It's Time to TRIPLE Ontario's Renewable Energy.

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ONTARIO CLEAN AIR ALLIANCE

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Introduction

The world is going renewable. In 2024, more than 90% of the world's new electricity supply capacity came from renewable energy sources, mostly solar and wind.[1] Renewable energy now provides more of the world's electricity than coal and nations are racing to take advantage of fast-to-deploy and low-cost solar and wind. Deployment of solar energy increased by a record 30% in 2025. Wind grew by another 8%.[2]

The rise of solar energy has become unstoppable. As the *Ember Global Energy Review 2026* notes, "over the last ten years, solar grew at an average rate of 27% per year, with the annual growth rate never dropping below 21%."[3]

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– Ember Global Energy Review 2026

Meanwhile, nuclear energy's share of global electricity production has fallen from 17.5% in 1996 to 9% in 2024.[4] China, one of the few places currently building reactors, installed 197 times more solar and wind in 2023-24 than nuclear[v]

Between 2024 and 2025 battery prices fell by 45%

But this is just one part of the story. The other is the rise of battery energy storage systems.

Between 2024 and 2025 battery prices fell by 45%, helping drive a 46% increase in global battery installations in the same period.[6] Battery storage paves the way for grid decarbonization by converting intermittent wind and solar energy into reliable 24/7 sources of electricity.

With EV sales rapidly increasing, interest is growing in using EV batteries to provide power back to the grid when it is needed given that EVs are parked on average during 95% of the hours of the day.[7]

Ontario recently contracted for 13 new solar and wind projects, ranging from solar agrivoltaics projects in southern Ontario to a major new wind project near Thunder Bay. The average cost of electricity from these new renewable facilities is 8.9 cents per kWh.[8] That is, less than one-third the cost of power from new nuclear

In 2024, more than 90% of the world's new electricity supply capacity came from renewable energy sources

reactors. The wide geographic distribution of these wind and solar projects is in stark contrast to Ontario's nuclear power facilities, which are concentrated in just two municipalities – the Region of Durham and Bruce County. By investing in solar, wind and energy storage we can produce electricity, stimulate economic development and create good jobs throughout Ontario.

By investing in renewable energy, we can also increase our energy independence and security by reducing our need to import enriched uranium and fossil gas from the U.S. to keep our lights on.

Falling costs for wind, solar and battery energy storage systems have created a golden opportunity for Ontario to shift to low-cost, flexible and quick-to-deploy renewable energy. The result will be lower electricity bills, a more competitive economy, increased energy security and resilience, good new jobs in every Ontario community and immediate progress in reducing climate damaging emissions.

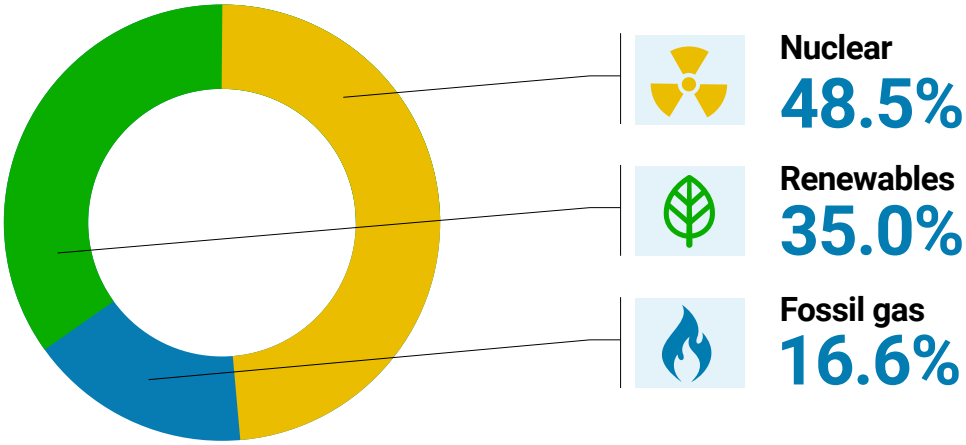
Falling costs for wind, solar and battery energy storage systems have created a golden opportunity for Ontario

Ontario's Electricity Supply Mix in 2024

In 2024, nuclear energy produced 48.5% of Ontario's electricity; followed by renewables at 35% and fossil gas at 16.6%.[9]

Figure 1

Ontario's Electricity Supply-Mix in 2024



Renewables Are Our Lowest Cost Sources of New Electricity Supply

In 2026 Ontario's Independent Electricity System Operator (IESO) signed contracts for new wind and solar electricity supplies at an average cost of 8.9 cents per kilowatt-hour (kWh).[10]

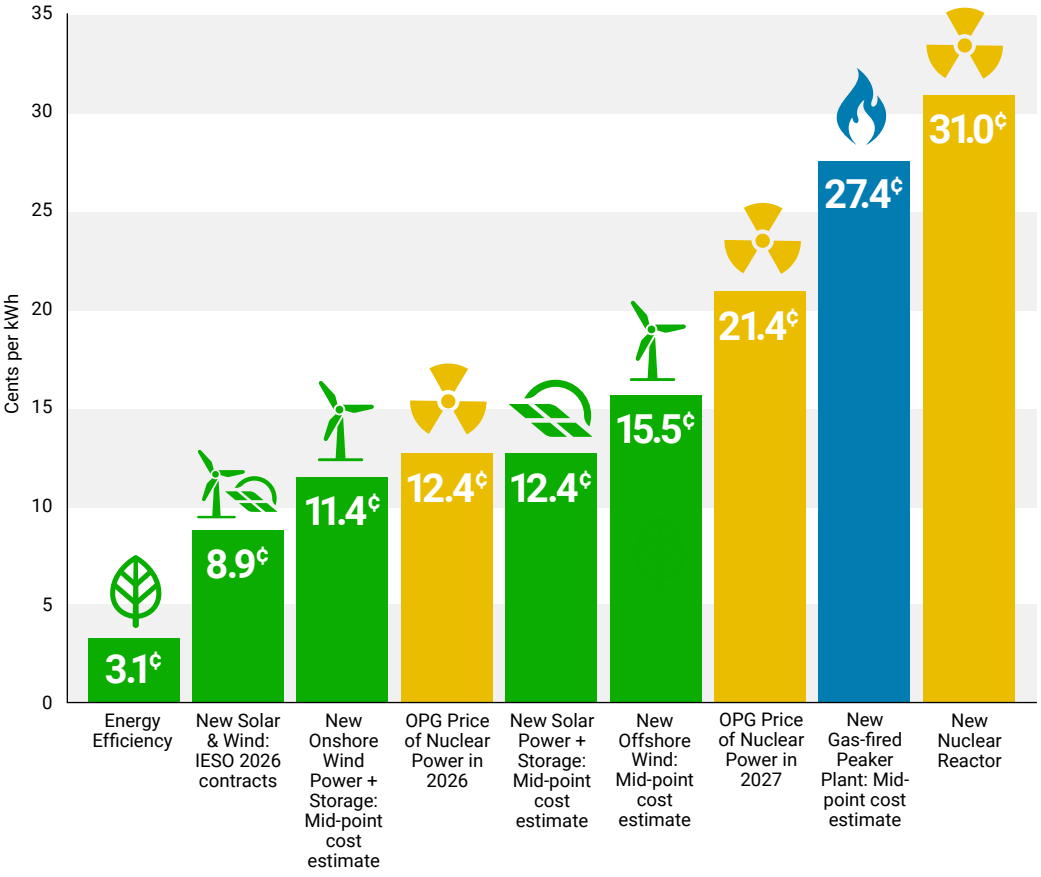
At 8.9 cents per kWh, wind and solar are:

- **30%** lower cost than Ontario Power Generation's (OPG) price of nuclear energy in 2026;
- **60%** lower than OPG's proposed price for its nuclear energy in 2027; and
- Up to **70%** lower than the cost of electricity from a new nuclear reactor.[11]

At 8.9 cents per kWh, wind and solar are up to 70% lower cost than new nuclear

Figure 2

Ontario's Electricity Options: A Cost Comparison[12]



The cost estimate for new nuclear does not include the cost of nuclear reactor decommissioning and the long-term storage of their radioactive wastes.

See Appendix A for references

Renewables Plus Battery Storage Can Provide Reliable 24/7 Electricity at a Lower Cost Than New Nuclear Reactors

Wind and solar, when combined with energy storage, can provide reliable 24/7 electricity.

According to an IESO report, wind and solar energy combined with 4,6,8 and 10-hour lithium-ion batteries can meet 99.5 to 99.98% of our peaking electricity needs and 99.7 to 99.9% of our base-load electricity needs, under all weather scenarios, at a lower cost than new nuclear reactors.

Demand response resources (e.g., shifting some electricity demands from peak to off-peak periods) and/or our existing gas-fired power plants could meet our small remaining electricity needs.[13]

Ontario's proposed new nuclear projects would cost
$400 billion

Table 1

Ontario's Proposed New Nuclear Projects[14]

	Size	Cost
Darlington New Nuclear	1,200 megawatts (MW)	$28 billion
Pickering B Re-Build	2,200 MW	$27 billion +++
Wesleyville	10,000 MW	$230 billion
Bruce C	4,800 MW	$110 billion
		Approximately $400 billion

The total capacity of these projects is 18,200 MW which is 50% greater than the capacity of Ontario's three existing nuclear stations.[15]

According to Ontario's *Energy for Generations* report, if these projects proceed, 75% of Ontario's electricity supply will be produced by nuclear energy in 2050.[16]

Ontario's proposed new nuclear projects do not make sense for the following reasons.

First, they will lead to a dramatic rise in our electricity rates. This will make life less affordable for Ontario's families. It will also make Ontario industries less competitive.

Second, building new U.S. nuclear reactors in Ontario will jeopardize our energy security by requiring us to import enriched uranium fuel from the U.S.[17]

Third, building new slow-to-deploy nuclear reactors will delay the phase-out of our gas-fired power plants. In 2025 more than 19% of Ontario's electricity was produced by burning fossil gas – up from only 4% in 2017.[18] More than 70% of Ontario's fossil gas is imported from the U.S.[19]

Fourth, they will produce radioactive nuclear wastes that future generations will have to safeguard for a million years.[20] Ontario's nuclear wastes are currently stored on the shores of Lake Ontario and Lake Huron. There is no approved long-term storage solution in Canada.

Ontario's demand for electricity will rise by 80% between 2024 and 2050

Ontario's Future Electricity Demand and Supply – A Tripling Renewable Energy Scenario

According to the IESO's reference demand forecast, Ontario's demand for electricity will rise by 80% between 2024 and 2050.[21]

The Pickering Nuclear Station is scheduled to be shut down in September 2026.[22]

The Bruce and Darlington Nuclear Stations are currently being rebuilt. We estimate that they will produce 69.0 terawatt-hours (TWh) of electricity per year in 2035 and 2040; and 57.9 TWh per year in 2045 and 2050.[23]

Assuming the Pickering Nuclear Station is not re-built, no new nuclear stations come into service and gas-fired electricity generation is phased-out by December 31, 2034, Ontario will need to double its supply of renewable energy by 2035 and then triple it by 2050 to keep the lights on (see Table 2).

Table 2

Ontario's Actual & Forecast/Proposed Electricity Demand & Supply: 2024 to 2050[24]

	Actual	Forecast/ Proposed	Forecast/ Proposed	Forecast/ Proposed	Forecast/ Proposed
	2024	2035	2040	2045	2050
Electricity Demand	139.4 TWh	195.6 TWh	219.4TWh	235.2 TWh	250.2 TWh
Nuclear	80.0 TWh	69.0 TWh	69.0 TWh	57.9 TWh	57.9 TWh
Fossil Gas	27.4 TWh	0	0	0	0
Renewables	57.7 TWh	126.6 TWh	150.4 TWh	177.3 TWh	192.3 TWh[25]

Potential Footprints of New Renewables

According to the IESO, Ontario's existing waterpower facilities will produce 39.6 TWh of electricity in 2050.[25] In addition, the IESO is forecasting that virtually all of our existing solar, wind and bioenergy facilities will have come to the end of their economic lives by 2050.[26] Therefore, Ontario will need 152.7 (192.3 – 39.6) TWh of new renewable electricity in 2050.

Solar farms with a footprint equal to 4/10ths of 1% of Ontario's land area could produce 152.7 TWh of electricity per year.[27]

Onshore wind farms with a footprint of 0.78 square km could also produce 152.7 TWh per year.[28]

Great Lakes offshore wind could produce 151 TWh per year[29], with a footprint of only 0.69 square km.[30]

EV batteries can help keep the lights on

In addition to stationary batteries, EV batteries can be combined with wind and solar energy to provide Ontario with reliable 24/7 electricity.

According to the IESO, Ontario will have 6.4 to 8.1 million electric vehicles by 2040.[31]

If Ontario's EVs are combined with bi-directional chargers, they could store surplus wind and solar energy and provide power back to the grid when it is needed. Specifically, by 2040, they could provide 64,000 to 81,000 megawatts (MW) back to the grid when it is needed.[32] That is, by 2040, the capacity of our EV batteries could be more than double Ontario's peak hour demand for electricity, namely, 27,300 to 35,700 MW.[33]

In the U.K., Octopus Energy provides free EV charging to EV owners who agree to provide power back to the grid during peak demand periods.[34]

Similarly, in France, Renault provides free EV charging to EV owners who allow their EVs to provide power back to the grid during peak demand periods.[35]

In addition to stationary batteries, EV batteries can be combined with wind and solar energy to provide Ontario with reliable 24/7 electricity

Action Plan to Triple Renewables by 2050

To double and triple Ontario's supply of renewable electricity by 2035 and 2050 respectively, the Government of Ontario can take following actions.

1	Direct the IESO to establish ambitious annual competitive electricity procurements targets for new electricity supply which will enable Ontario to double and triple its supply of renewable electricity by 2035 and 2050 respectively.
2	Allow Great Lakes offshore wind projects to participate in these competitive procurements.[36]
3	Expand our electricity transmission links with Manitoba and Quebec.
4	Allow renewable energy projects in Manitoba, Quebec and the Martimes to participate in the competitive procurements.
5	Establish a fair market-value standard offer price for rooftop and parking lot solar projects. That is, a fixed price that all small-scale solar projects will receive for electricity that they supply to the grid.
6	Pay EV owners to provide power back to the grid when it is needed.

Conclusion

By harnessing our huge untapped renewable energy potential, we can double and triple our supply of renewable electricity by 2035 and 2050 respectively; lower our electricity bills; increase our energy independence and security; and create good jobs in every Ontario community.

We can harness our huge untapped renewable energy potential to lower our electricity bills

Appendix A

Energy efficiency: Independent Electricity System Operator, *2025-2027 Demand Side Management Program Plan*, (January 2025), page 7.

New Solar & Wind – IESO 2026 contracts: Independent Electricity System Operator, *Long-Term 2 Energy Supply (Window 1) Request for Proposals – Final Results*, (May 8, 2026).

OPG's Prices of Nuclear Power in 2026 and 2027: Ontario Energy Board Docket No. EB-2025-0297, Exhibit I1, Tab 1, Schedule 2, Table 2.

Onshore Wind + Storage: According to Lazard, the cost of new onshore wind + storage is 4.4 to 12.3 cents per kWh (US$). We have converted these costs to Canadian dollars by multiplying them by 1.37. Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 18.0*, (June 2025), page 8.

Solar + Storage: According to Lazard, the cost of new utility-scale solar + storage is 5.0 to 13.1 cents per kWh (US$) We have converted these costs to Canadian dollars by multiplying them by 1.37. Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 18.0*, (June 2025), page 8.

Offshore Wind: According to Lazard, the cost of new offshore wind is 7.0 to 15.7 cents per kWh (US$). We have converted these costs to Canadian dollars by multiplying them by 1.37. Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 18.0*, (June 2025), page 8.

Gas-Fired Peaker Plant: According to Lazard, the cost of a new gas-fired peaker plant is 14.9 to 25.1 cents per kWh (US$). We have converted these costs to Canadian dollars by multiplying them by 1.37. Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 18.0*, (June 2025), page 8.

New Nuclear Reactor: Chelsea Hotaling. Energy Futures Group, *Levelized Cost of Energy ("LCOE") Calculations*, (May 2025), Table 3, assuming Investment Tax Credit at 30%. We have converted the U.S. dollar estimates to Canadian dollars by multiplying by 1.37.

Sources

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4 *World Nuclear Industry Status Report 2025*, page 19.

5 https://www.utilitydive.com/news/nuclear-power-smr-ai-amory-lovins/758660/

6 https://ember-energy.org/latest-insights/global-electricity-review-2026/global-electricity-insights/

7 https://wallbox.com/en/blog/why-bidirectional-charging-is-the-next-big-thing-for-ev-owners

8 Ontario Clean Air Alliance Research, *Ontario's Electricity Options: A Cost Comparison*, (June 10, 2026); https://euzvzapheqq.exactdn.com/wp-content/uploads/2026/06/options2026june10.pdf

9 Ontario Energy Board, *Ontario's System-Wide Electricity Supply Mix: 2024 Data*.

10 IESO, *Long-Term 2 Energy Supply (Window 1) Request for Proposals – Final Results*, (May 8, 2026).

11 Ontario Clean Air Alliance Research, *Ontario's Electricity Options: A Cost Comparison,* (June 10, 2026).

12 Ontario Clean Air Alliance Research, *Ontario's Electricity Options: A Cost Comparison*, (June 10, 2026);

13 Ontario Clean Air Alliance Research, *Briefing Note: New IESO Report on Wind & Solar Energy Combined with Battery Energy Storage vs SMRs*, (Revised January 26, 2026).

14 Georgia Power's Plant Vogtle's reactors #3 and #4 are the most recent new nuclear reactors to come into service in North America. They cost $22,989 per kW (CDN $). We have multiplied the Plant Vogtle's cost per kW by the proposed capacities of Ontario's new nuclear stations to estimate their total capital cost. Ontario Power Generation is forecasting that its Pickering Refurbishment Project will cost $26.8 billion. Ontario Clean Air Alliance Research, *High-Cost Nuclear vs Wind and Solar,* (December 8, 2025); and Government of Ontario, *News Release*, "Ontario Greenlights Pickering Nuclear Generating Station Refurbishment to Create Nearly 37,000 Jobs", (November 26, 2025).

15 The existing net peak outputs of the Bruce, Darlington and Pickering Nuclear Stations are 6507, 3512 and 2064 MW respectively.

16 Government of Ontario, *Energy for Generations*, (June 2025), page 65.

17 Matthew McClearn, "As tensions rise, Canada to lean on U.S. for uranium enrichment", *Globe and Mail,* (February 24, 2025); https://www.theglobeandmail.com/business/article-with-us-tensions-rising-canada-lacks-its-own-uranium-enrichment/

18 IESO, *2025 Year in Review*; and Ontario Energy Board, *Ontario's System-Wide Electricity Supply Mix: 2017 Data*.

19 Ontario Energy Board Docket No. EB-2025-0065: *Enbridge Gas 5-Year Gas Supply Plan: November 1, 2025 to October 31, 2030*, (May 1, 2025), page 50.

20 Nuclear Waste Management Organization, *Choosing a Way Forward: The Future Management of Canada's Used Nuclear Fuel*, (2005), pages 344 and 348.

21 According to the IESO, Ontario's total demand for electricity in 2024 was 139.4 TWh. According to the reference scenario forecast of the IESO's *2026 Annual Planning Outlook*, Ontario's total demand for electricity in 2050 will be 250.2 TWh. IESO, 2024 Year in Review; https://www.ieso.ca/Corporate-IESO/Media/Year-End-Data/2024. *IESO, 2026 Annual Planning Outlook Data Tables*, Figure 21: Energy Adequacy (TWh) – Reference Scenario; https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

22 IESO, *Annual Planning Outlook: Ontario's electricity system needs: 2027-2050*, page 30.

23 The Bruce and Darlington Nuclear Stations have net peak outputs of 6,507 and 3,512 MW respectively. According to the IESO, Bruce Units #1 (818 MW) and #2 (791 MW) are expected to reach the end of their operating lives in 2043. We are assuming that their annual capacity utilization rates in each year from 2035 to 2050 will be equivalent to the Darlington's cumulative average annual capacity utilization rate as of December 31, 2023, namely, 78.6%. *Annual Planning Outlook: Ontario's electricity system needs: 2027-2050*, page 30; and https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=43

24 For actual electricity demand and supply in 2024 see: IESO, *2024 Year in Review* and Ontario Energy Board, *Ontario's System-Wide Electricity Supply Mix: 2024 Data*. We have used the IESO's *2026 Annual Planning Outlook*'s forecast of Ontario's electricity demand from 2035 to 2050. See IESO, *2026 Annual Planning Outlook Data Tables*, Figure 21: Energy Adequacy (TWh) – Reference Scenario; https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

25 See IESO, *2026 Annual Planning Outlook Data Tables*, Figure 21: Energy Adequacy (TWh) – Reference Scenario; https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

26 See IESO, *2026 Annual Planning Outlook Data Tables*, Figure 21: Energy Adequacy (TWh) – Reference Scenario; https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

27 Solar PV systems in Ontario can generate 37.375 million kWh per square km per year. Therefore 4,806 square km of solar PV will produce 152.7 billion kWh per year. Ontario's total land area is 1,076,395 square km. See Allie Pell, Ontario Clean Air Alliance Research, *Ontario's Potential Solar Electricity Generation Fact Sheet,* (May 22, 2026); https://euzvzapheqq.exactdn.com/wp-content/uploads/2026/05/Ontario-Solar-Generation-fact-sheet-may-21-v_02.pdf

28 Onshore wind turbines with a total capacity of 38,910 MW and an average capacity utilization rate of 44.8% will produce 152,700 MWh (152.7 TWh) per year. If each turbine has a capacity of five-megawatts and a footprint of 100 square metres, the total footprint of 7,782 wind turbines will be 778,200 square metres. The IESO's average capacity utilization rate forecast for new Ontario onshore wind turbines in 2030 is 44.8%. See, IESO, *Pathways to Decarbonization*, (December 2022), Appendix A; https://www.ieso.ca/en/Learn/The-Evolving-Grid/Pathways-to-Decarbonization

29 Assuming 34,500 MW of wind power and an annual capacity utilization rate of 50%. Ontario Clean Air Alliance Research Inc., *Great Lakes Wind Power: Now is the Time*, (April 2023), page 5, https://www.cleanairalliance.org/wp-content/uploads/2023/04/Great-Lakes-Wind-Report-apr-17-v_01.pdf

30 Assuming 6,900 five-megawatt turbines, with a lakebed footprint of 100 square metres per turbine.

31 IESO, *IESO Demand & Conservation Planning Technical Paper: Electric Vehicles*, (July 2025), page 7.

32 Assuming the average capacity of EV bi-directional chargers is 10 kW. https://www.power-sonic.com/guide-to-level-2-ev-charging/#:~:text=Charging%20speeds%20for%20Level%20

33 IESO, *2026 Annual Planning Outlook Data Tables*, Figure 2: Net Annual Seasonal Peak Demand (GW); https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

34 https://octopus.energy/power-pack/

35 https://www.mobilityhouse.com/int_en/our-company/newsroom/article/charge-for-free-renault-group-mobilize-and-the-mobility-house-launch-vehicle-to-grid-in-france-while-germany-is-establishing-the-regulatory-framework

36 In 2011 the McGuinty Government issued a news release announcing a moratorium on offshore wind projects. Nevertheless, there is still no legally binding regulation prohibiting offshore wind projects in Ontario. Government of Ontario *News Release*, "Ontario Rules Out Offshore Wind Projects", (February 11, 2011).

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