

ONTARIO ENERGY ASSOCIATION

SUBMISSION TO ELECTRIFICATION AND ENERGY TRANSITION PANEL

JUNE 30, 2023

To shape our energy future for a stronger Ontario.



Ontario Energy Association

ABOUT

The Ontario Energy Association (OEA) is the credible and trusted voice of the energy sector. We earn our reputation by being an integral and influential part of energy policy development and decision making in Ontario. We represent Ontario's energy leaders that span the full diversity of the energy industry.

OEA takes a grassroots approach to policy development by combining thorough evidence based research with executive interviews and member polling. This unique approach ensures our policies are not only grounded in rigorous research, but represent the views of the majority of our members. This sound policy foundation allows us to advocate directly with government decision makers to tackle issues of strategic importance to our members.

Together, we are working to build a stronger energy future for Ontario.

EXECUTIVE SUMMARY

The Ontario Energy Association (OEA) appreciates this opportunity to provide input into the Electrification and Energy Transition Panel (EETP). The OEA views the work of the EETP as critical to ensuring that all Ontarians maintain access to affordable, reliable, resilient, and sustainable energy as the province goes through its energy transition.

While this paper provides background on a range of issues related to Ontario's energy transition, the OEA recommends the following priorities for the Panel:

- **Strengthen Ontario's Energy Planning Process**

Ontario needs to provide clear direction and prioritization to energy sector participants, customers, and investors on how it intends to approach energy transition and allow the market to begin to align and provide solutions in-sync with that ambition. We are in competition with jurisdictions around the world for the resource and human inputs to the energy transition, which includes the people and companies with the skills necessary to help us optimally transition Ontario as a smart place to work and live.

The OEA believes that the EETP needs to provide clear direction to the government as to what enhancements to existing governance structures are necessary to ensure we can deliver on the above noted objective. To that end, we recommend the EETP:

- Indicate which organization(s)/body(ies) should provide a broad and comprehensive energy (electric and fuels) plan for the province, which may get updated regularly.
- Promote coordinated energy planning that will analyze all resources - electricity generation, natural gas, energy efficiency, DSM/CDM, hydrogen, geothermal, petroleum, etc.
- Encourage energy planning that values system resilience, reliability, and customer choice, and includes a role for the competitive market.
- Expand the OEB's mandate to include a review of electricity generation planning and procurement. The review should be appropriately scoped to ensure that the review does not become burdensome and inhibit timely decision making. The review should be structured as a test of reasonableness, as opposed to correctness (which undermined the Integrated Power System Plan) with elements such as the:
 - Planning assumptions;
 - Approach to stakeholder engagement;
 - Steps taken to incorporate stakeholder feedback;
 - Procurement options considered; and
 - Broader provincial policy objectives.

- **Expand the Mandate of the OEB**

The current OEB regulatory framework is well suited to help us through this time of decarbonization and modernization of our grids and energy systems when regulatory stability is desirable more than ever. Evolutionary (not revolutionary) change of known and well-understood regulatory mechanisms is, in the OEA's view, an appropriate and suitable place to regulate the journey to net zero.

However, the OEA believes that right now the OEB does not have a clear mandate necessary to enable the types and scale of investments necessary for energy transition. As currently structured, the OEB is not required to apply this broader societal lens to the investments' utilities need to make to enable transition. Without change, the OEA remains concerned that the foundational investments required for transition will get rejected in OEB processes which by and large operates solely as a traditional economic regulator - evaluating investments based solely on short term local benefits rather than on society's clear direction to undertake energy transition. Examples of necessary investments include grid modernization and alternative fuels.

The EETP should build on the advantage of our regulatory system and recommend that the mandate of the OEB be expanded to include emissions reductions in-sync with provincial government ambition and policy.

- **Invest in Low-Carbon Gases**

There are some areas of the economy where electrification may not be practical as an emissions reduction strategy. Some sectors, such as heavy transport and industries with high temperature processes may require alternatives. Additionally, there is a significant opportunity to leverage low-carbon gases to support reduced emissions in building heating. The EETP should recommend:

- Establishing medium and long-term supply targets for hydrogen,
- Expanding the regulatory oversight of the OEB to include hydrogen, hydrogen-derivatives and the associated supply, transport, and storage infrastructure,
- Developing an OEB regulatory framework for hydrogen and its supportive infrastructure,
- Binding medium and long-term renewable natural gas (RNG) blending targets,
- Allowing hydrogen and RNG costs to be recovered at the respective market prices of hydrogen RNG, not natural gas, and
- Recognize book and claim reporting under the Emissions Performance Standards (EPS) which would allow RNG delivered through the gas delivery system to be subtracted from the annual Greenhouse Gas (GHG) emissions

of EPS participants, where the purchase contract clearly demonstrates ownership of the environmental attributes.

- **Articulate a Vision for LDCs: Enable Grid Modernization and DERs**

The Independent Electricity System Operator’s (IESO’s) Pathways to Decarbonization (P2D) study outlined the dramatic increase required in the bulk electricity system that is required for energy transition. However, the IESO indicated in its report that, given its mandate, the report “does not consider the impact on local distribution systems.”¹ Given that the IESO has indicated it does not have a mandate, the EETP must step in to declare how we fill this gap in our electricity system planning. Dramatically increasing the size of our bulk electricity system, without considering the needs of the distribution system, is not an appropriate approach to planning. Questions need to be answered about the scale and timing of a distribution system required to allow unabated access for all electricity customers. Most importantly, failure to consider the distribution system in planning will result in higher costs for customers as opportunities for system optimization will be missed. Cross-visibility in the planning process between gas and electric utilities will be required as new grid edge technologies such as batteries, storage, and hybrid heating/cooling are adopted and implemented.

Beyond keeping up with the increases required to maintain the bulk system capacity doubling or tripling, the types of investments made in the local system will determine the extent to which customers can participate in the transition. Grid modernization investments will help offset the cost of the system by enabling Distributed Energy Resources (DERs). DERs can reduce the need for transmission and traditional distribution infrastructure, as well as grid-scale generation assets. Perhaps most importantly, they do not require decade-long lead times or 40-year contracts to deploy, which avoids risk of delays, cost overruns, and stranded assets inherent in building large capital-intensive projects. The right investments can unlock significant new potential in our electricity system. We need to begin making these foundational investments immediately.

The EETP should articulate a clear vision for the LDC and its role in enabling an affordable and reliable energy transition for Ontario. The Panel should recommend that “distribution activity” definitions be expanded to allow LDCs to become Distribution System Operators to enable DERs, and to become Load Serving Entities (LSEs), so Ontario can move beyond having a single load serving entity that limits competitive options for sector participants and customers.

The utility of the future needs to have stable, predictable access to a significant expansion of capital to prepare for electrification and ensure the grid remains resilient. The utility will need to be allowed to evolve to provide new grid-edge services to meet

¹ IESO. *Pathways to Decarbonization*. December 15, 2022. p. 7.

both customers' needs and expectations, and system optimization goals. This will require a fulsome review of the governance of utilities to ensure that they have the tools and flexibility necessary to achieve this outcome.

- **Role for Transmission**

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. In general, the expectation is that greater transmission assets will be required to enable localized/regionalized assets and resources to participate on a provincial basis. These investments are necessary to ensure system efficiency, to enable lowest cost resources to participate, and ensure Ontario's economic growth. Ontario must evolve its planning beyond "just in time" and plan proactively to secure and preserve the corridors, land rights, and easements to ensure we can deliver an efficient system.

- **Expand Energy Efficiency and Demand Management**

The OEA expects the pathways analysis being undertaken for the EETP will clearly show energy efficiency and demand management as some of the most cost-effective tools to help Ontario transition its energy system. The definition of demand side management programs will need to be expanded to include programs focused on incenting the uptake of efficient/beneficial electrification technologies, distributed energy resources and dual fuel technology such as air source and geothermal heat pumps, hybrid heating systems, as well as managed or smart EV charging. The same result has been found in pathways analysis in other jurisdictions.

The Panel should recommend that energy efficiency and demand management programs ramp up as quickly as possible. This strategy should leverage the customer relationships Ontario's utilities have to maximize reach, engagement, and achievement. This should include leveraging and expanding Enbridge's leadership in DSM and restoring a meaningful role for LDCs in supporting and delivering energy efficiency and demand management benefits at both Provincial and local levels.

Coordination between Enbridge's DSM programming and the IESO's CDM programming is needed to optimize energy savings and GHG emission reductions. Policy considerations, funding sources, and coordination policies should be established to ensure reliable energy system capacity. The OEB's involvement is crucial in developing an effective and resilient pathway for GHG emissions reductions.

- **Establish a Regulatory Framework for CCUS**

A number of industries in Ontario will be dependent on carbon capture, utilization and storage (CCUS) to meet emissions reductions objectives, like cement and fertilizer

producers. The EETP should recommend that the necessary steps are taken to enable CCUS in Ontario, including development of:

- A streamlined permitting regime for approving CCUS projects. This should include a permitting process that encourages commercial-scale CCUS project; and
- Piloting of CCUS projects to demonstrate the feasibility of CO₂ collection, transport, and storage.

- **Affordability**

Our progress on the path to net zero will fail if we do not maintain customer affordability. If affordability impacts are too significant, not only will the process lose voter support it will cause financial hardship for families and businesses.

Integrated, proactive, staged planning is critically connected to ensuring we are on an affordable pathway. The OEA believes that its recommendations, as outlined above, will ensure Ontario finds the most affordable path possible that still meets societal objectives for reliability and sustainability.

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INTRODUCTION

The Ontario Energy Association (OEA) is pleased to provide its input to the Electrification and Energy Transition Panel (EETP). The OEA believes that the EETP has been given an excellent opportunity to support the province in developing a more reliable energy planning process as it offers guidance on the decarbonization of the province's energy needs. While Ontario is on track to meet its 2030 emission target of 30% below 2005 levels, achieving net zero requires more investment in non-emitting electricity generation, lower emissions fuels, and carbon capture.

To meet the affordable, reliable, resilient and lower emissions energy needs of the future at the lowest cost, all energy sources must be factored into a holistic plan to demonstrate the complementary roles each energy source can play. Any changes proposed to enable a new planning framework must recognize the importance of reducing emissions of the province's existing energy infrastructure in the most cost-effective manner. Therefore, the EETP and the government should set policy objectives and be agnostic as to the technologies and energy sources that can deliver on those goals cost-effectively. In addition, to better integrate commonly used existing energy sources, the EETP has an important opportunity to better integrate and enable low carbon opportunities including non-emitting electricity generation, demand response, geothermal, hydrogen, renewable natural gas (RNG) and carbon capture utilization and storage (CCUS).

Achieving a net-zero energy system in Ontario requires a shift from planning in a traditional stable linear manner, to multi-variate planning. Energy system planning must determine how to achieve emissions reductions targets without overbuilding, stranding assets, or compromising reliability, resiliency, and affordability. The OEA recognizes concerns about building too early creating unwanted rate impacts; however, building too late is worse because the grid needs to be there when customers need to plug-in. Consumer choice and policy decisions will shape the pace of transition - the pace of adoption of new technologies (e.g. EVs / heat pumps), new generation sources (e.g., central generation, DERs) and gains in efficiency will be a function of consumer preferences, prioritization, innovation, global supply chains, and policy choices made at all levels of government.

There are no-regrets investment available now that are necessary to enable any net zero pathway/scenario. Failure to make these investments may put base requirements (safety, security, reliability, and resiliency) at risk. These include investments in both physical infrastructure and human capital.

ROLE OF THE PANEL

The EETP can provide tremendous value for the energy transition in Ontario. Its greatest value comes from its independence. Each of the panelists are highly respected, independent of government, with very relevant expertise. Energy transition discussions can be contentious: there will never be a full consensus on the optimal transition pathway. In addition, over the course of our path to net zero, there will be changes in political parties, Cabinet Ministers, and perspectives at the federal, provincial, and municipal levels. Finally, over the course of the transition, there will be changes in voter and customer perspectives based on their experiences in the energy system. Ontario needs independent and pragmatic recommendations from the EETP that can set us on a transition path that deliver on affordability and reliability and can be sustained through shifting political environments. The more certain the environment is in Ontario, the more we will be able to attract and retain the investments in human and financial capital required for transition.

The OEA recognizes that the EETP will face significant pressure from a broad array of stakeholders to tackle and make recommendations regarding a wide array of issues of longstanding concern. There is no doubt, that given the proliferation of electro-technologies and supply and demand side resources, that Ontario's low emitting electric system and electrification will play a key role in decarbonization. However, the ultimate-goal of the EETP is to ensure we capitalize on an evolving opportunity/challenge/need to transform current energy infrastructure (electric, natural gas and transportation fuel) and optimize energy system functionality related to cost, reliability, and sustainability. Therefore, we believe it is important that the EETP prioritize and focus on the key energy transition issues facing Ontario. Taking on too much, and getting bogged down in too much detail, will ultimately undermine the Panel's efforts to help Ontarians understand the key issues, challenges and opportunities related to the energy transition. The Panel has a critical role in ensuring Ontario puts in place the necessary building blocks and first actions to ensure we make meaningful progress on the energy transition with our early actions, recognizing that planning will be an ongoing process through the transition.

To that end, we recommend focusing on the following core streams for decision-making:

- Governance and Planning
 - Long-term Planning
 - Coordinating System Planning
 - Evolution of the OEB
- The Future Role of Utility
 - Grid Modernization
 - Transition to DSO model
- Other Factors:

- Costs and Affordability
- Alternative Fuels - Hydrogen/RNG
- Energy Efficiency & DERs

While there may be other issues that need to be addressed, the majority of critical decisions fall within these categories.

GOVERNANCE

Strengthening Ontario's Planning Process

Historically, the OEB has delivered value for Ontario customers through its review of those elements of the electricity bill for which it has responsibility. Those aspects of the bill under OEB purview have seen reasonable cost increases over time, while allowing for significant investment in energy infrastructure and ensuring the fiscal health of participants.

Currently, electricity generation planning and procurement remains the primary outlier of energy planning that is not subject to OEB review. The public interest regulator, the OEB, is well-positioned to leverage the many other planning reviews under its purview (e.g., Distribution System Plans as informed by: the regional planning process; Mergers, Amalgamations, Acquisitions and Divestitures (MAADs) plans; Leaves to Construct) to develop an appropriately-scoped, efficient review of the electricity generation planning process.

A full review of the challenges that undermined the Integrated Power System Plan (IPSP) process should be undertaken to ensure we can avoid the problems faced by that process. A test of reasonableness, as opposed to correctness (which undermined the IPSP), of the following elements would be an enhancement to current planning governance in Ontario, including the:

- Planning assumptions;
- Approach to stakeholder engagement;
- Steps taken to incorporate stakeholder feedback;
- Procurement options considered, and
- Provincial Policy Objectives.

The EETP must clarify that any changes made to both the OEB and the IESO do not add new red tape or uncertainty to the planning process. Changes should be focused on the planning process at the IESO, as opposed to operations and procurement. Reducing regulatory barriers can serve as a low-cost approach to help accelerate job creation and private sector investment in energy infrastructure projects.

Optimizing and coordinating energy system planning

Energy planning in Ontario needs to change. Consumer choice and policy decisions will shape the nature and pace of transition. The pace of adoption of new technologies (e.g. EVs / heat pumps), new generation sources (e.g., central generation and DERs) and gains in efficiency will be a function of consumer preferences, cost, innovation, global supply chains, and policy choices made at all levels of government. These in turn will drive Ontario's systemic investment requirements. Because of this, we must change our planning framework. It needs to adapt to enable proactive investments to meet these customer needs, in transmission, generation, distribution, storage, hydrogen infrastructure, CCUS, etc. We need to shift the risk perspective - away from a fear of overbuilding, to prudently building enabling infrastructure.

Ontario needs a coordinated energy planning system that integrates and coordinates all elements of the energy mix - electricity generation, natural gas, hydrogen, geothermal, petroleum, etc.

Meeting emissions reduction goals will require a transformation of current energy end use technologies, supply side resources, and bulk and distribution level (electric and natural gas) infrastructure. With planning and regulatory coordination, the resulting energy system can be optimized for functionality, cost, reliability, resiliency and sustainability.

To achieve this:

- Gas and electric planning will need to evolve, synchronize and require more proactive coordination;
- The strategic goal of decarbonization must be accounted for along with legacy metrics of safety, reliability, cost-effectiveness, public policy, and risk management; and
- Gas and electric demand-side and supply-side alternative options and context must be provided in a similar format and timeline to enable the consideration and evaluation of a full suite of energy options.

The electricity and gas systems will become more interconnected on the journey to net zero. It will be critical that electricity system planning take a holistic view of the evolving energy system and be closely aligned with gas system planning. The OEB should lead the development of a coordinated energy planning working group involving major electricity and gas utilities. The EETP must ensure the use of both systems to deliver energy to all sectors (building transportation, industrial, power generation) and end-user costs, including stranded assets are modelled, as this supports decisions that avoid unintended consequences.

Coordinated planning will be increasingly important with the increasing energy conversion between electricity and hydrogen in the future. Electricity supply will be critical to scale up green hydrogen supply and meet hydrogen demand. Hydrogen

supply will also be critical in meeting peak electricity demand through hydrogen-fired gas turbines. Hydrogen will become an important long-term electricity storage option. Hydrogen will be produced during periods of electricity oversupply, and it will be used in periods of peak demand.

This integration can also happen behind the meter, with dual fuel technologies like hybrid heating systems operating intelligently to optimize the use of electricity and gas for space heating. By converting a significant portion of residential buildings to adopt hybrid heating systems that combine electric heat pumps with high efficiency gas-fired furnaces fueled by low or zero-carbon gas, the province can significantly reduce electricity system costs by reducing peak electric load. The Guidehouse Pathways² analysis shows that substantial adoption of residential hybrid heating systems can save Ontario at least \$9 billion compared to alternative scenarios.

The coordinated planning process will need to develop regulatory structures that value energy system resilience, reliability and customer choice. There will be many different scenarios that cannot be foreseen and accounted for. There should be a role for the competitive market and customer choice that will drive investments and system planning. The increased reliance on intermittent renewable sources establishes the need for a new consideration of the resilience of the energy system. Policies that foster complementary operations of electric, power storage, and pipeline systems will strengthen the energy system's resilience for local economies and communities.

The EETP must also help the government in establishing agency leads and process clarity for geothermal, hydrogen, RNG and CCUS to better support the energy transition. Currently these energy sources do not have a clear government and/or agency lead, and as a result, are not given equal footing in their ability to deliver on Ontario's evolving energy needs.

Also, in developing a coordinated energy planning process, the government and its agencies must recognize the unique nature of the role that Enbridge Gas plays in Ontario's energy planning process. Achieving the goals of a coordinated energy system in Ontario will be difficult, if not impossible, to fully achieve without providing cross-visibility into the planning process on both the gas and electricity system by the IESO and the OEB, as well as at the distribution table with LDCs.

Infrastructure Master Plan

The government should develop an overall, master plan for certain major infrastructure to ensure the future siting needs of utilities such as water, electricity transmission 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

² Guidehouse. *Pathways to Net Zero Emissions for Ontario*. Prepared for Enbridge. June 2022.

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 bulk system investment 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.

Evolutionary OEB Regulatory Reform to Support the Energy Transition

The current regulatory framework is largely suited to help us through this time of decarbonization and modernization in our grids and energy systems, when regulatory stability is desirable more than ever. The Renewed Regulatory Framework's (RRF's) emphasis on outcomes and results provides avenues to reconcile energy transition and net zero objectives by ensuring that the electricity system provides value to customers. The energy transition is shifting the relative priorities of what consumers want, providing a strong basis from which the OEB can evolve regulatory mechanisms and utility roles and responsibilities through adjudication.

Regulatory tools such as Deferral and Variance Accounts (DVAs) have been used in circumstances to manage cost impacts and investment "lumpiness" to achieve intergenerational equity. GHG emission reduction objectives at the international, national, and sub-national level anticipate action over a period longer than five-year utility rate cases. At the same time, there is not a singular pathway to net zero, and actions required of utilities may accelerate at a faster pace than a "no regrets" baseline plan. DVAs are a means by which uncertainty and flexibility can be managed for early net zero pathways actions.

Rate-setting options under the Renewed Regulatory Framework (RRF) already provide an ability to "customize" the framework in the face of particular needs and challenges that distributors face. Customizing regulatory incentives tied to outcomes, including outcomes that will enable an orderly energy transition, is another opportunity for the OEB to act and lead within the existing regulatory framework. These tools are familiar ones to the OEB, and they are also tools that are commonly employed by regulators in

other jurisdictions which are tackling energy transition. To that end, evolutionary (not revolutionary) change of known and well-understood regulatory mechanisms is, in the OEA's view, an appropriate and suitable place to regulate the journey to net zero.

Many other elements of OEB regulation can continue unabated, such as focal points on consumer protection, choice and affordability, service quality, public safety, and the financial viability of the electricity industry.

At the same time, the OEA is in principle supportive of a broadened the OEB's mandate to incorporate GHG emission reductions as a core objective within the *OEB Act*, as outlined above. The clear link between the actions of regulated entities and the pursuit of GHG emissions reductions is a strong basis to broaden the mandate of the OEB. The increasing expectations of stakeholders that LDCs will have a greater role to play in, for example, coordinating DERs for use in IESO markets, will require utilities to take on new roles and responsibilities. These roles and responsibilities will require the LDC to develop new capabilities - both in terms of the grid and how it operates, and the skills and services utilities will be expected to offer. While current regulatory tools that govern planning, performance and incentives are currently adequate to respond through adjudication, the OEA acknowledges that a broadened legislative mandate regarding decarbonization could allow the OEB to act more proactively and more broadly towards that outcome.

ROLE OF THE LDC

One subject that has received inadequate attention in recent discussions of the energy transition is the role that utilities can play in the transition. Technological advancement has significantly increased the number of energy supply options that can be developed at the local level. There is no question that an enhanced localized customer solutions model could reduce bulk system needs, improve reliability and reduce emissions at the same time. This would significantly increase Ontario's ability to meet its objectives for emissions reductions, reliability and affordability. To optimize this potential, Ontario will need to reconsider the role of utilities, who have direct customer relationship.

The EETP has a mandate to develop an effective pathway to improved long-term planning to:

- Address increasing electrification and the transition to clean energy;
- Capitalize on the need to transform current energy infrastructure (electric, natural gas and transportation fuel); and
- Optimize system functionality, cost, reliability, and sustainability.

To achieve its mandate, the role of the LDC and process for energy planning needs to fundamentally change. The speed and scale of the energy transition and electrification are unprecedented, driven/enabled by the:

- Decarbonization ambition of government (Federal, Provincial, and Municipal), the private sector, and society more broadly.
- Proliferation of and improved efficacy and economics of energy end use and decarbonization technologies (DERs, renewables, EVs, ASHPs, storage, hydrogen, and RNG).
- Need to harden energy systems to ensure reliability in response to and preparation for increased extreme weather events as a result of the physical impacts of climate change.
- Advancements in the ability to control systems and manage disaggregated supply and demand resources enabled by technological advances and the availability of and ability to manage massive amounts of activity data.

The LDC of the future needs to have stable, predictable access to a significant expansion of capital to prepare for electrification and ensure the grid remains resilient. The LDC will need to be allowed to evolve to provide new grid-edge services to meet both customers' needs and expectations, and system optimization goals. This will require a consolidated review of the governance of utilities to allow them to evolve on a spectrum based on their level of sophistication, individual grids, and unique customers to ensure that these they have the tools and flexibility necessary to achieve this outcome.

The EETP should speak to the potential of LDCs to contribute to Ontario's energy transition strategy. At a high level, the EETP should articulate a vision where LDCs evolve to become:

- **DSOs:** LDCs should evolve to Distribution System Operators (DSOs). They are the closest to the customer and can help manage load and optimize assets through CDM, demand response, energy management systems, generation, storage, and localized markets; and
- **LSEs:** LDCs should be enabled to opt-in to procure energy resources locally with parameters set by the province for price and emissions reduction goals.

All LDCs will need to make grid modernization investments to manage and leverage DERS, at minimum ("DSO-lite"), while more advanced LDCs should be empowered to procure and dispatch these resources (full DSO). Enhancing LDC capabilities, as outlined at a high level above, will ultimately benefit customers and ensure overall system optimization, reliability, and affordability for customers.

The EETP should also recommend the establishment of a DER target for incremental capacity in Ontario's supply mix, recognizing the flexible, affordable, and customer-driven potential of these resources. Based on the experience of leading jurisdictions such as the UK and Germany, we believe 15-20% of incremental capacity is a prudent target.

Without effectively leveraging DERs, the cost of new generation and transmission infrastructure (excluding distribution) is projected to be at \$375 billion to \$425 billion by 2050. Using comparable cost reduction projections from the European Union (EU) as a reference, it's clear that possible savings in Ontario are significant - 20-30% below projected costs in the existing model. As an example, the United Kingdom will save between £6-10bn (£2-4bn in distribution and transmission costs) per year (2023-2050) at a carbon intensity of 5g/kWh by allowing utilities to leverage DERs as DSOs.

Grid Modernization

This evolution needs to be enabled by policy and regulatory changes. No matter which pathway we choose, significant investments will be required in Ontario's electric distribution system. This will be necessary not only to meet the expanding capacity of a growing bulk system, but also to enable customer participation in the energy transition and to meet customer demands. To this end, the EETP should recommend immediate no-regrets foundational investments to modernize Ontario's electricity distribution system to ensure it can meet customers needs and expectations in transition.

Near-term grid modernization is likely the most affordable path forward but is unlikely to receive approval through current regulatory mechanisms. For example, future functionality, even if not used or useful immediately, may have to be proactively purchased during asset swap-overs to prevent stranded assets when such functionality is needed. As another example, meters may have an asset lifespan of a decade. It may be a smarter investment to purchase advanced metering infrastructure ahead of firm program rules if the alternative approach means that stranding new metering assets a few years down the line because they would have to be swapped out when programs are finalized.

The OEB will need to proactively signal long-term targets, programs, goals and enabling rules that will allow for the timely, most cost-effective purchases in support of those targets, rather than apply an "immediately used and useful" standard.

THE ROLE OF TRANSMISSION

The increasing electrification of energy, the greater availability of DERs and increasing complexity means that the overall flow of energy may change substantially and in unexpected manners. Given the scale of this transformational opportunity ahead of us, and the long timelines for new construction, enabling 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. In general, the expectation is that greater transmission assets will be required to enable localized/regionalized assets and resources to participate on a provincial basis.

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.

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.

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.

INDIGENOUS PARTNERSHIP

As the original stewards of the land, Indigenous nations have long been cognizant of climate change and have worked tirelessly to support solutions to the problems it poses. As such, it is critical that the enhancement and support of Indigenous partnerships in net-zero and decarbonization projects remain a priority as Ontario plans for the energy transition. The First Nations Major Projects Coalition (FNMPC), a national 130+ Indigenous nation collective, has affirmed that enhanced Indigenous inclusion on net-zero infrastructure has the potential to both support the construction of climate solutions infrastructure and contribute to Indigenous self-determination and economic reconciliation. The FNMPC suggests that this can be accomplished by planning for meaningful *equity ownership* of these projects by Indigenous nations. Therefore, it is incumbent upon the IESO and the OEB to review and consider how current frameworks and requirements can facilitate and enhance the inclusion of Indigenous partners in the energy transition. It is important to note that even the best intended processes that work for non-Indigenous organizations can, at times, deter/prevent Indigenous partnerships and inclusion.

To achieve an inclusive energy transition, Ontario should address potential barriers to Indigenous participation and, in doing so, ensure that adequate financing support is available to Indigenous nations to enable their participation as project partners.

INVESTING IN LOW-CARBON GASEOUS FUELS

Low and zero-carbon gas will be indispensable to get to net zero. While electrification is a powerful tool that will be required for reducing GHG emissions of many sectors, electrification is not practical for all sectors. Some sectors such as heavy transport or industries with high temperature processes like steel and chemicals have considerable carbon footprints and are challenging or next-to-impossible to decarbonize through electrification. Reaching net zero emissions in Ontario cannot be achieved through electrification alone. Low and zero-carbon gases like RNG and hydrogen will play an important role in the GHG emissions reductions of most sectors, particularly in hard-to-abate sectors like heavy transport and industry. RNG and hydrogen present an excellent opportunity to minimize Ontario's reliance on energy imports and promote energy independence. Additionally, there is a significant opportunity to leverage the blending of low-carbon gases to support reduced emissions in building heating.

Hydrogen

Ontario's current gas infrastructure can be repurposed to hydrogen to avoid costly investments in new electricity infrastructure. Ontario has an extensive natural gas network made up of 150,000kms of underground pipe, delivering nearly twice as much energy per year as the province's electricity system and four to five times as much in terms of the average peak energy demand. Ontario's pipeline network is ideally suited to be repurposed to a hydrogen network, as the province's newer pipelines, typically made of polyethylene, are already largely hydrogen-ready. Metal pipes will require integrity assessments and internal coatings before they can be used to transport hydrogen. Nevertheless, this can be done for less than a quarter of the cost to build new hydrogen pipelines.³ Repurposing existing natural gas infrastructure for hydrogen would be a more efficient use of existing infrastructure than an Electrification scenario where much of the gas network would be decommissioned. Utilizing the existing pipeline infrastructure will allow stakeholders to continue benefitting from the reliability that gas utility systems provide and the competitiveness it offers Ontario's industries. Additionally, the inherent characteristics of pipeline infrastructure (which is mostly underground) support a resilient energy system.

In addition, underground geologic formations in Southwestern Ontario include salt caverns, aquifers, and depleted reservoirs. The International Energy Agency (IEA) is conducting studies to prove the viability of underground hydrogen storage salt caverns (HyStock, Netherlands) and gas fields (Sun Storage, Austria and Hychico,

³ 102 Guidehouse (2021). European Hydrogen Backbone: Analysing the future demand, supply and transport of hydrogen. https://gasforclimate2050.eu/wp-content/uploads/2021/06/EHB_Analysing-the-future-demand-supply-and-transportof-hydrogen_June-2021.pdf

Argentina), although there are currently hydrogen storage projects in operation salt caverns globally, resulting in a higher technology readiness level for salt caverns over depleted reservoirs/gas fields.⁴ Enbridge has 288Bcf of natural gas storage in 35 underground depleted reservoirs that may be capable of hydrogen and hydrogen-blend storage. Research needs to be done to explore if hydrogen storage in porous (depleted reservoirs or aquifers) and non-porous (salt caverns) geological formations can provide the means to ensure a continuous and reliable hydrogen supply. Hydrogen storage would provide the means to ensure a continuous and reliable hydrogen supply, mimicking the current natural gas system's ability to offer seasonal terawatt-hour storage capabilities.

To achieve net zero emissions by 2050, actions are required by all Ontario stakeholders. Policymakers, regulators, and utilities must consider the outlook to 2050 when evaluating different GHG emissions reduction pathways because some options that achieve 2030 goals may not enable cost-effectively achieving net zero emissions by 2050. OEA believes that:

The Ministry of Energy should:

- Define medium-term (2030) and long-term (2045) planning targets for hydrogen supply much like the strategic ambitions set by other countries such as the UK (5 GW), France (6.5 GW), and Spain (4 GW) and by the European Commission (40 GW).
- Investigate market measures and incentives that support hydrogen adoption such as low carbon fuel incentives, carbon pricing, targets for FCEV and hydrogen-fueled appliance deployment, and renewable gas mandates.
- Expand the regulatory oversight of the OEB to include hydrogen, hydrogen-derivatives and the associated supply, transport, and storage infrastructure.
- Work with the relevant Ministries to enable carbon capture and storage for blue hydrogen production.
- Work with the Federal government to set the life-cycle intensity of low-carbon hydrogen.

The OEB will be a large part in helping hydrogen and should:

- Develop regulatory framework for hydrogen and infrastructure. Without clarity on how hydrogen supply and infrastructure investments will be regulated, utilities and end users can only rely on the existing natural gas framework as an example. The OEB should gather stakeholder views and investigate how other jurisdictions are approaching the development of a hydrogen regulatory framework.
- The hydrogen market must be shaped, just like how the natural gas market was, by numerous regulatory and legislative changes, as well as by technological advances and sophistication of the trading markets (physical and financial).

^{4 4} <https://www.iea.org/articles/proving-the-viability-of-underground-hydrogen-storage>

Regulatory oversight, in the natural gas market, became increasingly more sophisticated and it has adapted to the condition of the market over the past and this same sophistication can be brought to the hydrogen market.

- Allow utilities to recover the cost of hydrogen at a different cost than natural gas and in line with the market price of hydrogen.

RNG

While the supply of RNG in Ontario is currently small and more costly than importing natural gas, the province has significant RNG production potential. Torchlight Bioresources estimated Ontario's RNG potential via conventional RNG production technologies like anaerobic digestion and landfill gas.⁵ Torchlight's report estimated that Ontario has the potential to produce around 40PJ per year of RNG supply from wet organic wastes and up to around 224PJ per year if agricultural residues are included. These agricultural residues reflect waste products such as corn stover and corn silage, and not new crop production that would need to be redirected to RNG production. This RNG potential represents roughly 4%-26% of Ontario's annual natural gas demand.⁶ Most of Ontario's RNG is exported and, with other provinces setting ambitious RNG goals, this trend may continue. This may limit Ontario's ability to access local RNG supplies in the near term. The province of Quebec has announced in its Green Economy Plan that it aims to increase its renewable gas (including RNG and hydrogen) supply to 10% of its total gas supply by 2030. The British Columbia government has a 2030 goal for 15% of gas consumption to come from renewable gas, which may include RNG and hydrogen.⁷ The OEA believes that:

The Ministry of Energy should:

- Define binding medium-term (2030) and long-term (2045) RNG blending targets. Adopting binding RNG targets will provide a clear long-term planning horizon and investment certainty for RNG market players, investors, and for regulatory planning. A mandated blending target would allow the gas utility to recover the incremental cost for RNG.
- Investigate supply and demand market measures that can bolster RNG adoption in Ontario (e.g., guarantees of origin, RNG registers and certificates, low carbon fuel incentives, waste reduction policies), and renewable gas mandates.

The Ministry of Environment, Conservation, and Parks should:

⁵ Torchlight Bioresources (2020). Renewable Natural Gas (Biomethane) Feedstock Potential in Canada. Available: [https://www.enbridge.com/~/_media/Enb/Documents/Media%20Center/RNG-Canadian-Feedstock-Potential2020%20\(1\).pdf?la=en](https://www.enbridge.com/~/_media/Enb/Documents/Media%20Center/RNG-Canadian-Feedstock-Potential2020%20(1).pdf?la=en)

⁶ Torchlight's 220 PJ estimate is based on anaerobic digestion and landfill potential and does not reflect more advanced RNG production technologies like biomass gasification or power-to-gas, which are not yet commercially available. Of the 220 PJ estimate, landfill gas accounts for approximately 21 PJ, equivalent to 9%.

⁷ Government of British Columbia (2021). CleanBC Roadmap to 2030. p.60. Available: https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_roadmap_2030.pdf

- Recognize book and claim reporting under the Emissions Performance Standards (EPS) which would allow RNG delivered through the gas delivery system to be subtracted from the annual GHG emissions of EPS participants, where the purchase contract clearly demonstrates ownership of the environmental attributes. This reporting recognizes that although the end-users may not physically combust the actual molecule of RNG, they have the sole right to claim the emission reductions in their GHG reporting by contract.

The Ontario Energy Board should:

- Work with the Ministry of the Environment to ensure existing and future environmental regulations are supportive of RNG production.
- Allow utilities to recover the cost of RNG at a different cost than natural gas and in line with the market price of RNG.

Gas and Electric Utilities and System Operators should:

- Develop tariffs specific to RNG. Having separate rates for RNG and conventional natural gas may incentivize project development by RNG suppliers, as utilities would be able to recover the higher cost associated with RNG.

UTILIZING CARBON CAPTURE, UTILIZATION AND STORAGE

CCUS is a safe, proven technology that offers an important pathway for GHG reductions, particularly for hard-to-abate industries like steel, cement, and fertilizer. The International Energy Agency (IEA) and the Canadian Energy Regulator agree that CCUS are among the most critical decarbonization technologies.^{8,9} The Ontario Ministry of Natural Resources and Forestry has recently published a “Roadmap towards regulating geologic carbon storage” and has indicated its intention to support and enable CCUS for large emitters in Ontario.¹⁰ Further, the OEA is pleased to see the Government of Ontario has taken initial steps including through Bill 46 that removes legislative barriers prohibiting CCUS and through Bill 91 to set up for further regulatory developments that would enable “special projects”. These are important first steps, but further action is needed. A whole-of-government approach is needed to work with the industry in establishing a streamlined regulatory framework for new CCUS projects. CCUS is fundamental in reducing GHG emissions from natural gas, critical for heavy industry with few other decarbonization alternatives, and can play a key role in decarbonizing power generation. CCUS will also enable low-carbon hydrogen production, further supporting the development of a hydrogen industry in Ontario,

⁸ International Energy Agency, *Net Zero by 2050: a Roadmap for the Global Energy Sector* (October 2021 4th rev.), pp. 7, 60, 79-80;

⁹ Canadian Energy Regulator, *Canada’s Energy Future 2021* (2021), pp. 10, 16, 60, 76-78

¹⁰ See - <https://www.ontario.ca/page/geologic-carbon-storage>

potentially lessening the provincial dependence on energy imports, and creating well-paying jobs in the energy space.

OEA recommends that the Government of Ontario:

- Take a whole-of-government approach and work with the industry on developing a streamlined regulatory framework for CCUS investments.
- Modernize the OGSRA and other relevant legislation (e.g., Mining Act) to enable CCS opportunities.
- Adopt a Crown Vesting approach that leverages best practices from Alberta and British Columbia to maximize the potential of Ontario's finite pore space for the benefit of Ontarians and large emitters.
- Establish clear and transparent regulatory framework that requires proponents to meet world-class safety, technical and financial credentials.
- Work with the federal government to ensure that companies with energy-intensive manufacturing processes in Ontario are eligible for the federal Incentive Tax Credits and funding opportunities announced in the federal Budget 2023.

OTHER PRIORITIES

Realistically, we can expect energy planning for the province to continually evolve and change as we work our way towards net zero 2050. The OEA recognizes that the EETP cannot outline the exact pathway to net-zero for each sector. As the OEA pointed out in its *Net Zero*¹¹ paper in 2021, the International Energy Agency (IEA) has indicated "almost half the emissions cuts required to move us on a path to net zero by 2050 may need to come from technologies that are not on the market yet."

We are going to need all of them to have success in the energy transition. Therefore, we just provide enough detail here to underpin our recommendations on more immediate actions related to each resource.

Maximizing Energy Efficiency

Energy efficiency will be essential to the success for any pathway to net zero. Enbridge's demand side management (DSM) programs have helped customers save 31 billion m³ of natural gas, representing a cumulative reduction of 58MT of CO₂ emissions between 1995 and 2021. Similarly, the Conservation First Framework program, led by LDCs, delivered over 8.7 terawatt hours (TWh) of energy savings between 2015 and 2020, and peak demand reductions of over 1,330 megawatts (MW) which the current CDM Framework has begun building on.

¹¹ OEA. Net Zero. June 2021. https://energyontario.ca/Files/PDF%20files%20to%20share/OEA_Net_Zero_2050.pdf

Every review of pathways to net zero in other jurisdictions has found energy efficiency to be one of the most cost-effective tools available to achieve the goal. Ontario will be no different.

The EETP should recommend that the province continue to support increasing cost-effective electric and natural gas conservation in Ontario, balancing bill impacts with the level of savings pursued. It is also essential the government continue to coordinate DSM and CDM offerings with new federal, provincial or municipal government funding for energy efficiency and GHG reduction programming. This must be done to ensure new funding does not displace or duplicate existing programs and that delivery is coordinated where reasonably possible to the benefit of program participants.

One key to success in Ontario will be to restore the capability of Ontario's LDCs to contribute to energy efficiency goals. LDCs have a proven track record of delivering cost effective energy efficiency programs, as outlined above. LDCs are strong and capable sector participants, with direct customer contact and experience that can be leveraged. The EETP should recommend that a meaningful role for LDCs in conservation programs is restored.

Additionally, there is a need to further facilitate the coordination of Enbridge's DSM programming and the IESO's CDM programming to ensure all conservation activities are working together to produce the greatest level of energy savings and reductions in GHG emissions. A common roadmap and/or framework plus facilitation before developing new CDM and/or DSM plans would ensure that impacts across both energy systems are considered. Enbridge and the IESO must understand the policy considerations before developing any conservation plan. These considerations include how much electrification should be included in a DSM-CDM plan, the type (hybrid fuel system versus electrification), how programs should be funded (gas rates/electric rates/tax base), and, finally, what guardrails and/or coordination policies should be in place to ensure energy system capacity is planned and reliability maintained in line with the levels of increased electrification proposed in CDM and DSM programming. The OEB's long-term energy planning coordination and integration must be undertaken to ensure the most cost-effective, reliable, and resilient pathway to GHG emissions reductions is developed and that unintended consequences are avoided.

Commercial Flexibility for Generation Projects

As noted in the Pathways to Decarbonization Report, "the IESO is forecasting increased supply needs out to the end of the decade, with the possibility that electrification and economic development outpace projections. Ontario should continue to move swiftly to acquire new non-emitting resources and incentivize energy efficiency to meet emerging needs." Traditionally Ontario has procured incremental capacity through

competitive procurements (RFPs), which are ideal for natural gas generation, wind, solar and battery storage facilities where you have a large pool of developers, constructors and suppliers which drive competition and lower costs. RFPs, however, are far less suitable for large hydro, nuclear and long duration storage like pumped hydro which have long development cycles, long cost recovery periods, and limited project sites. For these project types, rate regulation derives the lowest cost of capital to the benefit of ratepayers and enables cost prudence to occur in a transparent hearing process before the Ontario Energy Board. Given the magnitude of Ontario's need for incremental, non-emitting capacity and energy shifting resources, suitable commercial pathways should be supported and activated to secure needed resources, while protecting Ontario ratepayers

Create Integrated Pathways for DERs

Ontario needs a strategy to optimize the use of Distributed Energy Resources (DERs) at the local and bulk system level. Ontario can unlock whole system value by enabling new pathways for DERs. The more visibility distributors have into system conditions in real time through grid modernization, the greater ability they have to develop analytics to figure out how to connect more load to existing assets in a safe and reliable manner. This will also allow distributors to build and gain experience with a platform that will enable bidirectional flows of electricity that could unlock whole-system value beyond the individual customer adopting the EV, heat pump or behind-the-meter battery energy storage (BTM BESS) when considered in aggregate. This will unlock value to the local system, bulk system, and societal level.

Incentives and protocols for DERs will need to be aligned. To tap the full value stack (local, bulk and societal), DERs require economically compelling, well-coordinated and easy-to-access pathways for revenue that present a better opportunity than current avenues (e.g., programs that aren't aligned to market signals, programs that don't allow value stacking). This implies a need for close coordination between the market operator, LDCs, regulators, DER aggregators and customers.

The collective effect of various markets and programs currently available to DERs is not optimally designed to induce the most value out of DERs. Coordination protocols between LDCs and market operators must be designed in greater detail.

Initiatives like Toronto Hydro's Benefit Stacking Program (in partnership with Power Advisory and supported by the IESO's GIF project and OEB Innovation Sandbox) is exploring if DERs can address identified local needs and bulk system needs simultaneously. Until that work happens, there is a strong basis for a programmatic approach to DER procurement at the IESO to ensure local opportunities can be fully explored, in alignment with the OEB's expectations in the FEI report.

Expanding the Capacity Auction

The IESO's capacity auction has successfully delivered low-cost system capacity for many years now. The IESO should move expeditiously to expand this market so that Ontario gain an understanding of the magnitude of capacity that can be delivered by this mechanism. Concerns about over-procurement, or efforts to drive excess competition and drive down prices for a small amount of capacity, should be secondary to our efforts to begin building this resource to become a major element of our capacity going forward. Any price reduction gains through short-term restrictions on the size of this resource will result in a hollow victory for Ontario. We will fail to grow a resource which ultimately could deliver some of the lowest cost electricity via its competitive process. Ontario needs to attract investors to this market for the long-term, in what is a very competitive North American and global marketplace for resources and talent.

Residential Demand Response (RDR)

Residential demand response (RDR) has tremendous potential to provide low-cost capacity to the province. Currently in Ontario, when residential air conditioners all peak at the same time during heatwaves, they work together to create Ontario's largest electricity peak capacity need. RDR is a readily available technology that could shave this peak significantly, with limited if any impact on the residential air-conditioning experience. Past experience with the "Peak Saver" program in Ontario by OEA LDC members suggests that there were minimal if any complaints from program participants, yet meaningful capacity savings delivered on a per household level.

However, RDR is at a nascent stage in Ontario. It is too early to expect RDR to participate in the capacity auction. This is because the cost of customer aggregation is currently high, which includes procedural and regulatory complexity in elements. This significantly impairs the potential scale of the program, and therefore its ability to compete in a competitive auction. Taken together, these barriers significantly impair the potential scale of residential DR participating in the capacity and energy markets in Ontario. Without any change in the policy and incentive landscape, which maintains appropriate protection for customer privacy, customers must be acquired one-at-a-time via individual consent. This will make large scale aggregation difficult.

These challenges should not stop Ontario from pursuing this resource. We have seen many examples in the past where government policies or programs can facilitate large public participation. This can be done through incentives that drive large scale participation, and purposeful customer engagement strategies that leverage the use of technologies (such as smart thermostats and soon EVs) and marketplaces.

Some LDC's are looking at implementing RDR programs to address local needs. LDCs are generally uniquely positioned with direct customer contact and experience that can be leveraged to support RDR program delivery, and leverage this resource to address local peak capacity needs often in partnership with third party providers. This requires collaboration and cooperation to ensure a good customer experience and reduce market confusion through duplicative initiatives.

The benefits for Ontario energy customers of a meaningful large scale RDR program would far outweigh the cost of alternatives, which should be kept in mind as policy makers and politicians struggle with the challenge of designing new programs which nudge customers towards a very beneficial program.

C&I Demand Response

Ontario Commercial and Industrial Demand Response participants currently participate in the Capacity Auction either directly or through Aggregators. As more and more resources, including imports from neighbouring jurisdictions, are being allowed to participate in the auction, the DR resources are facing increasing competition and growth will likely not occur. The IESO *Pathways to Decarbonization* report suggests a scenario where the province will need to secure up to 3800MW of DR; a target unlikely to be achieved in the current model. Incentives should be considered for this resource to promote increased participation. LDC involvement can be quite important to success here. Local DR programs are already part of the innovation sandbox, and the OEB report already highlights model where LDCs or DSOs could be using DR with third party providers as a local/bulk resource.

Renewables and Storage

Some of the options Ontario will be considering to lead us to net zero have a long lead time. In the interim, Ontario will need to explore all available options to meet growing electricity needs. Renewables, paired with storage, have a much shorter development time horizon, so represent an excellent and proven option to help us increase capacity and energy needs as we look to make concrete progress in the near term. The cost for renewables paired with storage has been declining around the world as experience in developing these resources grow and is now the cheapest form of new electricity in Ontario. We believe The Ministry of Energy should:

- Provide clear direction to IESO to develop a renewables and power storage procurement roadmap that provides a forward-looking outlook at come procurements than is currently provided in the Annual Acquisition Report,
- Address the Global Adjustment to enable Corporate/Virtual Power Purchase Agreements between offtakers and generators, which is driving significant low-cost renewables development in Alberta,

- Provide clear direction on its plan to implement the Clean Electricity Regulation and on carbon pricing beyond 2030, and
- Expand and improve coverage of its Indigenous financing programs to better enable meaningful Indigenous economic participation in this emission-free development.

Hybrid Heating

Fortunately, there are alternative pathways available which will allow Ontario to meet its goals. A 2022 Guidehouse Pathways study¹² concluded that reducing GHG emissions from the gas system will be a less disruptive and more cost-effective option than full electrification for many customers. The analysis shows the benefits are not only limited to cost savings, but also largely to ease short-term implementation concerns.

One option is to pursue dual fuel technologies like hybrid heating systems operating intelligently to optimize the use of electricity and gas for space heating. By converting a significant portion of residential buildings to adopt hybrid heating systems that combine electric heat pumps with high efficiency gas-fired furnaces fueled by low- or zero-carbon gas, the province can significantly reduce electricity system costs by reducing peak electric load. Guidehouse's Pathways¹³ analysis shows that substantial adoption of residential hybrid heating systems can save Ontario \$9 billion compared to the base Diversified scenario.

This alternative approach tempers the need for building retrofits, allowing for a paced and measured uptake of heating equipment upgrades. With more than 65% of residential buildings in Ontario already equipped with either gas furnaces or boilers, replacing them all solely with electric heat pumps will require considerable renovation to ensure buildings are adequately heated and insulated. These improvements are also likely to increase electricity demand, which will require lead time to facilitate investments in new generation, transmission, and distribution infrastructure. The alternative approach offers an opportunity to avoid some of these issues and allow for time to resolve them. Heating with low and zero-carbon gas requires limited building renovation and in the near term, blending RNG and hydrogen into the gas grid does not require new heating systems. Only in the longer term, with a 100% hydrogen gas grid, would hydrogen-ready heating systems be needed.

¹² Guidehouse. *Pathways to Net Zero Emissions*. Prepared for Enbridge. September 2022. https://www.enbridgegas.com/-/media/Extranet-Pages/Sustainability/Pathways-to-Net-Zero/20220909_Enbridge_Ontario-Pathways_Report_FINAL_AODA_508-Compliant.ashx?rev=62f0220946d94d9b98a6e6264708e7c6&hash=E6F726ECF790436335D30631BEB7ABD3

¹³ Ibid.

AFFORDABILITY

Our progress on the path to net zero will fail if we do not maintain customer affordability. If affordability impacts are too significant, the process will lose voter support. Integrated, proactive, staged planning is critically connected to ensuring we are on an affordable pathway. The OEA believes that its recommendations, as outlined above, will ensure Ontario finds the most affordable path possible that still meets societal objectives for reliability and sustainability.

The energy transition is going to require some of the largest infrastructure investments in Ontario's history. This new infrastructure will often be costly. Most often our objective will be to help energy customers transition to sustainable energy solutions with minimal impacts on their overall household or business energy costs. However, part of the work of the panel, government and our sector is to be transparent with Ontarians that new infrastructure is expensive, and in some cases, for some households and businesses, energy costs will rise. We need to work together to minimize those impacts and provide assistance to those who may face difficulty in transition. Honest and transparent communication is important. With careful planning, and transparency, the OEA believes that Ontarians can be convinced to maintain their support for energy transition.

A good example of this in Ontario is the transition to full cost recovery that was undertaken to allow water utilities across the province to fully fund their infrastructure needs through ratepayers. Municipalities communicated a plan to move to full cost recovery over a specific timeframe, sometimes with nine (9) percent annual rate increases over many years to achieve full cost recovery. This transition was undertaken successfully with minimal citizen pushback. We will not likely need rate increases of this magnitude, but it is a good example of where up-front communication and planning can help sustain citizen support.

The EETP has a role in speaking to costs and affordability in transition. While there may be some, or even many, whose overall energy costs do not increase, with the magnitude of change being considered for energy transition, there will be a wide array of distributional impacts. And as we know from experience in Ontario, specific negative outcomes and anecdotes can drive significant public opinion. The panel needs to prepare government and Ontarians for this fact.

The EETP can recommend steps to pursue affordable strategies, and thereby maintain public support for the transition. Among those strategies would be the following recommendations:

- Provide early clarity on policy and direction. This is important to manage costs for customers. Failure of advanced planning generally results in higher costs.

- Steer public discussion from a focus on electricity costs to energy costs - look at the full customer perspective.
- Conservation and demand management will be critical in managing costs during the transition. Ensuring utilities are enabled with the tools to allow them contribute solutions at the local level, which will ensure an optimized and much more affordable system for customers.

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