Driving Decarbonization

Response to the IESO *Pathways to Decarbonization Study*

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Executive Summary

Hydro One is pleased to offer its response to **ERO Posting 019-6647** regarding the Independent Electricity System Operator's Pathways to Decarbonization Study (*Pathways*). Everyday Hydro One delivers safe, reliable, and affordable electricity across its expansive network of distribution infrastructure to nearly 1.5 million customers and its transmission network to virtually every home and business in Ontario.

Hydro One's close relationship to customers of all size provides deep line-of-sight into the importance and potential of electricity to power everyday life, the economic development of Ontario and its future. With this perspective, Hydro One respectfully submits the following observations:

The Energy Transition	The challenges and opportunities are all encompassing. There can be no energy transition without transmission.
Our Clean Energy Advantage	To maintain its advantage, Ontario must streamline and coordinate planning, including adopting a portfolio approach to Environmental Assessments.
Customers First	The priorities of the people and businesses of Ontario must guide policy and decision making.
Modern Grid Requires Modernization	It is incumbent on planners to enable energy companies to start preparing the grid for the operational challenges of the future.
Everyone has a Role to Play	The opportunities will be enjoyed by all or lost by all. Everyone must do their part.
No Regrets	Investments in the short-, medium- *and* long-term are all needed. The underdeveloped role of distribution must be addressed.

Hydro One powers Ontario's economy. We are proud to serve not just our direct customers but all Ontarians through our transmission network. The shift to electrification is happening *now*, and we are helping to power that transition. We will continue to support growing load centres, help build the grid of the future, connect new generation, bolster economic development, and ultimately do our part to enable the energy transition to strengthen the fabric of our society.

> *Hydro One is calling on all policy makers, industry and our utility peers to continue working together through the energy transition. The challenges are too great to approach alone, and the opportunities can only be realized by collectively putting our best foot forward.*

Hydro One, the Independent Electricity System Operator, the Ontario Energy Board (OEB), the government and many other stakeholders are well positioned to work together to identify, plan and invest in infrastructure, and, with advanced metering infrastructure and smart field devices, optimize assets to build an intelligent distribution system. By adopting a coordinated approach, built on demonstrated sector experience, we will optimize the 'on time' build out of the grid required to meet the energy transition, which is important to maintaining affordability. As large and small customers are making decisions now, we need to plan around this early activity to ensure the power is there *when* it is needed, while using economies of scale and early procurement to minimize ratepayer costs.

The time to take no-regret action on short-, medium- and long-term initiatives is upon us. The investments we start making today will unlock successful decarbonization and intergenerational benefits that will flow to all Ontarians.

Chapter 1 – The Energy Transition

The Independent Electricity System Operator (IESO) released the *Pathways to Decarbonization* report in December 2022. The *Pathways* report estimated that to decarbonize Ontario's energy supply by 2050, the province will require an additional 69,000 MW of non-emitting supply and 5,000 MW of demand reductions through conservation. Peak demand is projected to triple, driven by the increase in electric vehicles (EVs) and thermal pumps for heating and cooling.

In the *Pathways* report, the IESO recommends several "no regret" actions to address this challenge – actions that would allow the province to manage all decarbonization scenarios. These actions include:

- Beginning now to plan, site, and perform environmental assessments (EAs) for new nuclear, storage, hydro-electric and transmission facilities, to ensure their faster introduction.
- Ensuring that regulatory, approval and permitting procedures can manage the scale of future investments.
- Stimulating collaboration among stakeholders and Indigenous communities.
- Establishing an open, transparent, and traceable process to measure progress and demonstrate results.

Policy momentum and customer decisions are driving provinces towards a net-zero economy by 2050. The transition to a decarbonized energy supply is the biggest challenge, but also the biggest opportunity that Ontario's electricity system will ever encounter. The energy system is complex and spans multiple subsectors including electricity, oil, and gas. Fortunately, because of an earlier decision to phase out coal-fired generation, Ontario's electricity supply is already one of the cleanest in North America. The province's electricity system is responsible for only 3% of Ontario's greenhouse gas emissions. That is Ontario's clean energy advantage.

The scale of the investments required to decarbonize the province's electricity supply are unlike anything ever seen before in our history. According to the *Pathways* report, decarbonization of Ontario's energy supply will require:

- $400 billion in additional investments in transmission and generation.
- An increase in available land for transmission and generation facilities equivalent to fourteen times the size of Toronto.
- A six-fold increase in the current workforce to build the projects.
- Increased partnerships with First Nation and Indigenous communities.

Hydro One embraces the significant role it has in this transition. Optimization and expansion of the transmission and distribution networks are essential to deliver the electricity required for

economic growth, new supply and decarbonization. According to the *Pathways* report, these include:

- About 10 new transformer stations every year for distribution customers. That amounts, in a single year, to more transformer stations than have been built in Ontario over the last decade.
- Capital investment in the range of $20-$50 billion for new 500 kV and 230 kV transmission lines.

There can be no energy transition without unlocking the full potential of transmission, generation, distribution and customer support.

Through its transmission and distribution networks, Hydro One is the single largest enabler of decarbonization. As the energy transition takes place, further infrastructure and innovation at the distribution level will be required to meet the evolving energy profile at the local level. Hydro One is the connective tissue that will bind our system together by connecting clean supply from Windsor to Ottawa to Northern Ontario and everything in between. Indigenous communities must be included in the planning of new transmission lines and must share in the benefits.

Hydro One believes in a balanced approach to energy transition. Affordability, reliability, and resilience are core features of our mandate. These are the pillars that will underpin the future success of Ontario.

Chapter 2 – Enabling Ontario's Clean Energy Advantage

Building Faster: Integrated Proactive Planning

The traditional approach to planning, permitting, partnering, and building energy infrastructure is no longer sufficient. Planning has been focused on meeting acute regional demand through conservation, generation, and/or transmission. These investments are targeted to be delivered 'just-in-time' with no room for flexibility. The existing situation must evolve. A combination of *short-, medium- and long-term* thinking, bound together by an interwoven and coordinated strategy, is required to address the scale of decarbonization.

The planning process must be renewed to formally acknowledge the following principles: social, economic, environmental, Indigenous participation, and cost recovery. A strictly reactive process that only considers existing demand and cost is insufficient. A holistic balancing of the values important to Ontario must be defined at the outset of planning. These principles can then guide the IESO through all matters of execution. Further, as rightsholders who will be impacted by all new infrastructure, meaningful, early, and ongoing engagement with Indigenous communities is mandatory.

The approval and permitting process for electricity resources must be consistent, streamlined, and dramatically expedited, without compromising the active role of Indigenous communities.

Large infrastructure such as hydroelectric, nuclear facilities and transmission lines can take 5 to 15 years to build. Securing and preserving corridors, land rights, and easements for linear infrastructure such as transmission lines can reduce uncertainty and mitigate costs. Preliminary scoping and development work should begin now so that options are available in the 2030s and beyond. Proponents ought to be able to recover the cost of their investments faster than current rules allow to better enable early development works.

Through the planning process, the IESO needs to identify and advise on priority corridors in the province that link economically viable clusters of generation facilities with economic development zones or centres of demand. This advice can help shape the designation of priority corridors using the best available information.

To ensure infrastructure is ready when required rather than built to respond to growth, the Ontario government should adopt red tape reduction efforts similar to those seen in the *Building Broadband Faster Act*, and the *Building Transit Faster Act*. This would reduce development timelines, streamline approvals, and add focus to community engagements. Indigenous engagement would be made more meaningful if a portfolio approach to Environmental Assessments (EA) was adopted, where one large EA would review all new projects in a region, instead of on a project-by-project basis.

The government should develop an overall, master plan for infrastructure to ensure the future siting needs of utilities such as water, electricity and transportation can be bundled together, where possible, in a single corridor. The value of this has already been proven in the Northwest GTA, where land needed for utilities and a possible transmission line will be part of the corridor for the planned 413 highway. This approach should be replicated for new utility infrastructure. It would be more cost-effective and could help reduce the impact on land and nearby communities.

A coordinated plan for infrastructure should be developed to ensure planning and approvals are in place for the critical infrastructure that will enable the energy transition, such as transmission lines and generation facilities. There should be a master plan of zones and corridors in the province that are expected to be areas of increased economic development or electricity demand. Advance knowledge and planning for these zones and corridors, and the ancillary infrastructure, could be done collaboratively through on-going planning forums or workshops. To accommodate and facilitate the increased upfront development activities for projects, more resources need to be dedicated to consultation, capacity building and Indigenous participation. Additional planning resources and technical studies will be required to support this early engagement.

Streamlined Regulatory Constructs

The province's regulatory framework must provide the right landscape and incentives to enable the energy transition. This modernization should balance the appropriate incentives, cost recovery mechanisms for developers, and increased efficiency from regulators.

Policy conflicts between the OEB and the Ministry of the Environment, Conservation and Parks (MECP) must be sorted out. Presently, when a field study is required for one of MECP's

Environmental Assessments, the proponent must go to the OEB for early-access to the site, instead of getting access to the property through the MECP. It would be more efficient to have these reviews and approvals overseen by one regulator. Further, as noted above, a portfolio approach to Environmental Assessments will also work to streamline regulatory reviews.

In another area of overlap, the OEB approves the EA for any leave-to-construct applications in the natural gas sector, while the MECP approves similar EA applications for electricity. Hydro One notes the approval timelines for natural gas EAs are more efficient than those for electricity. Modernization initiatives in 2022 and 2023 provide a strong starting point. Further review is warranted to investigate how other jurisdictions handle approval-processes, in order to improve regulatory coordination and efficiency.

Cost-Effective Planning for Growth

The *Pathways* report estimates the energy transition will require significant land requirements. The real estate needs will be approximately fourteen times larger than the land area of the City of Toronto. The land will be required for siting new generation facilities and transmission corridors essential for bringing the electricity and zero-carbon energy supply to customers.

The development phase of any project requires numerous project authorizations, including the securing of real estate agreements. The new type of proactive thinking that is necessary for a successful energy transition will allow transmitters and distributors to achieve a fair rate of return when they acquire and hold property today to guarantee that corridors are readily available for construction in the future. The regulatory framework should incent securing corridors in advance to reduce the future costs of acquiring or expropriating the property thus minimizing acquisition time, community conflicts and construction delays.

Giving powers to utilities comparable to those provided to Metrolinx through the *Building Transit Faster Act*, would provide an expedited path towards expropriation where voluntary agreements cannot be reached. Under the *Building Transit Faster Act*, the expropriation process is subject to designated timelines and specific steps that drive efficient project outcomes and enable priority transit projects. At minimum, this same approach should be applied to transmission projects that have been designated priority transmission projects by the Minister of Energy.

With increasing land requirements, all opportunities to leverage existing corridors should be considered, however existing corridors are subject to encroachments and incompatible uses. The Canadian Energy Regulator introduced Damage Prevention regulations to protect pipeline corridor lands. These regulations recognize that designated assets require protection and that unauthorized activity within the corridor lands pose a risk to public safety and economic good. The regulations use a safety clearance zone of 30 meters to limit and restrict activities to those that are necessary for the safe operation and maintenance of the infrastructure.

Encroachments are a notable impediment to project development in transmission corridors, and significant consideration is required to assure their successful removal. A regulation empowering the swift removal of encroachments, with protection against contesting actions,

will notably protect the delivery timelines of projects, while promoting the efficient use of existing assets.

> The Parkway Belt West Plan is Ontario's first provincial land use plan, originally created in 1978 by Order-in-Council under the authority of the Parkway Belt Planning and Development Act, 1978. There were 2 general land use designations in the Plan: (1) Public Use Areas: Mainly for infrastructure (Utility, Electric Power Facility, Roads, Inter-Urban Transit) and open space; (2) Complementary Use Areas: Mainly for uses that help preserve open spaces and encourage agricultural, recreational, and institutional land uses.
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> The Plan was successfully used over the years to protect transportation and utility corridors for projects that were planned for (e.g., Hwy 403, Hwy 407, transitway corridors, hydro corridors) and most of which were built decades ago.
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> ***Source***: ERO Posting, MMAH, December 20, 2022, https://ero.ontario.ca/notice/019-6167

Labour Requirements

Net-zero goals and aspirations are not unique to Ontario or Canada. Ontario is and will continue to compete with others for resources and labour. The *Pathways* report predicts the province will require a six-fold increase in the workforce to build the projects. This figure does not include the labour needed to support expansion and evolution in Ontario's distribution grid.

A pro-active approach is required. Ontario, like many other jurisdictions, is faced with skilled trade labour shortages. Detailed research must be undertaken to identify the resourcing requirements for energy transition years in advance. This effort must extend across the spectrum of labour needs from clerical and construction staff to the need for additional professional, technical, and managerial workers. Focused and early outreach will be critical; employers will need to reach out to students beginning at the middle school level, as well as targeting local communities. Proactive outreach on careers in trades opportunities should start at the elementary, middle school and high school levels, as well as targeted engagement with local communities and groups such as Indigenous communities, new immigrant networks, and the unemployed and underemployed. Barriers that prevent the hiring of foreign-trained professionals and the recognition of their credentials need to be addressed.

Early consultation with union partners will be essential, particularly when multi-year apprenticeships are required. Breaking down barriers to recruitment and retention, including the removal of systemic barriers for underrepresented groups (notably, women, visible and non-visible minorities, Indigenous peoples) must be top-of-mind. Joint efforts between employers and unions to eliminate workplace harassment and discrimination and ensure a respectful and psychologically safe work environment should be priorities. Governments should recognize that additional funding for apprenticeships is another way to spur economic development.

Given that Indigenous participation is integral to the energy transition, strengthened partnerships with local Indigenous communities will promote employment in a previously underutilized category.

According to BuildForce Canada's 2023–2032 Construction and Maintenance Looking Forward report for Ontario, labour market challenges are projected to continue across Ontario's construction industry into the near future, as ongoing activity in both the residential and non-residential sectors builds employment to a peak in 2028 and adds pressure to already-tight recruiting conditions.

Pressures include an aging construction workforce and the expected retirement of 82,600 workers, or 18% of the current labour force over the next decade. All industries will be competing for a shrinking pool of youth over the coming decade, with the share of people aged 15 to 25 years who are about to enter the workforce declining from 12% in 2022 to 10% by 2032. Meeting labour demands will require a combination of industry strategies that include increased local recruitment and training, and attracting immigrants and workers from other industries, and potentially out-of-province workers during anticipated peak periods.

Chapter 3 – Customers First

The *Pathways* report does not consider the potential for local distribution systems to support decarbonization. Rather, the report was focused on the province's bulk electricity system of generation and transmission. Hydro One strongly believes that new investments, technology and/or innovative solutions at the distribution level can provide cost-effective opportunities that defer investments in bulk generation and any expansion of distribution and transmission systems, while increasing the reliability and resiliency of supply to local customers.

Hydro One has a direct relationship with, and distributes electricity to, almost 1.5 million homes and business across Ontario, making it the principal electricity distributor in the province. These relationships give Hydro One deep insights into customer values, needs and preferences. The size of Hydro One's territory and customer base provides us with the ideal opportunity to demonstrate the benefits, in terms of economic efficiency, reliability and resilience, of investing in a modern and intelligent distribution system, including the use of distributed energy resources (DERs).

Strategic Investments & Prudent Innovation

Ontario's distribution system is changing. What used to be a simple delivery of electricity from a transmitter is evolving into a network that provides new methods of generating electricity, particularly at the local level, as well as new services for customers. The end-user will drive the energy transition, and their participation in the transition may provide an opportunity to bend the cost curve. The direct access that distribution companies have to their customers provides a valuable window on customers' choices, preferences, and sustainability goals.

The OEB should build on its recent report, *Framework for Energy Innovation,* and provide clarity about its regulatory treatment of new and innovative technologies, including DERs and the optimization of transmission-level storage.

Building out a Distribution System Operator (DSO) model is a prerequisite to optimize our network and facilitate the adoption of more DERs. This requires intentional and concerted action in the short-term. A conglomerate of Ontario's largest distribution companies would be

best-suited to lead the discussion and provide guidance on creating a made-in-Ontario framework.

To attain the benefits that distribution companies can have on energy transition, investments must be made now into intelligent grid technologies that provide greater visibility and control over assets connected to the system can help the utility to optimize existing capacity on the system and provide avenues for customers to manage electricity consumption and mitigate their costs. Converting existing poles and wires into a "dynamic" distribution system not only optimizes existing assets but allows more choice in services and the ability to maximize the value of customer-owned assets.

> The power system is built to accommodate peaks, which occur for only a limited number of hours per year. Peak shifting mitigates the impact of peak energy consumption by pushing it ahead until the electricity system can supply it. From a bulk power system perspective, it may be accomplished with the use of distributed energy resources or energy storage, or demand-side incentives. At a significant enough scale, peak shifting may defer the need for some new generation and/or transmission.
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> Vattenfall, a Swedish utility, is participating in a pilot project – *Coordinet* – to deploy flexible distribution solutions to supply and demand to alleviate constraints in high-voltage system.

Investments in Hydro One's transmission and distribution networks are low-risk and highly effective – they are supported both by proven technology and a proven ability to execute. While innovative technologies such as hydrogen fuels are promising, these must be developed cautiously, with an eye at all times on the primary objects of reliability and affordability.

Focus on Affordability

Side by side with the government, we must continually and transparently monitor cost pressures for electricity customers. Distributors need to invest in "cautious innovation," while staying connected with what customers expect from the energy system. Historically, renewables and distributed energy resources have a short lifespan of about 10-20 years and would need to be replaced during the energy transition. Large and longer-lasting investments in transmission and distribution could be smoothed out over time to help prudently manage costs to customers.

The government should collaborate with distribution utilities to help customers understand the energy transition and the changes to their "total energy cost." This would highlight the savings they see from the reduced use of natural gas and other fossil fuels, balanced with critical investments needed to expand the electricity system.

Chapter 4 – Cornerstones of Modernization

Transmission is foundational and unlocks decarbonization; there can be no transition without transmission. Not only will new transmission lines bring clean energy supply from Bruce Power and Ontario Power Generation (OPG), but it can increase the electricity the province imports from Quebec, Manitoba, and the three American states of Minnesota, Michigan, and New York.

Hydro One will play a key role in the successful transition to a decarbonized energy supply. It is a market leader in Ontario's transmission and distribution sectors. Its large customer base is a representative cross-section of the entire Ontario market, with residential customers, small, medium, and large industrial customers in rural, suburban, and urban communities across the province.

Hydro One also has a proven history of successful construction of transmission and distribution grids and is proud of the optimized, intelligent distribution systems it operates. It has also delivered efficient and streamlined rollouts of energy efficiency and conservation programs across its entire customer base.

Transmission

Policymakers must be clear sighted about the challenges of the energy transition. Given the scale of this transformational opportunity ahead of us, and the long timelines for new construction, investments must be made sooner rather than later. Proactive, definitive investments in transmission are needed. These investments will bolster economic development while eliminating bottle necks by preparing for demand growth before it manifests.

Hydro One transmission projects are subject to market and competitive forces and provide tremendous value to the Province of Ontario and ratepayers. For example, over 80 per cent of the cost of the Bruce to Milton transmission line was subject to competitive tendering processes and/or market forces. The OEB also subjected it to a rigorous review for cost prudency. Hydro One has also demonstrated our ability to partner meaningfully with Indigenous communities, municipalities and stakeholders through the development, construction, and operations phases of transmission projects.

The energy transition is not a time for uncertainty, piecemeal investments or piloting risky processes. As with neighbouring jurisdictions, clear signals need to be introduced to promote definitive, timely and cost-efficient investments, including:

- Cost-recovery mechanisms for early-stage planning involved in the development of potential transmission projects.
- Integration between developers and planners creating forecasts clarifying early recommendations of which transmission options to study.

Planning and route designation must take place earlier than is currently being done. This will require earlier commitments of capital and needs a greater certainty of cost recovery. To drive lifecycle efficiency, incumbents operating within their service territory should have right of first refusal when new transmission lines are needed.

All levels of government need to coordinate the development of new infrastructure corridors that bundle together transmission and telecommunications lines, highways, and federal-provincial railways. These corridors should be designated and approved in advance, to reduce costs and expedite construction when the energy needs arise.

Regulatory and Planning Improvements

The OEB and the IESO need to streamline their permitting and approvals. The IESO should promote and support activities that allow for the earlier planning of transmission routes and solutions. Among the tangible benefits, this proactive approach would see an earlier start to the project's Environmental Assessment. Where there are several projects being considered for the same region, the IESO should provide support for a regional EA that considers the energy needs of the entire region, including nearby projects, and a project's subsequent phases. This clarified definition of "need" would have an added positive impact in other areas of regulatory processes.

For example, the IESO could accelerate the third phase of the Waasigan and the second Longwood x Lakeshore projects to enable the overall objectives of *Pathways*. Direction now to commence EA activities for the subsequent phases of these projects would eliminate duplicative consultations in the same area. This will reduce time, costs, and confusion to the process without sacrificing any of the benefits of consultation.

In order to reduce project costs and expedite the delivery of project, the Province should designate more Bill 58 lands.

Further value can be derived from updates to the OEBA that allow for cost-recovery of early development activities if the need (as defined by the IESO or designated by the province) does not materialize.

Building and permitting new, large-scale infrastructure is complex and lengthy, as shown by the most recent expansion of Ontario's transmission system.

The 2010 Long-Term Energy Plan identified a new transmission line between Wawa and Thunder Bay would be needed by 2016. Following a competitive process, Upper Canada Transmission, *d.b.a.* NeXT Bridge, was awarded development work for the line in 2013. Following delays, approval was granted in 2019. After 3 years of construction, the transmission line was finally energized in 2022 – close to 12 years after it was first identified.

Chapter 5 – Partners for Success

Hydro One is an industry leader in community engagement and partnerships. Early, respectful, and positive engagement is essential to develop large-scale infrastructure.

Indigenous engagement is a major component of Hydro One's practice. It has already recognized the key role Indigenous communities will play in the energy transition, offering First Nations 50 per cent equity partnerships in any new transmission projects costing more than $100 million.

But there are barriers to successful Indigenous engagement. The government should consider changing how it manages its duty-to-consult responsibilities. Minimum timelines also need to be legislated for defining the Indigenous communities that require a duty to consult, and the Crown should provide clarity on the scope of the duty-to-consult obligations within 30 calendar days of being asked the information.

Competitive transmission outcomes adds complexity to the duty-to-consult process and delay the delivery of necessary transmission and generation. If the government intends to continue with the competitive procurement of transmission, it should consider the impact this will have on its duty-to-consult. The current policy can end up delaying the delivery of necessary transmission and generation. Further commentary and consultation with interested and affected parties is required to understand the effect of this policy change.

Chapter 6 – No Regrets Recommendations

The shift to electrification is happening now. Hydro One is actively working on powering the energy transition. Our investments in Ontario's transmission and distribution system are the first step to enabling the energy transition for all Ontarians. We are supporting growing centres in increasing demand, regional economic development, and generation.

To enable a timely and smooth energy transition, Hydro One supports the following no-regret actions:

Transmission	1. Enable the timely expansion of transmission that fosters economic development and ensure that transmission lines are available when needed. 2. Efforts, with clear cost recovery, should be directed towards initiating appropriate upfront work that is necessary for "on-time" delivery. Based on anticipated system priorities, a graduated approach should be adopted to enable the pre-requisite solution, ranging from initial system feasibility assessments to early engagement work, to structured development and project definition work. 3. A coordinated and integrated regional basis should guide these priorities, with clear signals to identify priority projects.
Distribution	4. Build a DSO model to enable and optimize DER investment. 5. Encourage distribution utilities to invest in enhanced capabilities to enable the future "dynamic" distribution system. These investments will enhance grid visibility and control, enable flexibility, and facilitate greater consumer choice. They will also provide a platform to avoid or mitigate more costly bulk level investments.

Regulatory Modernization	6. Streamline permitting and approvals and allow earlier recovery of costs necessary to enable the energy transition.
Customer Support	7. Continuously review the “total cost” picture, focusing on a reasonable pacing of investment over time to eliminate bill spikes. 8. Work with the energy sector to establish the full cost of the energy transition, including distribution costs – this analysis will help consumers see their “full energy costs,” including future reductions in usage of hydrocarbons.