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The Regional Municipality of Durham
Information Report

From:	Chief Administrative Officer
Report:	#2023-INFO-86
Date:	October 6, 2023

Subject:

Provincial energy sector activities and reports toward a long-term energy planning framework and Ontario's Plan for a Clean Energy Future

Recommendation:

Receive for information.

Report:

1. Purpose

1.1 To provide a summary of provincial energy sector activities and reports toward a long-term energy planning framework including Regional impacts associated with Ontario's Plan for a Clean Energy Future.

2. Background

2.1 Ontario's current long-term energy planning framework is set out under the *Electricity Act*, 1998. It includes requirements for the ministry to publish provincial long-term energy plans with specified objectives and sets procedural roles for the government, the IESO and the Ontario Energy Board (OEB). The Act also provides the Ministry of Energy with the ability to issue implementation directives to the IESO and the OEB to take steps to implement components of such plans.

2.2 On August 10, 2023, the federal government released draft net zero electricity regulations which call for a net zero power grid nationally by 2035. These regulations, once enacted, will help direct provincial electricity system planning in favour of decarbonized sources including nuclear, renewables, and fossil fuel power plants with carbon capture and storage.

3. Previous Reports and Decisions

3.1 The following Regional staff reports relating to Ontario's long-term energy planning framework and related initiatives have been approved by Regional Council:

a. Report #2021-COW-7, Regional Submission to the Review of Ontario's Long-Term Energy Planning Framework (ERO #019-3007)
b. Report #2016-COW-98, Regional Response to Planning Ontario's Energy Future (EBR # 012-8840);
c. Report #2015-J-21, Update on Energy Planning and Energy Sector Initiatives in Durham Region;
d. Report #2013-J-23, Update on Provincial Energy Planning Consultations, Regional Staff Participation and Opportunity for Regional Council Input to the Reviews of Ontario's Long-Term Energy Plan (EBR #011-9490) and Conservation and Demand Management Framework (EBR #011-9614).

4. Summary of Provincial Actions Toward a New Long-Term Energy Planning Framework

4.1 In 2020, Ontario removed the timing requirements for releasing the next long-term energy plan by revoking Ontario Regulation 355/17.

4.2 In 2021, Durham Region participated in information sessions which were part of the Ministry of Energy, Northern Development and Mines' (ENDM, now under Ministry of Energy) review of Ontario's long-term energy planning framework to implement a new, more transparent, predictable and reliable planning process. Several key themes were identified through the Ministry's consultation:

a. The need for clear, high-level government policy direction;
b. The importance of integrated, coordinated planning across energy sectors, especially between electricity and natural gas networks;
c. A focus on expert and independent, agency-led planning;
d. The importance of independent planning oversight, including an emphasis on the role of the OEB as an independent regulator; and
e. The need for enhanced stakeholder and public participation.

4.3 In response to this process, the Ministry:

a. Commissioned the IESO to undertake the Natural Gas Phase-Out Study (October 2021) to explore the impacts on power system cost and reliability in removing carbon emissions from the system in Ontario and the Pathways to Decarbonization (P2D) Report (December 2022) to outline an achievable way to decarbonize the electricity system (summaries provided below).
b. Established an Electrification and Energy Transition Panel to provide expertise and advice to the Minister on:

- How to improve long-term energy planning (e.g., electricity and fuels sectors);
- Improvements to governance (e.g., changes to mandates, regulatory frameworks and performance metrics);
- Reducing barriers to emerging technologies (e.g., low-carbon fuels, distributed energy resources and hybrid-heating solutions);
- Balancing environmental considerations and affordability; and
- Identifying opportunities to advance economic development (e.g., participation in green global supply chains, cross-sector collaboration in energy-intensive sectors).

c. Commissioned a Cost-Effective Energy Pathways Study to assess energy needs across all sectors. The Panel's report is expected to be presented to the Minister in late 2023.

d. Directed the OEB to consult and report back on options to modernize Ontario's regulatory framework to support the energy transition cost-effectively; implement clear guidance to LDCs to enable them to upgrade their distribution systems in preparation for electric vehicle and increased distributed energy resources (DER) adoption; and to report back on distribution sector resiliency, responsiveness, and cost efficiency.

5. IESO's Natural Gas Phase-Out Study Summary

5.1 More than 30 Ontario municipal councils, including the Town of Ajax, endorsed a resolution calling for either the reduction of gas-fired emissions or their complete elimination by 2030. This study is a high-level assessment of the impacts on cost and reliability if carbon emissions were removed from the system.

5.2 The study concludes that decarbonization of the electricity system by 2030 was not technically or economically feasible. Newer forms of supply, such as energy storage, are not ready to operate at the scale that would be needed to compensate for the loss of natural gas generation capacity; nor is there enough time or resources to build the necessary generation and transmission infrastructure to replace natural gas generation within an eight-year timeframe. The effect of removing gas by 2030 would add $100 to the monthly electricity bill of average homeowners, which represents a 60 per cent increase. The report indicates that even with the most optimistic assumptions, without natural gas generation (assuming phased-out by 2030), Ontario's electricity system would see frequent and sustained blackouts to manage energy shortfalls.

6. IESO's Pathways to Decarbonization (P2D) Report Summary

6.1 Two scenarios, namely, a moratorium on new natural gas generation facilities, and a pathway to a decarbonized grid, are presented in the report analyzing potential opportunities and challenges as electricity demand grows and Ontario's resource mix evolves. These assessments are not power system plans but provide insights into potential opportunities and challenges that Ontario faces in addressing future electricity system planning.

6.2 Moratorium on Natural Gas Generation

a. According to the report, a moratorium on new natural gas generation facilities is feasible beginning in 2027 provided that other forms of non-emitting supply can be added to the system in time to keep pace with demand growth.
b. Up to 1,500 megawatts (MW) of new natural gas generating capacity will be needed to meet demand in the mid-2020s.
c. By 2035, once the current nuclear refurbishments are complete and new non-emitting supply enters the system, the system could be less reliant on natural gas generation. Some natural gas generation will still be required post-2035 to address local needs (particularly in the Greater Toronto Area) and to provide the services necessary to reliably operate the broader system.

6.3 A Pathway to Decarbonization

a. This study suggests that attaining a decarbonized electricity sector by 2050 would require aggressive electrification and to more than double the size of the electricity system from 42,000 MW today to 88,000 MW in 2050.
b. This scenario includes a significant increase in transmission capability and contributions from new nuclear, conservation, demand response, renewables and storage including emerging low-carbon generation such as hydrogen and renewable natural gas (RNG).
c. In all, the bulk system expansion needed to enable decarbonization in this scenario would require an investment in the range of $375 to $425 billion.

6.4 The Pathway to Decarbonization Report identified several “no regret” actions that could be taken to help meet growing demand, address retirements of existing generation resources, and ensure a state of readiness to manage any future decarbonization policy:

a. Accelerating current efforts to acquire new non-emitting supply and incentivize energy efficiency, including the implementation of recent conservation and demand management (CDM) directives.
b. Beginning the planning, siting and environmental assessment work needed for new nuclear, long-duration storage and hydroelectric facilities, as well as transmission infrastructure, to allow for faster implementation.
c. Investing in emerging technologies like low-carbon fuels. Further work is needed to determine if they can replace at scale some of the flexibility that natural gas currently provides the system.
d. Galvanizing collaboration amongst stakeholders and Indigenous communities.
e. Ensuring that regulatory, approval and permitting processes are ready to manage future investment at scale.
f. Establishing an open, transparent and traceable process to measure progress and demonstrate the results of decisions and actions taken along the way.

7. Powering Ontario's Growth, Ontario's Plan for a Clean Energy Future Summary

7.1 Ontario's Plan for a Clean Energy Future (July 2023) follows the IESO's Pathways to Decarbonization (P2D) Report and registry consultation. It likewise identifies ten "no regret actions" to meet energy demand through 2050. The actions are listed below along with related press releases, notices and directives:

"No-Regret Action"	Related press releases, notices and directives
New Nuclear at Bruce: Starting pre-development work to site the first large-scale nuclear build since 1993 at the Bruce nuclear site.	The province announced that it is starting pre-development work to site a large-scale nuclear build of up to 4,800 MW at the Bruce nuclear site.
New Nuclear at Darlington: Moving ahead with three additional small modular reactors (SMRs)at the Darlington nuclear site.	The province announced that it will be constructing three additional SMRs (four total) producing 1,200 MW at the Darlington nuclear site, pending regulatory approval.
Building New Transmission: Three new transmission lines to power the conversion from coal to power the Electric Arc Furnaces at Algoma Steel as well as growth in Northeastern Ontario. One new transmission line to power growth in the Ottawa region and across eastern Ontario.	The province launched a consultation to propose an Order-in-Council to make three new transmission lines provincial priorities including a new transmission line between Peterborough and Durham Region by 2029 (either the Cherrywood TS in Pickering or Clarington TS in Oshawa). A fourth new transmission line, the Wawa to Porcupine Line, was recommended by the IESO. The ministry is not currently proposing to prioritize or designate a specific transmitter for this line.
Pumped Hydroelectric Storage: Advancing the Ontario Pumped Storage Project and Marmora Pumped Storage Project to Ontario's first Long-Duration Storage Assessment.	The Minister issued a directive to the IESO to conduct a cost-benefit analysis for the Ontario Pumped Storage Project (TC Energy and Saugeen Ojibway Nation), the Marmora Pumped Storage Project (OPG and Northland Power), and to assess future long-duration storage projects and make a recommendation on whether the Unsolicited Proposals Process is still necessary.

“No-Regret Action”	**Related press releases, notices and directives**
Hydroelectric Power: Optimizing Ontario Power Generation’s hydroelectric fleet to increase generation	In 2022, the province requested that OPG examine opportunities for new hydroelectric development in northern Ontario. The Ministry of Energy asked the IESO to continue engaging with stakeholders on a program to re-contract the province’s small hydroelectric facilities.
Energy Efficiency: Planning for the future of energy efficiency programs in Ontario	In May 2023, the province launched new and expanded Save on Energy programs: Peak Perks residential incentives, greenhouse retrofit incentives, and revised retrofit incentives for businesses and specific regions experiencing grid congestion. The Ministry of Energy began engagement in July 2023 on scoping future energy efficiency and conservation frameworks to replace the current Conservation Demand Management (CDM) Framework.
Next Competitive Electricity Procurement: Starting planning for Ontario’s next competitive electricity procurement focused on new clean resources including wind, solar, hydroelectric, batteries and biogas.	The Minister issued a directive to the IESO to assess the role of new non-emitting electricity resources including wind, solar, hydroelectric, storage and bioenergy and to assess the implications of a requirement in such procurement initiatives that all new electricity generation and storage resources procured would be required to obtain supportive municipal council resolutions before construction as well as a restriction on prime agricultural land. The province announced a trade agreement with Quebec to optimize existing capacity in both provinces.
Integrated Energy Planning: Advancing foundational work toward Ontario’s first long-term integrated energy plan through the Electrification and Energy Transition Panel.	Ontario’s long-term energy plan remains under development. The Electrification and Energy Transition Panel report is expected to serve as the basis for the plan.
Keeping Costs Down: Ontario is cementing its commitment to maintain an	In the report, the province indicates that hydroelectricity and nuclear currently provide the lowest-cost power to Ontario’s grid. While low-carbon fuels and distributed energy resources are

"No-Regret Action"	Related press releases, notices and directives
affordable electricity system to support electrification across our economy.	highlighted as opportunities, the plan frames these as higher-cost options.

8. Regional Impacts

8.1 The environmental, public health and economic costs of climate change are borne by local communities. Durham Region has declared a climate emergency and set greenhouse gas (GHG) emission reduction targets which reflect a strong desire to decarbonize across corporate operations and the community at large.

8.2 The Powering Ontario's Growth report sets no carbon reduction requirements or timelines. Municipal decarbonization strategies depend largely on the investments and initiatives taken by the IESO. With the recently released draft federal Clean Electricity Regulations (CER) to support a net-zero electricity grid by 2035, Ontario's report creates significant uncertainty for the Region in terms of our ability to meet our corporate and community-wide GHG emissions targets by our specified timelines. As the province has noted, it will rely on natural gas generation to maintain system reliability until nuclear refurbishments have concluded and new non-emitting technologies (including large-scale storage) mature and can demonstrate their capability, this may come into conflict with the ambitions of the draft federal Clean Electricity Regulations.

8.3 The Plan remains highly focused on the electricity sector and does not consider the potential of integrated energy systems to support the goals of affordability, resilience and sustainability. As a result, the province is focused on large-scale centralized energy generation including nuclear and hydro. Successful local decarbonization strategies, such as district thermal energy, behind-the-meter renewables (e.g., rooftop solar), microgrids and active transportation can moderate growth in grid-drawn electricity consumption and spark local economic development and energy system resilience. The Region will continue to champion local-level solutions to complement provincial investments.

8.4 The expansion of nuclear generation is recognized as a vital step on the path to achieving a net-zero carbon economy. As a premier centre of nuclear industry, academic research and innovation, Durham Region is positioned to be Canada's centre of excellence for nuclear generation and supply chain, research and development, and deployment of innovative nuclear technology, nuclear waste minimization and fuel recycling. Ontario's plan includes:

a. Potential Refurbishment at Pickering Nuclear Generating Station

- The provincial government is supporting OPG's plan to continue the safe operation of the Pickering Nuclear Generating Station. In June 2023, OPG submitted their official application to the Canadian Nuclear Safety

Commission (CNSC) to amend the power reactor operating license to operate Pickering B through September 2026. Operating Pickering B (Units 5 through 8) beyond 2026 would require a refurbishment. The Ontario government has asked OPG to update its feasibility assessment for refurbishing Pickering B units, which the province expects to receive later this year. If feasible, Pickering B refurbishment could provide more than 2,000 MW of electricity for at least another thirty years. OPG is expected to complete its feasibility assessment and report on the results to the Ministry later this year. Pickering A (Units 1 and 4) is expected to reach the end of life in 2024 and cease operations.

b. Additional Small Modular Reactor (SMR) Units at Darlington

- The Darlington New Nuclear Project is the first grid-scale SMR project in North America. Building four BWRX-300 SMRs at Darlington would provide a total of 1,200 MW of electricity generation capacity, providing enough electricity to power about 1.2 million homes. Moving to a "fleet approach" for SMRs in Ontario (i.e., building multiple units of the same technology) will allow for shared infrastructure (e.g., cooling water intake) and the application of learnings from construction to subsequent units to reduce costs. Construction of the first unit is scheduled to be completed by 2028.

c. The Minister also issued a directive to the IESO to work with OPG and Bruce Power to develop a feasibility study and business case for potential future nuclear generation facilities in Ontario by December 2024.

9. Relationship to Strategic Plan

9.1 This report aligns with/addresses the following strategic goals and priorities in the Durham Region Strategic Plan:

a. Goal 1: Environmental sustainability – Objective 1.1, Accelerate the adoption of green technologies and clean energy solutions through strategic partnerships and investment.
b. Goal 1: Environmental sustainability – Objective 1.4, Demonstrate leadership in sustainability and addressing climate change.

9.2 This report also aligns with the Region's declaration of a climate emergency on January 29, 2020, the Durham Community Energy Plan (DCEP), the Corporate Climate Change Action Plan, and Corporate Energy Conservation and Demand Management Plan.

10. Conclusion

10.1 The Electrification and Energy Transition Panel report is expected to be presented to the Minister in late 2023. Ontario's updated long-term energy plan(s) is expected to follow. After releasing the updated plan(s), the Minister may issue additional directives to the IESO and the OEB. The agencies submit their implementation

plans to the Minister for approval within the timeframe specified by the directive. Once implementation plans are approved by the Minister, the IESO and the OEB move forward with their initiatives as outlined in the implementation plans.

10.2 Regional staff continue to work towards decarbonizing Regional operations and our communities through efforts to support the development and deployment of decentralized systems as well as continued advocacy towards the establishment of additional renewable and low carbon generation capacity.

10.3 Regional staff will continue to monitor for changes to Ontario's long-term energy planning framework and report to Council as required.

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Respectfully submitted,

"original signed by"

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