the issue of opportunity cost and the foreclosing of cheaper and cleaner energy alternatives needs to be reviewed.

6. Cost of electricity

Today’s energy landscape is rapidly changing. The cost of renewables has plummeted. Utility scale solar and onshore wind are now the cheapest sources of new electricity generation.

The growth of battery storage has addressed the issue of intermittency, and it has significantly altered the capacity factor gap between nuclear and renewables.

The rapid development of solar technologies from rooftop, parking lot, and balcony to grid scale projects and agrivoltaics has effectively undermined the nuclear proponents’ argument that renewable energy has too large a footprint. Similarly, the potential for offshore wind has changed the perceived space requirements of wind energy.

Already solar, wind and storage are the least expensive and quickest way to build energy choices. In the years ahead the economics of energy generation will continue to tilt towards renewables. (See section 2)

7. Nuclear is not a solution to the climate crisis

Perhaps when renewables were a nascent technology the case could be made that nuclear reactors were a way to decarbonize the grid and support the transition away from climate-wrecking fossil fuels. In the past, it could be argued that the cost premium paid for nuclear electricity was a reasonable trade-off for a grid with less GHG emissions. Now the ecological and financial calculus is considerably different. We know

there are serious health risks associated with the ongoing operations of nuclear reactors, and we know that the legacy of nuclear waste is ecologically damaging. We also know that the costs of nuclear energy are not sustainable.

A few years ago, the former heads of nuclear power regulation in the US, France and Germany, along with the former secretary to the UK's government radiation protection committee issued a joint statement concluding; "nuclear power is just not part of any feasible strategy to combat climate change." They were convinced that the speed and scale needed for the low-carbon transition to combat the climate crisis was beyond the capacity of the nuclear industry.

8. Energy security and energy sovereignty

The OPG's nuclear program is being advanced at a difficult time in our relations with the United States. Canada is facing threats to our independence together with economic and trade developments that could undermine our sovereignty. There is growing public concern about the degree to which our economy is shaped by foreign interests, how much of our industry is owned by American multinationals, and the share of our resources controlled by foreign investors.

These concerns are heightened in the case of nuclear energy. The public should know if the reactor design is Canadian or foreign controlled, if there is a domestic fuel supply chain, and whether relying on imported fuel increases our vulnerability to the decisions of other countries.

The SMRs at Darlington are a foreign design that is reliant on imported enriched uranium fuel. OPG has to date, refused to commit to a nuclear reactor design at Wesleyville in Port Hope. In its federal impact assessment filings, it provides examples of four nuclear designs under consideration. Three of them are foreign-controlled and rely on imported enriched uranium. Similarly, Bruce Power in its Bruce C expansion plans in Kincardine has identified possible reactor designs, the majority of which are foreign owned.

These reasons suggest that a Value for Money audit of Ontario's nuclear program is timely, important in safeguarding the public interest, and necessary to provide an accurate assessment of the costs of nuclear energy.

Section 2: The Cost of New Large-Scale Reactors

After years of enthusiastic support for small nuclear reactors, the Ontario government is once again pivoting to large-scale nuclear. There are two projects in the planning stage: Bruce C proposed by Bruce Power and the New Nuclear at Wesleyville (NNW) project proposed by OPG.

Bruce Power is a private partnership that leases the Bruce nuclear site from OPG. The partners are TC Energy, OMERS, the Power Workers Union, and the Society of United Professionals.

Bruce C involves the construction of four additional large-scale nuclear reactors. These new reactors are expected to generate 4800 MW of electricity. The company expects construction and commissioning to take 14 years from 2031 to 2045.

Ontario Power Generation plans to build 8-10 new nuclear reactors at Wesleyville in Port Hope, producing 10,000 MW of electricity. If built, the NNW project will be the largest and costliest nuclear plant in the world.

If Bruce C and the NNW projects, go ahead there will be 12-14 new large-scale reactors built in Ontario. Both projects are in the early stages of the federal Impact Assessment process. Neither project is required to consider alternatives to nuclear energy. Neither project is required to provide a detailed description about the design of their nuclear reactors. Neither project is required to provide any cost estimates.

Two central considerations in the development of any new nuclear project are the choice of reactor design and the cost of the project. Since the capital cost of nuclear reactors is the determining factor in the final cost of electricity, it is the headline and the bottom-line consideration. Neither Bruce Power nor OPG has provided any cost forecasts for their projects.

In the absence of official forecasts there are two sets of calculations that can be used to estimate the costs of nuclear energy. One deals with the cost of building the nuclear plant and another estimates the cost of the electricity produced by the nuclear reactor. The two most important numbers in energy cost comparisons are the 'cost per kilowatt' and the 'cost per megawatt hour'.

The cost per kilowatt is a calculation that divides the capital cost of a nuclear plant by its output. It's a top-line metric that is expressed in dollars per kilowatt of capacity. Since most of the cost of nuclear is the upfront capital costs this figure is a critical driver of nuclear economics.

The capital costs of Bruce C and NNW can be estimated by using industry benchmarks and by using the actual costs of recent nuclear builds in other countries.

Lazard is a prominent and the most-cited source for energy cost comparisons. The company produces an annual report that compares the costs of a range of energy options.

Its 2023 report presented a comparison of the capital cost of new power generation facilities. The cost for new nuclear plants ranged from \$8,475/kW to \$13,925/kW (US). Converted to 2023 Canadian currency the midpoint cost was \$15,120/kW. Using the

mid-point cost (a conservative estimate for the cost of nuclear plants) and applying it to Bruce C and NNW gives us the following estimates:

The cost of Bruce C, if it was built in 2023, would have been \$72.5 billion (C\$). On the same basis the cost of NNW would be \$151 billion (C\$).

If, instead of using Lazard's mid-point, the calculations were based on the actual or projected costs of recently built or under construction nuclear plants, then the costs would be considerably higher.

The most recent reactors to be built in the US are the two at the Vogtle plant in Georgia which came online in 2023. Originally estimated to cost about \$14 billion (US) the final price tag was \$36.8 billion (US) to produce 2200 MW of electricity. Converted to Canadian dollars those figures produce a cost of electricity at \$23,752 per kilowatt. (2024 C\$)

Another data point is the Hinkley Point C nuclear reactor in England. The latest cost is around \$87 billion (2026 C\$) for a 3260 MW plant, and the completion has been pushed back to 2030. That works out to \$26,687 per kilowatt (C\$).

Flamanville is the most recent and most expensive nuclear plant in France. It came online in 2024, at a cost, according to the French court of auditors, of about \$23.7 billion Euros for a plant that produces 1650 MW. It had a huge cost overrun, and it took 12 years to build. Converted to Canadian currency the cost is about \$21,258 (2024 C\$) per kilowatt.

The average of Vogtle, Hinkley C and Flamanville puts the cost to build a nuclear plant at \$23,899 per kilowatt.

On that basis the cost of Bruce C would be \$114.7 billion if it was built now. The cost of the New Nuclear at Wesleyville would be \$238.9 billion.

These are astronomical numbers.

The huge capital costs required to build nuclear plants makes the electricity produced by these plants very expensive.

Energy cost comparisons:

The energy industry uses a set of metrics to evaluate and compare the cost of different energy sources. An important calculation is the Levelized Cost of Energy (LCOE). This measure takes into consideration all the costs of building and operating an energy facility over its lifetime. It includes the capital costs, the maintenance and operating costs, the fuel costs, and the amount of energy produced over the life of the asset. Using these inputs, it arrives at the price at which the electricity would need to be sold.

These calculations provide a bottom-line figure of ‘dollar per Megawatt hour’(MWh). In a competitive energy market this figure would be the deciding factor in the choice of energy solutions.

Lazard’s Levelized Cost of Energy report provides the costs as a range from low to high. The 2025 edition shows unsubsidized utility-scale solar at roughly \$38 to \$78 per MWh. Onshore wind is estimated in a range from \$37 to \$86 MWh. These are the cheapest new build sources of electricity. New nuclear is much more expensive in a range of \$140 to \$220 per MWh. (These figures are in US dollars and apply to projects in the United States.)

This is how Lazard expressed its 2025 conclusion:

“Despite facing macro challenges and headwinds, utility-scale solar and onshore wind remain the most cost-effective forms of new-build energy generation on an unsubsidized basis (i.e., without tax subsidies). As such, renewable energy will continue to play a key role in the buildout of new power generation in the U.S. as the lowest-cost and quickest-to-deploy generation.”

In Canada renewable energy is also the lowest cost and quickest-to-deploy generation. There are several studies that provide the evidence.

Ontario Clean Air Alliance (OCAA)

In May 2025, the Ontario Clean Air Alliance engaged the Energy Futures Group to compare the LCOE of different energy sources in Ontario. The study used data from the IESO and uses 2030 as its reference year and is expressed in US dollars.

The study pegs the unsubsidized costs per megawatt-hour (converted to Canadian dollars) at:

- \$45 to \$70 MW/hour for onshore wind;
- \$74 for utility scale solar;
- \$143 to \$155 for offshore wind;
- \$396 to \$437 for first of a kind SMR,
- \$382 to \$421 for conventional nuclear plants.

These results show nuclear as the most expensive energy choice for Ontario. In its filings with the OEB, OPG puts the LCOE for the Darlington SMRs at \$149 (2024 \$). While this is considerably less than the Energy Futures estimate it is still considerably higher than the costs of utility-scale solar and onshore wind.

Environmental Defence

In June 2026 Environmental Defence released 'The Real Costs of Ontario's Nuclear Gamble'. Environmental Defence commissioned Power Advisory LLC to provide a technical analysis of the costs of various energy options in Ontario, comparing the announced plans for the nuclear expansion against an alternative of renewables and storage. Power Advisory's background report, Ontario Electricity Supply Pathways, provides a very detailed analysis using deliberately conservative assumptions.

The study notes a huge difference between the capital costs of Ontario's planned nuclear expansion compared to producing an equivalent amount of electricity by building renewables and storage. Environment Defence notes: "The findings are stark.... That \$117 billion gap will show up on electricity bills for decades to come."

In addition to studies comparing the cost of energy using industry metrics there are on-the-ground developments that allow for comparisons.

Pembina Institute

In January 2026 the Pembina Institute released a report tracking the costs of solar in installed applications. A look at projects built in Canada shows a clear trend: contracted energy costs from wind and solar have been cut in half over the last 10 years. The report goes on to note; "analysts expect that the cost of renewables will continue to drop further by between 25 to 50 per cent over the next decade".

The report also notes that "(l)n contrast, the cost of new nuclear projects, including refurbishments, has risen over the same period, so that the energy delivered by nuclear projects contracted over the last couple of years will likely be two to three times the cost of energy from renewables projects contracted in that year. We estimate the Pickering nuclear refurbishment will deliver power at \$266 per megawatt-hour (MWh), and the Darlington small modular reactor project will be \$152 per MWh; compare that to wind and solar procured in Saskatchewan and B.C. at \$64-110 per MWh."

Hydro-Quebec Wind Power

Hydro-Quebec has announced plans to develop 10,000 MW of wind power. The New Nuclear at Wesleyville project is also slated to produce 10,000 megawatts. In a recent media release, the government of Quebec announced "the development of wind power on the territory of the Mi'gmaq of Gespe'gewa'gi, which corresponds to the Gaspésie and eastern Bas-Saint-Laurent." It is estimated that this project of 6,000 MW will require an investment of \$18 billion.

Using the above figures suggests that 10,000 MW of wind energy could be built for about \$30 billion. The costs of the 10,000 MW at the New Nuclear at Wesleyville are magnitudes higher, ranging from \$151 billion to \$238.9 billion.

Admittedly there is a difference between the capacity factor (CF) of wind turbines and the capacity factor of nuclear reactors. Wind turbines are much less efficient than nuclear reactors. However, wind turbine capacities have been increasing as a function of both technological developments and energy storage options. On the other hand, the lifetime capacity ratings of nuclear plants are much less than their announced capacity. If nuclear plants are twice as efficient as wind turbines, it would take twice as much wind turbine capacity to produce an equivalent amount of electricity. In this case Quebec would need 20,000 MW of wind energy to be equal to 10,000 MW of Ontario nuclear energy. Instead of \$30 billion the cost would be \$60 billion. Even if nuclear reactors were three times more efficient as wind turbines, then the cost for 30,000 MW of wind, at \$90 Billion would still be much less than the \$151-238.9 billion cost of the proposed nuclear reactors at Wesleyville in Port Hope.

IESO Renewable and battery storage procurement

In April 2026 the IESO offered 20-year contracts to 14 new renewable energy proposals comprised of 12 solar projects and two wind projects. This was a competitive procurement, part of the LT2(e-1) request for proposals. The IESO reports that it had secured these resources, “at a price 21 per cent lower than the last time contracts were awarded to large-scale renewables in Ontario.”

The renewable projects have a capacity of about 1200 MW. The average price for electricity from the new wind and solar renewable projects is approximately 8.8 cents per kilowatt-hour or \$88 MWh. The costs of nuclear electricity that will be produced by new nuclear plants will be much higher and will take much longer to come on stream.

In June the IESO procured new battery storage capacity. “The new battery storage capacity resources are 36 per cent lower cost than the battery storage procured through the government’s earlier E-LT1...reinforcing the importance of competitive procurements in the energy sector.”

There are no competitive procurements in Ontario’s commitment to nuclear reactors.

IESO Study

In August 2025 the Independent Electricity System Operator (IESO) released a new report: ‘Hybrid Resource Portfolio Equivalency Assessment: Study of the reliability and economics of variable generation and BESS resource portfolios to meet system needs traditionally supplied by dispatchable resources.’

The report is technical and some of its conclusions are buried in the tables, but it has two important findings about the potential for wind, solar and battery energy storage systems in Ontario. They can meet at least 99.5% of Ontario's peaking and base-load electricity needs. And they can do it at a lower cost than new small modular nuclear reactors.

Nuclear produces expensive electricity:

Nuclear plants are very expensive. They take a long time to build. They don't perform as well as expected. They incur costly repairs. They need to be rebuilt before they reach their 'best before' dates. At the end of their life, they need to be decommissioned and that takes decades and still unknown amounts of money. While they operate, they regularly emit radioactive elements such as tritium and their radioactive spent fuel rods need to be securely stored and monitored for thousands of years.

All of this makes the electricity produced by nuclear reactors very expensive. So expensive that private investors are reluctant to put up their own money to build the plants. Instead, the public must pay the bills.

The cost of nuclear electricity is the Achilles heel of the nuclear industry. There is now compelling evidence from a wide range of studies and real-world situations which clearly demonstrates that electricity from solar, wind and storage is much cheaper than nuclear power. In the case of Ontario, the cost comparisons put nuclear at an extreme disadvantage compared to renewables.

Ontario electricity ratepayers are in for decades of unnecessarily high electricity costs. The increases have already started.

In November 2025, the Ontario Energy Board (OEB) applied a 29% increase in electricity generation costs for residential customers. The increase resulted, in large part, from the increasing costs of nuclear electricity. To cushion and offset the price hike the government shifted some of those costs to the tax system supported electricity subsidy. The costs of the province's electricity subsidy programs prior to this recent development were close to \$6 billion annually. The recent increase in the subsidy will drive that number considerably higher with annual estimates at \$8.5 Billion. Even before the latest subsidy the province's Financial Accountability Office estimated that over the 20 years from 2020-21 to 2039-40 the subsidies will cost taxpayers \$118 billion.

The Ontario government in December 2025 introduced a new regulation (O. reg 53/05) which allows OPG to charge Ontario consumers the costs of interest payments prior to the reactors being placed in service.

Before the change in regulations the costs associated with building or refurbishing reactors were charged to consumers when the reactors started generating electricity. The costs would be recouped over the life of the reactor. Now consumers will be charged for some of the costs of electricity long before the reactor is in operation. Given

the demographics of the province some customers will be paying for the costs of nuclear electricity that they will never get a chance to use.

On the heels of that change, OPG requested that the OEB permit a large increase (72.5%) in the price OPG charges for nuclear electricity. It is unclear what the actual impact will be on family electricity bills.

What is clear is that there will be a surge in electricity bills in 2027. It is driven by the nuclear payment amount increasing from around \$111 MWh to about \$207 MWh. And it comes on top of the rate increase of 29% that the OEB announced in November 2025.

If 8-10 new nuclear reactors at Wesleyville in Port Hope and 4 new reactors at Bruce Power are added to the grid, Ontario electricity consumers will be financially exhausted. Ontario electricity customers and taxpayers cannot afford to pay the nuclear bills.

Section 3: Small Modular Nuclear Reactors (SMRs)

In 2018 the federal government, in conjunction with provinces and the nuclear industry, published the Small Modular Reactor Roadmap. This was followed by Canada's Small Modular Reactor (SMR) Action Plan, a plan for “the development, demonstration and deployment of SMRs for multiple applications at home and abroad.” It was a pitch to “lead the world on SMRs.” In 2023 the federal government was predicting a tripling of nuclear energy in Canada by 2050, most of it supplied by SMRs.

The aftermath of the SMR Action Plan was a whirlwind of activity. There were public announcements, dozens of government reports, hundreds of conferences and workshops. There were numerous academic and policy papers, hundreds of grants, changes to tax rules and regulations, and various MOU's (Memorandum of Understandings) among provinces and between governments and industry.

Hundreds of millions of federal tax dollars were given to companies, provinces, universities and crown agencies to translate the promise of SMRs into on-the-ground developments. A recent report ‘Eight years on the roadmap: Assessing small modular nuclear reactors (SMRs) in Canada’ puts the federal figure at about \$275 million, exclusive of the spending on Darlington SMRs.

There were ten SMR designs on the drawing board to be advanced and there was a timetable for the development of three streams of SMRs across the country. The first SMR would be online by 2026 at Chalk River (parent company has since declared bankruptcy). In 2028 Darlington would be producing. New Brunswick would join in by 2030, with the first of two designs. In 2032, Saskatchewan would have an SMR online with three more in dock.

That was then. Now the first SMR (Darlington unit 1) is not scheduled to be operational until 2031 and the rest is even more uncertain. After a lot of public spending the ten SMR designs are no closer to attracting investors. Some have 'paused' their development, some have gone into receivership, some have scaled back their operations in Canada and most want even more public money.

By 2021 four provinces - Ontario, New Brunswick, Saskatchewan and Alberta - had signed an MOU on the development of SMRs. The MOU was followed by a feasibility study and then a comprehensive "strategic plan". Just a few years later the enthusiasm has waned. New Brunswick is backing away from the two SMR designs in the province. In October 2025, the New Brunswick Minister of Energy indicated his reluctance to assume the risks of first of a kind nuclear development. Saskatchewan, while theoretically still committed to SMRs, has pushed the SMR decision back to 2029 and now insists that the federal government pay 75% of the cost of the first reactor to be built in the province. Alberta is still 'exploring' possibilities and signing various MOUs with companies to keep the discussion going. But Cenovus, a large fossil fuel company that was investigating the use of SMRs in the tar sands concluded that SMRs were undeveloped, too expensive and with timelines that were too long.

The provinces which signed on to the SMR MOU have now shifted their attention to large scale reactors. In January 2026 Saskatchewan announced it was formally evaluating large scale nuclear reactors. New Brunswick has announced it is considering large scale nuclear reactors at Point Lepreau. Alberta has announced its 'major project' plans for four large scale nuclear reactors at Peace River.

While the federal government has identified the Darlington SMR as a 'nation building' project and provided \$2 billion in taxpayer support, its most recent nuclear announcement indicates a shift in focus to large scale reactors. After a decade of over-the-top hype about the future of small reactors the federal government is now promoting a fleet of large scale, CANDU reactors.

The bloom is rapidly fading from the SMR rose. In its latest SMR data set the World Nuclear Association lists 133 designs by 88 developers in 21 countries. Only five are under construction.

Ontario stands alone:

Ontario was an early endorser and enthusiastic promoter of SMRs. So much so that the government was prepared to have Ontario electricity consumers and taxpayers foot the bill for an expensive and untested nuclear project. The Minister of Energy was convinced that SMRs would launch Ontario as an "energy superpower." And OPG was willing to take the 'first mover risk': "Because they [SMRs] take too long and the industry needs to see that these things can be built successfully, to give investors the confidence and really get the ball rolling in other jurisdictions."

OPG is planning to build four BWRX 300 SMRs at Darlington. The reactor design is owned by the US based GE Verona. It is the first reactor in Canada that is not Canadian designed. It is the first reactor in Canada to use enriched uranium as a fuel. The enriched uranium will likely be imported from the US and France.

The project, called New Nuclear at Darlington (NNDP), is underway with the construction of the common infrastructure (roads, buildings, etc) as well as the first unit. According to OPG's timetable, the Unit 1 reactor is to come online by 2031 and the final unit in 2034.

Although this is a first of kind nuclear reactor, the Canadian Nuclear Safety Commission did not require an environmental assessment. Instead, it allowed OPG to reuse an impact statement from a more general assessment that was completed in 2011. At that time SMRs were not in the mix.

The projected cost of the four SMRs at Darlington is \$20.9 billion (\$2024). These costs are much higher than initially expected and higher than what industry insiders and independent observers consider necessary to encourage widespread adoption of SMRs. The high cost of SMRs has driven private investors away. Even with massive subsidies from governments, investors are reluctant to ante up.

According to OPG filings with the OEB the estimates "to complete the design, procurement, construction and commissioning of Unit 1, including scope common to the four-unit facility, is \$7.7B including interest, escalation and contingency. "

There are varying estimates for the cost of common infrastructure and the costs of unit 1. The latest figure for unit 1, according to OPG, exclusive of the common infrastructure costs of the four reactors, is \$ 6.5 billion.

That is a staggeringly high price for 300 MW of electricity. Expressed as a cost per kilowatt it works out to \$21,950. That cost is uncomfortably close to the Vogtle costs of \$23,752 kw, the most expensive plant in history. It doesn't take too many delays or cost overruns to have Darlington match or surpass the Vogtle costs.

While those comparisons are not based on comprehensive calculations, they are clearly indicative of the Darlington SMR's high-cost problem.

There are some other equally troubling comparisons. Manitoba has recently announced a plan to build 750 MW of fossil gas fired electricity at a cost of \$3 billion. The plan calls for more than twice the energy output at less than half the cost of Darlington unit 1. Clearly fossil gas plants should not be built because of the climate and health impacts of their emissions. The point here is to show the huge cost premium of nuclear energy. For comparison, a recently completed 377-megawatt natural gas-fired power station in Saskatchewan cost \$825 million.

The current estimate for the Darlington SMRs is \$20.9 billion. Of that, \$7.7 billion will be spent on unit 1 and some common infrastructure for all four reactors. That leaves \$13.2 billion for the other three. All cost estimates for units 2 and 4 are redacted in the OPG filings to the OEB. But there is a public figure of \$4.1 billion for unit 4.

While that is a substantial reduction from the costs of unit 1, the common infrastructure costs haven't been included. The common infrastructure costs have been estimated at about \$1.5 billion. On a straight prorated basis that would amount to \$375 million per reactor. Adding that to the unit 4 cost, increases the initial estimate to \$4.75 billion. Spending \$4.75 billion to produce 300 MW of electricity is bad economics. The International Energy Agency in its recent report 'The Path to a New Era for Nuclear Energy,' while bullish on the prospect for SMRs, cautioned that costs would have to be around \$6,390/kW (C\$) for any widespread adoption. The best-case scenario for Unit 4 in 2034 will be \$15,800/kW. More than twice the target price established by the International Energy Agency.

When the BWXR 300 was first promoted company executives recognized the costs had to be able to compete with alternative energy sources. "The total capital cost of one plant has to be less than \$1-billion in order for our customer base to go up," Christer Dahlgren, a GE-Hitachi executive, said during a talk in Helsinki in March 2019.

The central argument for SMRs is that what they give up in the economies of scale of large reactors they will more than make up for in the economies of series production. SMRs are meant to be built as standardized modules and are expected to shift a good share of the production from the construction site to the factory. It is in serial factory production where the learning curves pay off and costs are reduced.

But from a cost reduction standpoint strong learning requires volume. The costs of FOAK (first of a kind) are expected to be a lot higher than the NOAK (nth of a kind). And the goal is to quickly get to many NOAKs. If only a few are built, as is the case in Darlington, the learning doesn't compound. It isn't sufficient to bring the costs down to where they need to be. With only 4 SMRs to be built the project will be hard-pressed to get beyond First of a Kind (FOAK) risks.

The high cost of the SMRs has OPG and the government of Ontario worried. In December 2025, The Globe and Mail, reported on Ontario Power Generation's "struggle to attract private investors to fund nuclear plants." The Crown Corporation's chief financial officer said that "her company has 'tried many ways' to entice institutional investors to fund the Darlington SMRs, without success."

Given investors' history with the cancelled NuScale SMR project in the US, the exorbitant costs of the Vogtle large scale nuclear plant in Georgia, and the cautionary tale of the nuclear cost overruns that caused the bankruptcy of Westinghouse in 2017, investors are reluctant to assume the risks of nuclear reactors. Financial institutions are happy to collect the interest payments from governments, construction companies are happy to be paid to do the work, nuclear companies are happy to be billing the

government for their reactors, but if any of them had to assume the risks of Darlington they would all be scrambling for an off ramp.

But in Ontario it is public money that is at stake and ratepayers and taxpayers don't have an off ramp. Instead, we have governments already scrambling to manage or at least massage the costs.

The Ontario government convinced the federal government to put \$2 billion of federal tax money into the SMR. In turn the Ontario government put up \$1 billion of direct taxpayer money into the project. OPG has announced that the SMRs are eligible for a Clean Energy Tax Credit from the federal government, another federal tax money handout. In turn, Ontario changed the rules for charging nuclear plant interest costs to consumers. The new regulation (as previously noted) allows OPG to require that electricity consumers pay for the interest well before the plant is even built.

Ontario also shielded ratepayers from some of the recent nuclear-induced increase in electricity rates by shifting part of the charges onto the tax base through the electricity subsidy program. The province also claims it is "exploring potential financial instruments that would benefit ratepayers, and in parallel, OPG continues to explore other optimal financing arrangements."

In the 2025 Ontario budget the government noted:

"The government recognizes that nuclear projects are complex and capital-intensive and is exploring the potential for innovative equity partnership opportunities and ownership models that can unlock private sources of capital for the successful development of nuclear generation projects. By attracting investment from pension funds and other institutional investors, the government's goal is to keep more Canadian energy dollars working here at home."

In June 2026, the federal and Ontario government announced an investment deal with the Williams Treaty First Nations to buy an equity stake in one of the four modular reactors at Darlington. The deal was backed by a loan guarantee from the federal and provincial government amounting to \$715 million dollars.

It doesn't really matter whether it is federal funding, Ontario government funding, electricity subsidies, tax credits, or Indigenous nations equity positions, because none of that lowers the cost. It just divides it up in different ways. The more tax money that is spent on the project the less will be charged to electricity consumers, but from a cost of electricity perspective it doesn't change the real costs of nuclear reactors. The cost of expensive electricity produced by SMRs is paid for by taxpayers and by ratepayers.

Construction has barely begun at Darlington and already the doubts have started. The costs, already high, are likely to climb even higher. The future is not looking bright for the proponents of SMRs. It is looking worse for Ontario electricity customers.

According to a recent Institute for Energy Economics and Financial Analysis (IEEFA) report. “It is becoming increasingly clear that the cost of power from SMRs will be far more expensive than that from renewable energy and battery storage.”

The report goes on: “Finally, it is vital that this debate consider the opportunity costs associated with the SMR push. The dollars invested in SMRs will not be available for use in building out a wind, solar and battery storage resource base.”

In earlier technical and policy discussions on SMRs it was assumed that SMRs provided a base load supply for electricity grids, with the smaller ones ideal for standalone operations in remote regions and associated with mining or oil extraction operations. The tone in the literature and policy papers has changed. It is increasingly recognized that they are too expensive for most standalone operations, and increasingly it is recognized that they are not the best option for base load grid generation. Instead of supplying base load electricity, the emerging view amongst proponents is their role as an add on to grids that are substantially powered by renewables and storage. A recent report by the International Energy Agency makes the case: “The faster deployment of SMRs as depicted in the High SMR Case would complement the rapid growth of variable renewables and reduce the need to expand large-scale nuclear capacity and other sources of firm dispatch-able power. Lower SMR costs could open up the possibility to run these plants more flexibly, while remaining economically viable.”

Judged by the Ontario experience, SMRs will be too expensive to operate more flexibly.

Section 4: Refurbishments of Nuclear Plants

Ontario’s existing fleet of nuclear reactors has suffered a shorter than expected life span. Reactors had to be shutdown, repaired and refurbished earlier than what was forecast by the nuclear industry. As a result, expensive overhauls, now being characterized as mid-life refurbishments, are underway. At Darlington units 1-4 have been refurbished, units 5-8 at Pickering are being rebuilt and units 3-8 at Bruce Power are scheduled to be complete by 2033. When complete the refurbishments will supply about 12000 MW of energy.

There is a confounding problem in the economics of nuclear refurbishments. To begin with they are very expensive energy projects. But then, as reactors are offline for refurbishment there are fewer reactors left in operation. The fewer reactors still in operation produce less nuclear electricity and therefore there are fewer megawatts of nuclear power to carry the overall costs. As such, the charges per MWh of nuclear electricity increases. Consumers are also now charged up front for the huge interest payments associated with nuclear refurbishments. In addition, consumers must pay for the electricity that replaces the offline reactors and that has led to the ramp-up of expensive and climate-wrecking fossil gas-fired electricity plants.

Ontario ratepayers and taxpayers are paying for both the costly refurbishments and the expensive fossil gas that is used to power the grid while the nuclear plants are shutdown. Clearly, this doesn't seem like a good value-for-money proposition.

Darlington

The Ontario government garnered headlines by claiming the Darlington refurbishments were completed ahead of schedule and below budget. But things haven't gone quite that well. It is the case that OPG, in its December 2025 rate application to the OEB, indicated it will not seek any variance above the \$12.8 billion budget for the Darlington refurbishment. But it did announce that additional expenditures were required for the plants. The additional sums required will drive overall cost increases "from \$13,073.9M in 2026 to \$14,712.6M in 2031...., including forecast in-service additions for the Darlington Turbine Rotors Replacement project and several other large-scale, sustaining investments necessary to ensure reliable post-refurbishment performance and address emerging conditions, net of depreciation."

It seems that \$12.8 billion rapidly becomes \$14.7 billion. The original cost included \$2 billion in contingency to "cover the cost of additional risks that might occur during the project". Clearly this wasn't enough. Whether it is 'refurbishment' or immediate 'post refurbishment' expenses those additional costs will have to be paid by Ontario electricity customers and/or taxpayers.

In 2018 the Auditor general conducted a Value for Money review of the Darlington refurbishment. The report notes: "In November 2009, OPG completed a feasibility study that indicated that refurbishing Darlington Station was a more economical solution than other types of energy generation that OPG could have produced (such as natural gas.)"

If that feasibility study was done today it would arrive at different conclusions. In November 2017, the Financial Accountability Office (FAO) released a report on the planned refurbishment of the province's nuclear reactor generating stations. It concluded that the refurbishments would "provide ratepayers with a long-term supply of relatively low-cost, low emissions electricity."

At the time the FAO concluded: "There are currently no alternative generation portfolios that could provide the same supply of low emissions baseload electricity generation at a comparable price to the Nuclear Refurbishment Plan."

The FAO concluded; "Solar is currently, on average, the most expensive generation source in the Ontario." That report is close to ten years old. The decision to refurbish Darlington was made at a time when the costs of renewable energy were high and storage was in its infancy.

Pickering

That is not the case with the current refurbishment of Pickering units 5-8. Now utility scale solar and onshore wind, even with the added expense of storage, are considerably cheaper than nuclear.

The forecasted costs of refurbishing Pickering are more than twice as high as those announced for Darlington. They will be incurred at a time when the costs of renewable energy and storage have plummeted and now provide the cheapest sources of electricity for our homes. The government has announced that to refurbish Pickering reactors 5-8 it will cost an estimated \$26.8 billion. Part of the explanation for higher costs is the simple fact that the Pickering reactors are very old. Geriatric reactors require more extensive replacements of more expensive components. In the case of Pickering that means the steam turbines must be replaced and a longer water intake tunnel has to be constructed into Lake Ontario.

But what makes nuclear so expensive is the cost of capital and the escalation in costs associated with long timelines. According to OPG (OEB exhibit) it will cost \$4 Billion in capitalized interest and \$3.7 Billion as a contingency (which includes an escalation amount of \$1.9 billion). Twenty nine percent of the total cost of refurbishment is expected to be interest and contingency.

In its filings with the OEB, OPG explains that the “Pickering refurbishment is expected to be the most practical and lowest risk solution to meet Ontario's future electricity demands.” It will not be the most economical nor the best for Ontario families paying the electricity bills. The last reactor at the Pickering site is expected to be connected to the grid in 2034. If the trend lines for renewables and storage continue, the Pickering refurbishment will be seen as a costly mistake.

In its filings to the OEB, OPG estimates the levelized cost of energy (LCOE) at Pickering to be \$180 MWh (\$2024) without subsidies, dropping to \$169 MWh with the Clean Energy Investment Tax Credit. This figure is considerable higher than the cost of renewables.

Bruce Power

Bruce Power supplies all its electricity to the IESO on a fixed cost contract and prior to refurbishments supplied about 30% of the province's electricity.

Bruce Power has 8 reactors. Units 1 and 2 were refurbished more than a decade ago. Bruce 1 initially took 8 years to build and was in service for only 20 years before a major refurbishment was required. The plant was idle for 17 years, almost the same length of time it was producing electricity. Unit 2 was a bit quicker to build but it lasted only 18 years before a major retrofit was required. UNIT 2 was off-line for 15 years. The company has indicated that there is possibility of a second refurbishment of units 1 and 2 in the early 2040's.

Units 3-8 are midway through a Life Extension and Major Component Replacement Project with Unit 3 completed in June 2026. The total investment is estimated at around \$13 billion and is expected to be completed by 2033. Bruce power has relied on 'green bonds', private borrowing and more recently public monies through the federal government's Clean Investment Tax Credits.

Section 5: Conclusion

In 2017 the FAO conducted a review of Ontario's nuclear refurbishment plans. At the time the FAO concluded that given the costs of alternative energy sources the refurbishment of Darlington and Bruce made economic sense.

In 2018 the Auditor General conducted a 'Value for Money' audit of the Darlington refurbishment and concluded it made economic sense.

Since then, renewable energy has gone from a costly, emerging technology and nascent industry to one of the fastest-growing industries in the world providing the least cost energy.

If there were reasons to review the nuclear refurbishment program in 2017-18 there are now even more reasons for a comprehensive, independent review of all aspects of Ontario's nuclear program.

It hasn't even been ten years since the previous review and yet the global energy landscape has completely changed. There is now a clear consensus that the future of energy is a future where clean, safe, inexpensive renewable energy---solar, wind and storage---will power the electricity grid, our homes and our transportation.

Ontario is increasingly at odds with this consensus. Ontario is on track to spend hundreds of billions on nuclear reactors at a time when there are cheaper, safer and cleaner energy alternatives.

There are no new electricity generation projects that can compete with the costs of utility-scale solar and onshore wind. Renewables are also quick to build. A solar array or a wind turbine development is producing electricity years before a nuclear plant is even built. That means that in most situations solar, wind and batteries are now the best option for new electricity generation.

Renewables combined with storage are also altering conventional understandings of base load and peak load requirements. The rapid development and deployment of batteries mean that peak load and peak shaving issues can be addressed with batteries or other storage innovations.

Renewables are flexible, modular and scalable. Adding renewables and batteries in small increments can match growth much better than any configuration of small or large

scale nuclear reactors. Increasingly, renewables can provide both base load and ancillary power.

At a time of climate breakdown and extreme weather, renewables also provide the cheapest and fastest way to decarbonize the electricity grid. The UNEP's recent report 'Limiting Overshoot' underscores the point:

“Accelerating the renewable energy revolution is crucial. On the supply side, limited overshoot scenarios suggest scaling renewables to 60-70% of global electricity generation by 2030, supported by grid expansion, storage and demand flexibility.”

Ontario electricity ratepayers and taxpayers are at financial risk. Electricity bills will be higher than they need to be because of costly nuclear reactors. Tax revenues that could fund housing, health and education initiatives will be redirected to subsidize expensive electricity. Tens of billions have already been spent on nuclear projects. There needs to be a Value for Money review of Ontario's nuclear program before hundreds of billions more are committed.