

Green Ribbon Panel

Submission for the

**Ministry of Energy, Northern Development and Mines review
of Ontario's long-term energy planning framework**



GROWING ECONOMY.
SUSTAINABLE ENVIRONMENT.
REAL SOLUTIONS.



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About the Green Ribbon Panel

The Green Ribbon Panel was formed in February 2020 by a collection of environmental and economic leaders from across Canada with the primary goal of advancing practical and executable solutions to climate change. The panel examined the role that nuclear and Canada's other clean energy technologies can play in the fight against climate change while creating jobs and growing the economy.

The panel comprised:

- James Scongack, Bruce Power – Chair
- Christopher Hilkene, Pollution Probe
- Steve McCauley, Pollution Probe
- Rocco Rossi, Ontario Chamber of Commerce
- Vanessa Foran, Asthma Canada
- Dennis Darby, Canadian Manufacturers and Exporters
- Mark Fisher, Council of the Great Lakes Region
- Cara Clairman, Plug'n Drive
- Bruce Wallace, Nuclear Innovation Institute
- Robert Stasko, Hydrogen Business Council
- Jeff Parnell, Power Workers Union
- John Sprackett, Power Workers Union
- Scott Travers, Society of United Professionals
- Mitch Twolan, Warden Bruce County

The Panel focused on the role that nuclear and other technologies that anchor Canada's energy sector can play in fighting climate change and growing the economy at home and abroad.

In 2020, the GRP laid out principles and a call to action to address climate change, the energy transition and economic competitiveness. Many successes have emerged since that time. This report builds on that prior work and recognizes the sea change taking place in civil society's support of climate action.

Executive Summary

The MENDM's call for long-term energy planning reform has come at the right time, as the challenge of managing the energy system is becoming increasingly complex and the risks of undesirable planning outcomes are intensifying.

The GRP is very supportive of the government's initiative to reform how energy is planned in the province. It appreciates that the government is seeking stakeholder input on how it may rely more on the capabilities within the IESO and the OEB to transparently plan for Ontario's energy future, and ensure implementation effectively meets Ontario's needs in an accountable manner. Such an initiative is crucial to Ontario's energy future as the need to take affirmative action on climate change becomes ever more urgent.

This GRP response builds on the prior work of the coalition and recognizes the changes taking place in Ontario's energy system. In October of 2020, the GRP laid out a call to action and set principles to address climate change, the coming energy transition, and the province's economic competitiveness. Since then, momentum has built behind Net Zero by 2050 in both government and civil society. These principles remain well-aligned with the government's objectives, and the transition towards Net Zero.

Pursuant to the principles established in 2020 and the findings of this report, the GRP recommends the government consider the following as it reviews the roles of the government, IESO, and the OEB:

- Government can best reduce its risk by setting clear policy priorities for energy planners that include emphasizing elements of the GRP's principles:
 - Pursue decarbonization of the energy system and the economy
 - Consider the benefits of emerging innovative solutions in holistically planning for the transition to Net Zero
 - Plan for the requisite low-cost, low-emitting energy supplies, and ensure to maximize existing assets to their fullest potential to achieve a pathway that leads to Net Zero,
 - Leverage policy tools to encourage public-private partnerships to advance the above objectives
 - Enhance the competitiveness and economic strengths of the province
- IESO's existing 'living plan' approach to stakeholder engagement is a good model but lacks an accountability mechanism for ratepayer costs.

CHAPTER 1. Progress on GRP principles aligns with energy planning reform objectives

Net Zero ambitions underscore the relevance of GRP recommendations and the importance of planning

Principles

<p>1 Embracing the urgent need to address climate change is the foundation for action</p> <ul style="list-style-type: none"> Climate change is a real threat that must be addressed now through action that is proven to produce results. Decarbonizing the economy via increased electrification is pivotal to the success of critical economic sectors such as transportation (trucking, transit and electric vehicles), buildings (HVAC) and industry (process heat). Combating climate change through electrification is paramount to cleaning our air and removing toxic pollutants. A clean electricity system can be leveraged in the production of hydrogen as a clean fuel. 	<p>3 Low-cost, low-carbon emission energy represents a competitive economic advantage for Ontario and Canada</p> <ul style="list-style-type: none"> Ontario's unique position within the highly-integrated Great Lakes Economic Region represents a strategic advantage for several key economic sectors and for enhancing exports. Economic growth must be achieved in a balanced manner that provides benefits across the province and Canada. Economic spin-off benefits will result through job creation and trade, but also low emission energy/green sources will have a positive effect on health for our citizens – this in turn lowers government expenses. Clean technology solutions can be exported to help other countries reduce emissions from electricity generation.
<p>2 Ontario is well-positioned to build the clean electricity system that can be a cornerstone of Canada's future low-carbon economy</p> <ul style="list-style-type: none"> Canada's low-carbon emitting electricity supply mix should be sustained and enhanced to ensure long-term, low-carbon energy security and export opportunities. Ontario is uniquely positioned to help create sustainable solutions given its' historic broad energy mix, clean energy technology sector and successful replacement of coal generation with nuclear. Existing and developing nuclear and hydrogen technologies are well-suited to meeting Ontario specific low emission energy demands going forward, not only in the electricity system but within priority sectors of the economy. Leveraging a clean electricity system through new or existing hydro pump storage capability in Canada and the role of other renewable sources. 	<p>4 The enabling policy frameworks must be diverse and require participation from all levels of government and public-private partnerships</p> <ul style="list-style-type: none"> The supportive policy framework should be predictable, stable, transparent, and evidence-based. Achieving economically beneficial climate change mitigation will require multi-faceted policy levers to support behavioural change, financing, regulation, labour force capability and infrastructure development. Recommendations must acknowledge the current fiscal challenges facing Canada and Ontario today, e.g. Covid-19 Pandemic.

GRP Recommendations

- Leverage Ontario's unique clean energy technologies and existing assets to reduce GHG emissions and lower energy costs.
- Focus policy objectives on clear, short-term, tangible actions that prioritize targeted, proven, executable solutions and that embrace the diversity of regions across Canada.
- Develop a pan-Canadian Hydrogen solution that includes integration with Canada's oil and gas sector, further deployment of hydrogen as a transportation fuel, and leveraging of Canada's clean electricity assets
- Pursue electrification of the economy supplemented by the application of hydrogen technologies to incrementally and reliably achieve the necessary GHG emission reductions
- Develop a Green Collar Jobs Strategy to build upon Ontario's major strength in its skilled, diverse labour force to underpin and develop, innovate and execute critical activities and projects.
- Establish Ontario's brand as a clean jurisdiction known for sustainable products.
- Leverage Ontario's status within the Great Lakes region to maximize the benefits of sustainability policies.
- Engage the federal financial institutions, such as the Canadian Infrastructure Bank, to enhance the economic contributions of Ontario's domestic advantages
- Create a federal Next Generation Energy Innovation Fund to place focus on the development of demonstration projects for Canada's future clean energy game-changers.
- Consider how future public revenue from carbon pricing policy schemes should be revenue neutral to government and targeted at enhancing the competitiveness of trade-exposed sectors.

Significant progress has been made on the GRP's recommendations.

Since the GRP's two reports were released in September and October 2020, the Ontario and federal governments have made much progress on the GRP's recommendations. The GRP applauds both governments for these actions.

Initiatives in Ontario have involved:¹

- Addressing Emissions
 - Establishing an advisory panel on climate change to provide the minister with expert advice.
 - Creating the Cleaner Transportation Fuels regulation to increase requirements for renewable content in gasoline (e.g. ethanol).
 - Securing federal acceptance for Ontario's EPS in lieu of the federal OBPS.²
- Advancing Technology
 - Matched a \$295 million investment with the federal government to retool Ford of Canada's Oakville Assembly Complex into a global hub for EV production.
 - Releasing a low-carbon hydrogen discussion paper to inform a strategy for creating jobs and reducing greenhouse gas emissions.
 - Through the OEB, supporting pilots for:
 - Enbridge Gas' voluntary renewable natural gas program; and,
 - The blending of renewable hydrogen gas into the existing natural gas network.
- Leveraging Energy Sector Ambitions
 - Bruce Power has committed to achieving net-zero for their operations by 2027.³
 - OPG released a climate change plan to drive efficient, economy-wide decarbonization and economic renewal, while protecting the environment.⁴
 - Included actions on electrification, renewables, energy storage, and SMRs.

Federal initiatives have included:

- Creating Canada's strengthened climate plan, which includes provisions to not only exceed the country's 2030 Paris Agreement emissions reduction goal, but also achieving net-zero (NZ) emissions by 2050.⁵
- Establishing a Net Zero Advisory Body of experts from around the country to provide advice on pathways to net-zero by 2050.⁶
- Releasing the Hydrogen Strategy for Canada.⁷
- Releasing Canada's SMR Action Plan.⁸
- Progressing the Clean Fuel Standard (CFS).⁹
- Successfully confirmed the legitimacy of the carbon price and its presence in the economy.

¹ Government of Ontario, 2021

² Government of Ontario, 2021

³ Bruce Power, 2021

⁴ Ontario Power Generation, 2020

⁵ Environment and Climate Change Canada, 2020

⁶ Government of Canada, 2021

⁷ Natural Resources Canada, 2020

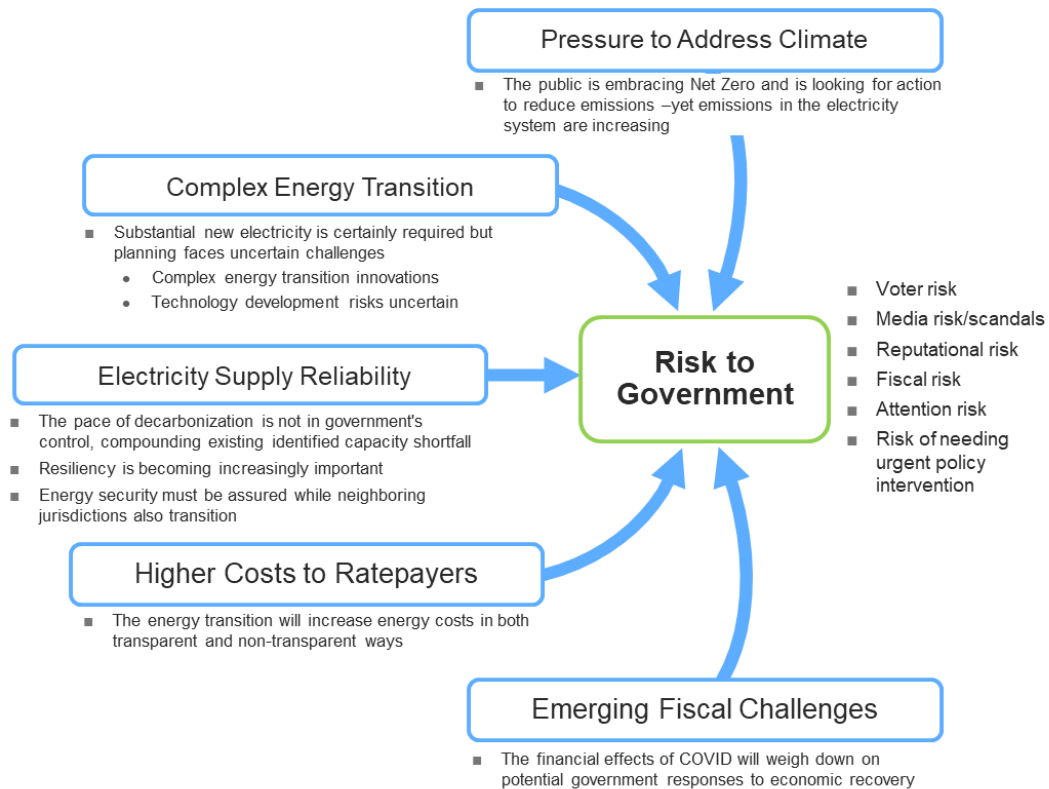
⁸ Natural Resources Canada, 2021

⁹ Environment and Climate Change Canada, 2020

Ontario is at an inflection point in the energy transition.

Emerging factors on the horizon require policy responses and entail risks to government.

Figure 1: Converging Risks to Government



Source: Strapolec Analysis

The energy transition underpins many factors impacting objectives for reform of energy sector planning:

- Climate action is driving a need for electrification that must be planned for.
- Technology innovation implies greater need for holistic planning process among electricity, natural gas, and the hydrogen economy.
- Sustaining system reliability through the energy transition warrants planning now for the future,
- A new planning framework must ensure affordability while addressing nature of demand, and regional needs.
- An effective energy transition can be aided by government policy tools.
- The economic leverage of infrastructure investments must be planned for.

This update from the GRP explores these factors and how they are critical considerations to reforming the energy planning framework and reviewing the roles of government, the IESO and the OEB. In today's energy planning framework, Government sets policy and the IESO undertakes responding activities and provides inputs to government for long term energy policy development (e.g. Annual Planning Outlooks). The OEB currently has no role in electricity system planning other than its rate hearings, which review the cost of regulated utilities' implementation approaches.

CHAPTER 2. GRP principles guide the pathway to a low carbon economy

Planning for and building Ontario's low carbon electricity system is the cornerstone of a NZ future

Principles Served

- 1** Embracing the urgent need to address climate change is the foundation for action
- 2** Ontario is well-positioned to build the clean electricity system that can be a cornerstone of Canada's future low-carbon economy
- 3** Low-cost, low-carbon emission energy represents a competitive economic advantage for Ontario and Canada
- 4** The enabling policy frameworks must be diverse and require participation from all levels of government and public-private partnerships

Recommendations Extended

- 1** Leverage Ontario's clean energy technologies & existing assets
- 2** Focus policy objectives on clear, short-term, tangible actions
- 3** Develop a pan-Canadian Hydrogen solution
- 4** Pursue electrification of the economy

1 Climate action is driving a need for electrification that must be planned for; NZ points to significant new demand for electricity

The GRP recommended pursuing electrification of the economy to incrementally and reliably achieve the necessary GHG emission targets. Electrification will create new demand for electricity that needs to be adequality planned for.

Several strategies for reducing GHG emissions have been identified for Canada. These include energy efficiency, reducing industrial process emissions, carbon capture, and hydrogen.¹⁰ While each of these will offer opportunities for emission reductions, electrification remains one area that is certain to be required and is looked to as often as carbon capture. How the balance of emission reduction options will play out will be influenced by the various benefits and challenges across provinces.

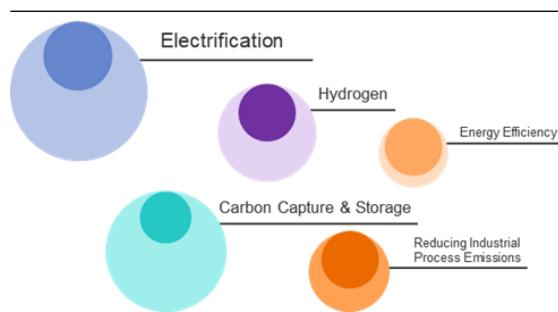
The Ontario government has set strong targets with its emissions reduction goals in its Made-in-Ontario Environment Plan to protect our air, land and water and reduce litter and waste, while lowering greenhouse gas emissions and helping communities prepare for climate change.¹¹ Achieving the targets set out in this plan for Ontario will require maximizing the value of our existing infrastructure to meet electrification demands, achieve efficiency gains and encourage the adoption of new technologies.

Along with efficiency gains, electrification of the primary emitting sectors in Ontario could eliminate 65% of economy-wide emissions, primarily through the following technologies:¹²

- **Buildings** - Heat pumps and electric water heating for both residential and commercial buildings
- **Transportation** - EVs for passenger vehicles and both EVs and hydrogen options for freight
- **Industry** – Electric heating for light industry process heat and technology switching for heavy industry (e.g., hydrogen)

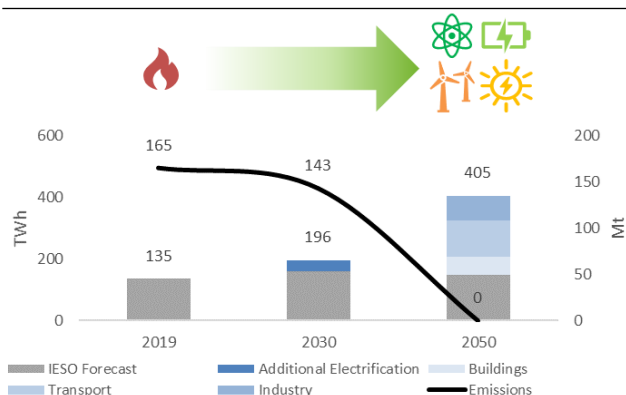
Electrification would increase electricity demand by 2050 by a minimum of 200 TWh over today, from both direct electrification and demand for electricity from creating hydrogen through electrolysis. This coming demand will be an important consideration for long-term planning in the electricity system.

Figure 2: Illustrative Range of Emissions Reduction Potential by Strategy



Source: Canadian Institute for Climate Choices, 2021; Strapolec Analysis

Figure 3: Emission Reduction & Electrification Pathway to 2050 (TWh & Mt)



Source: IESO 2020; Larson, et al., 2020; ECCC 2021; EIA 2020; ICCT 2020; NRCAN 2021; Strapolec Analysis

Note: 2019 data used in place of 2020 to remove impact of COVID 19 pandemic on emissions and electricity demand

¹⁰ Canadian Institute for Climate Choices, 2021

¹¹ Ontario Ministry of Environment, Conservation and Parks, 2018

¹² Strapolec Analysis

2 Technology innovation implies greater need for holistic planning processes among electricity, natural gas, and the hydrogen economy

The emerging energy transition is changing the landscape of what “energy” is and what planning for it should entail. The GRP recommended that Ontario’s existing assets and emerging hydrogen technologies be leveraged by this transition.

Planning for the energy transition involves the interplay of three key sectors:

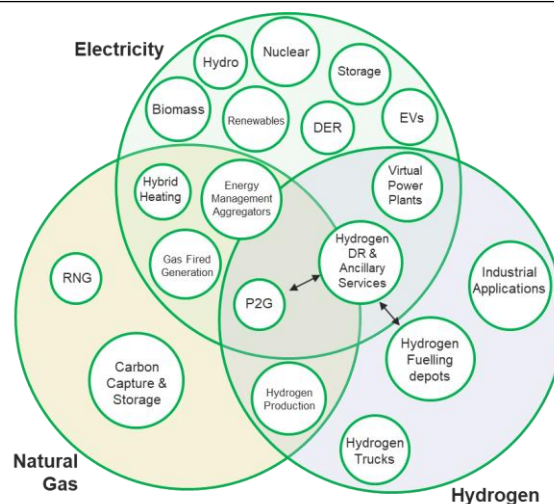
- 1) **Electricity** which must provide the emission-free energy source of the future
- 2) **Natural gas** for building heating, industrial heat, and electricity generation
- 3) **Hydrogen** which will see increasing use by industry and hydrogen-powered vehicles

Strategies to optimize the use of existing assets, such as nuclear and the natural gas distribution systems, along with new hydrogen technologies may disrupt the conventional view of energy system planning by requiring the integration of these along with other emerging technologies. Emerging technologies that can further optimize the cost of energy include:

- **Hybrid heating** devices that are dual-fueled by natural gas and electricity can reduce electricity needs during peaks, while allowing for baseload electricity to service the heating load.
- **Energy management systems** can optimize home heating (including hybrid heating devices), EV charging, water heating, and potentially even appliance operation.
- **Community storage** can be located near demand loads and smooth variable demand, potentially reducing grid infrastructure costs by enabling greater use of growing baseload supply. Similarly, **EVs** can provide mobile storage capabilities to help address peaking demand needs and also act as **virtual power plants (VPPs)**.
- **Hydrogen electrolyzers** provide a cost-effective source of demand response and ancillary services that could be regionally distributed across the province near load centers (e.g. LDCs) where the benefits are most needed.

Opportunities are already being explored. Enbridge is currently running a pilot with support of the OEB and the IESO that combines the functions of the natural gas system, hydrogen production and electricity system ancillary services.¹³ The plethora of technologies will drive system efficiencies towards greater bulk baseload generation. Planning must build on Ontario’s existing low emitting nuclear and hydro baseload infrastructure and integrate emerging technologies to cost-effectively meet future demand.

Figure 4: Innovation Ideas for a New Energy System



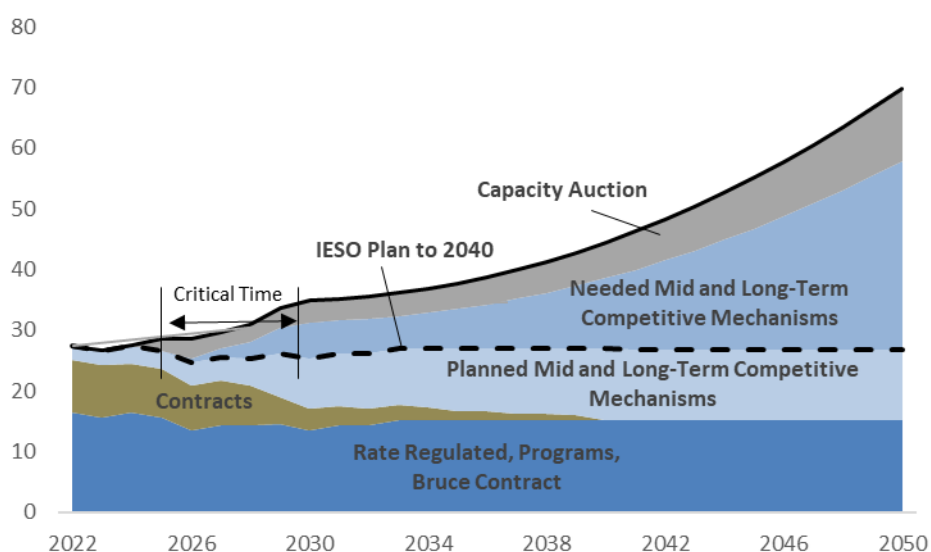
¹³ Enbridge Gas Inc., 2020

3 Sustaining system reliability through the energy transition warrants planning now for the future.

The GRP recommended that policy focus on clear, near-term tangible actions. Tangible actions begin with an improved planning framework that considers maximizing the value of existing infrastructure, identifies the additional energy infrastructure needed to support the NZ transition, and follows up with the appropriate acquisition process.

The backbone of Ontario’s low emission energy future is its hydro and nuclear facilities, which are being renewed for life beyond 2050. Yet Ontario is already facing a sustained long-term supply need for low emitting baseload power that will emerge with the retirement of the Pickering nuclear generation station.¹⁴

Figure 5: Ontario Procurement Needs with Electrification
(MW by Year)



Source: IESO, 2020; Strapolec Analysis

The lack of a low-emissions replacement to the Pickering nuclear generation station is contributing to a forecasted 500% increase in Ontario’s electricity system emissions,¹⁵ which could make it more difficult to achieve Ontario’s 2030 emissions target. The current electricity system resource acquisition framework is not considering the ramifications of a decarbonizing economy.

The near term rise in demand for energy will emerge from business and civil society’s prioritization of electrification alternatives when making decisions: specifically with regards to EVs, Hydrogen, and building heating. These trends will increase the near-term demand for carbon-free electricity.

¹⁴ IESO, 2020

¹⁵ IESO, 2020

In transportation, consumers are choosing EVs and manufacturers are responding. Many passenger vehicle manufacturers have committed to cease fossil-based vehicle production by 2040.¹⁶ Some, such as General Motors, have committed to do so by 2035.¹⁷ EV forecasts based on recent automotive manufacturing statements suggest EV penetration will far exceed that which is currently anticipated in Ontario’s planning.¹⁸

The government of Canada has set a target of 100% EV passenger vehicle sales by 2040.¹⁹ The provinces of Quebec and BC are both more aggressive with equivalent targets set for 2035.²⁰

During discussions with its main union in Canada, Unifor, Ford Motor Co. announced a \$2 billion investment to mass-produce EVs and their batteries in Canada, which is a positive first step in the right direction. This type of investment will accelerate the transition to ZEVs in the province while also increasing electricity demand. This momentum would also benefit from other leading vehicle manufacturers such as Toyota and Honda following suit.

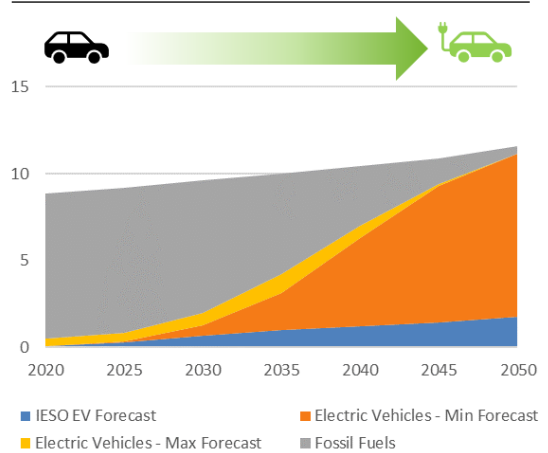
This civil society-induced growth in electrification presents a challenge to sustaining Ontario’s system reliability over the next decades:

- With Ontario’s current 2030 emissions targets of 143 Mt, demand from electrification could well exceed current planning levels by a significant margin – up to 33 TWh before 2030.²¹
- The IESO has already identified that there will be a capacity and energy shortfall in the near term that renewing of existing assets alone cannot meet.²²
- Reliable, firm, low-emitting generation options exist but could take many years to develop.²³

The planning for Ontario’s energy future should consider the timing of when new generation may be required as a result of electrification and develop an approach to secure the requisite low emitting supplies accordingly. The critical time for planning decisions is the next few years.

In the long run, 30 years is not very much time to re-imagine and undertake to more than double the capacity of Ontario’s electricity system infrastructure.

Figure 6: Passenger Vehicle Stock Forecast (Millions)



Source: IESO 2020; Deloitte Insights 2020; Larson, et al., 2020; Strapolec Analysis

¹⁶ Daimler, n.d.; Hyundai, n.d.; White, 2021

¹⁷ Wayland, 2021

¹⁸ IESO, 2020

¹⁹ Canada, 2021

²⁰ Jarratt, 2020

²¹ Green Ribbon Panel, 2020

²² IESO, 2020

²³ Berkeley Lab, n.d.; GE Power & Water, 2015; Hatch, 2013; IAEA, 2012; Tittmann, 2020

CHAPTER 3. Advancing GRP recommendations points to priorities for energy reform

*Considering enabling policies within
Energy Planning is critical to the transition*

Principles Served

- 1 Embracing the urgent need to address climate change is the foundation for action
- 2 **Ontario is well-positioned to build the clean electricity system that can be a cornerstone of Canada's future low-carbon economy**
- 3 Low-cost, low-carbon emission energy represents a competitive economic advantage for Ontario and Canada
- 4 **The enabling policy frameworks must be diverse and require participation from all levels of government and public-private partnerships**

Recommendations Extended

- 4 **Pursue electrification of the economy**
- 8 **Engage the federal financial institutions**
- 9 **Create a federal Next Generation Energy Innovation Fund**
- 10 **Consider public revenue from carbon pricing policy schemes**

4 A new planning framework must ensure affordability while addressing nature of demand, and regional needs

A GRP principal is that low-cost, low-carbon emission energy represents a competitive economic advantage. Reforming Ontario’s energy planning framework presents the opportunity to procure low-cost solutions to meet Ontario’s baseload and variable supply that present less risk and offer more opportunities to reduce emissions.

Demand comes in two forms: baseload and variable. Electrification will increase the need for both beyond what is currently being planned for. Many technology options exist to supply Ontario’s low carbon future. When planning for potential new acquisitions, Ontario must consider the cost implications of each one.

Baseload demand requires firm, reliable, non-emitting supply that is available and affordable 24x7.

- Ontario’s baseload demand relies on its existing dependable, cost-competitive nuclear fleet and hydro assets.
- Emerging low-emitting options include new nuclear, natural gas-fired generation equipped with carbon capture, and renewables firmed up with storage.

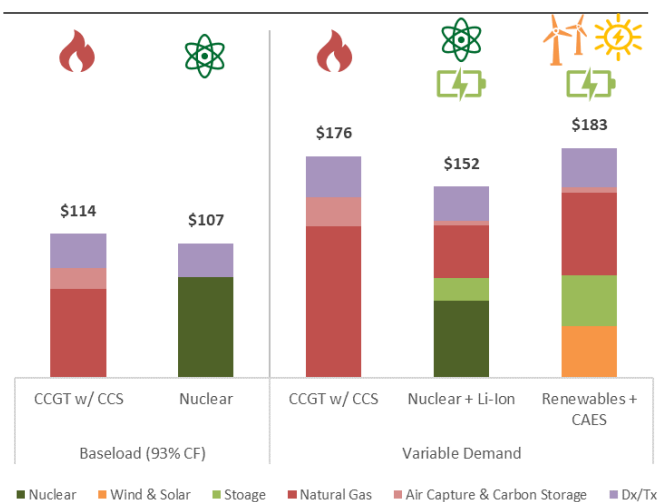
Variable demand requires flexible supply that minimizes the cost of inherently low capacity usage.

- Flexible supply has typically been natural gas fired generation, which if equipped with carbon capture, may remain a viable option.
- However, variable demand can also be met by hybrid solutions, such as integrating the operation of local energy storage technologies with bulk system nuclear, renewables, and Tx assets.
- Many of these hybrid solutions are further enabled by the emerging energy management innovations.

While nuclear is available to cost-effectively provide non-emitting baseload supply, all other options require access to storage for captured carbon. Planning for the future low-cost energy must consider how solutions may be more or less advantageous depending on differing regional characteristics across the province.

To best take advantage of emerging hybrid solutions, including integrated generation, distributed storage, and transmission and distribution assets, plans for resource acquisition could be framed to focus on costs and how well solutions can meet specified regional and bulk demand.

Figure 7: Cost of Options to Supply Baseload and Seasonal/Daily Variable Demand
(\$/MWh, CAD, 2050)



Source: All costs sourced from U.S. National Renewable Energy Laboratory, 2021, and represent 2035 forecasts adjusted for implementation in Ontario. Many costs have significantly lowered, such as nuclear, due to significantly reduced financing costs as a result of expected sustained low interest rate.

A spectrum of policy tools are available to government to accelerate the energy transition in the private sector.

Figure 8: Policy tools to accelerate the energy transition

Group	Policy Tools	Relevance to Electricity Sector
Carbon Pricing	Carbon Pricing	<ul style="list-style-type: none"> Attaching a cost to emitting technologies that may encourage technology switching
	Clean Fuel Standard (CFS)	<ul style="list-style-type: none"> Incenting low carbon fuels and end-use fuel switching <ul style="list-style-type: none"> such as towards EVs and hydrogen vehicles
	Output Based Pricing System (OBPS) / Environmental Portfolio Standard (EPS)	<ul style="list-style-type: none"> Facilitates incremental emissions performance improvements for industry
Financing	Green Bonds	<ul style="list-style-type: none"> Debt financing at preferred government rates for emission reducing projects
	Canadian Infrastructure Bank (CIB)	<ul style="list-style-type: none"> Discounted funding for revenue generating infrastructure projects <ul style="list-style-type: none"> Mix of debt and capital at competitive market rates
	Infrastructure Ontario	<ul style="list-style-type: none"> Possible PPP procurement vehicle to protect interests of rate payers
Strategic Focus	Energy Efficiency & Emissions Standards	<ul style="list-style-type: none"> Updating building codes, appliance or vehicle standards for energy efficiency Direct electrification requirements <ul style="list-style-type: none"> e.g. 100% sales targets for ZEV passenger vehicles by 2040 – Canada, Quebec, B.C)
	Electricity Rates	<ul style="list-style-type: none"> Rate structures can incent consumers to shift demand (e.g. TOU and ICI)
	Strategic Investments	<ul style="list-style-type: none"> R&D support for technology development <ul style="list-style-type: none"> e.g. Ontario's Strategic Innovation Fund Investments in private industry dependent on achieving a strategic goal <ul style="list-style-type: none"> e.g. GM / Ford deals for ZEV manufacturing plants in Ontario
	Subsidies and incentives to promote technology adoption	<ul style="list-style-type: none"> Direct investments or grants to reduce risks or end user costs EV purchase rebates Tax breaks for clean technology (e.g. ZEV trucks)

Source: Strapolec Analysis

5 Planning for an effective energy transition can be aided by government policy tools

A GRP principle is that enabling policy frameworks must be diverse and require participation from all levels of government and public-private partnerships, and require multi-faceted policy levers to support behavioral change, financing, regulation, labor force capability and infrastructure development. The GRP recommended that Ontario engage with federal institutions, consider public revenue from carbon pricing schemes, and place a focus on Canada’s future clean energy game changers.

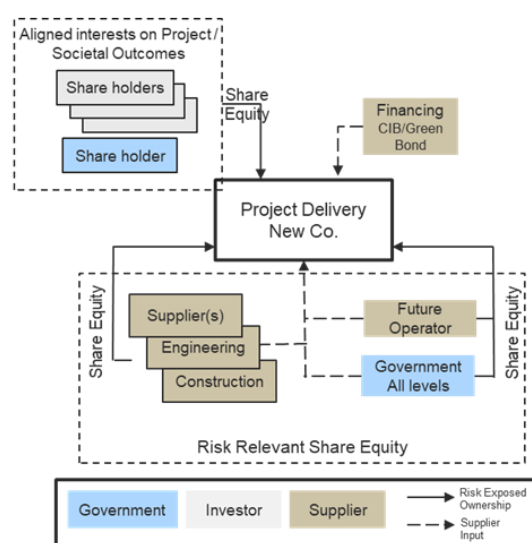
Government policy tools such as the Canadian Infrastructure Bank, Green Bonds, and carbon pricing mechanisms can enable public/private partnerships and creative business models to accelerate the energy transition and reduce government risks.

The essence of a public private partnership is the management and sharing of risk. Leveraging innovations in governance, finance, and regulation can enable creative business models to mitigate risks to both government and the private sector partners of large infrastructure projects, like nuclear new builds.

Mitigation of collective risks reduces the cost of infrastructure projects. The Canadian Infrastructure Bank, Green Bonds, long term energy planning, and regulated returns are enablers of affordable, reliable, and sustainable solutions. By optimizing the risk profile of projects, the private sector may reduce the fiscal burden on government.

Energy planning frameworks should consider infrastructure development tools when establishing planning horizons for the cost-effective acquisition of enhanced existing or new assets.

Figure 9: Enhanced Flexible Public/Private Partnership



Source: Strapolec Analysis

Synergies of policy tools can encourage multi-stakeholder business model innovations by uncovering multiple sources of value. Hydrogen trucking is one such opportunity: with electrolytic hydrogen made from Bruce Power’s clean electricity, hydrogen fuel economics could be better than diesel. Hydrogen trucking may be accelerated by the province’s hydrogen strategy,²⁴ federal purchase incentives for ZEV trucks, the federal clean fuel standard, Ontario’s industrial electricity rates, and regulated rates for blending hydrogen with natural gas. Furthermore, electrolytic hydrogen may be the lowest cost source of reserve capacity for the electricity system.

Effective planning of the energy system will need to consider how policy tools can enable decarbonization, and what public-private partnership solutions can help enact it.

²⁴ Government of Ontario, 2021

6 Planning can leverage energy transition investments to maximize the public benefits for Ontarians

A GRP principal is that Ontario’s clean electricity system can be a cornerstone of the future low-carbon economy. Energy infrastructure planning and acquisition will lead to significant capital spend that can be leveraged to meet further societal goals.

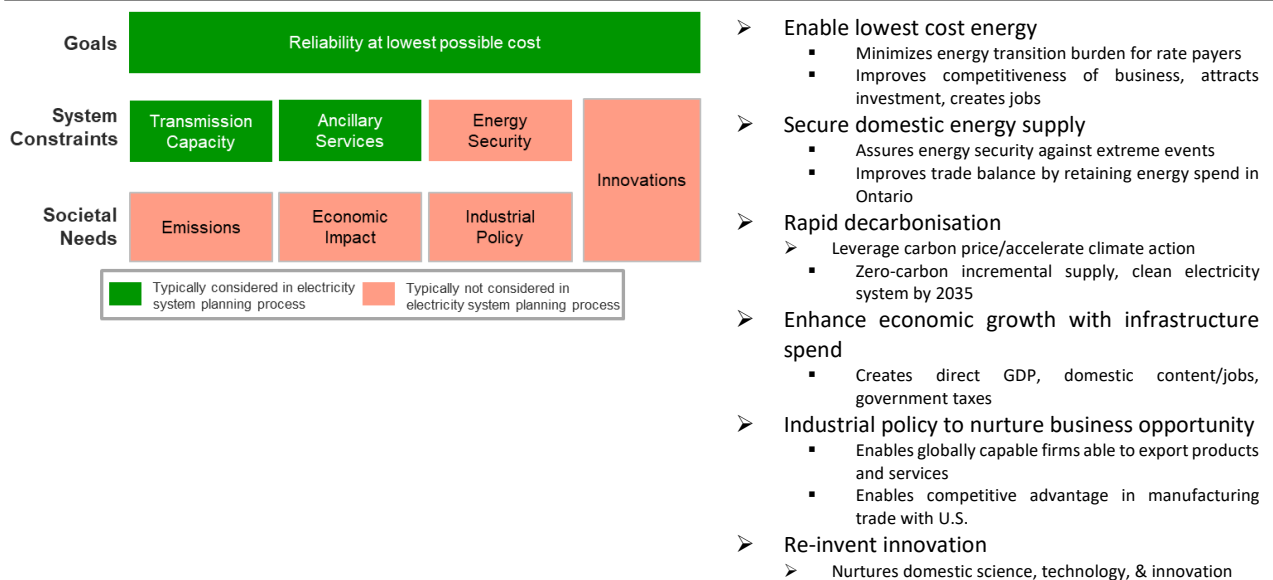
Many aspects of large energy infrastructure development can provide societal benefits. Resource acquisition planning should seek to maximize them all.

Planning for the acquisition of energy system resources should not only address critical direct electricity policy goals such as reliable supply. It should also be optimized across system goals and constraints, and civil society needs.

To maximize the benefits to Ontario of the significant investments, societal needs must form part of the resource acquisition planning strategy. These benefits relate not only to enabling and accelerating decarbonization, but also pursuing energy security, enhancing economic growth, and creating domestic champions through re-inventing innovation.

Policy priorities for such outcomes would benefit the planning process.

Figure 10: Goals, Constraints, and Societal Needs for Planning an Electricity System



Source: Strapolec Analysis

CHAPTER 4. A reformed energy planning framework should respond to policy priorities

A renewed framework for energy reform will reduce government risk and best serve policy objectives

Principles Served

- 1 Embracing the urgent need to address climate change is the foundation for action
- 2 Ontario is well-positioned to build the clean electricity system that can be a cornerstone of Canada's future low-carbon economy
- 3 Low-cost, low-carbon emission energy represents a competitive economic advantage for Ontario and Canada
- 4 **The enabling policy frameworks must be diverse and require participation from all levels of government and public-private partnerships**

Recommendations Extended

- 4 Pursue electrification of the economy
- 8 Engage the federal financial institutions
- 9 Create a federal Next Generation Energy Innovation Fund
- 10 Consider public revenue from carbon pricing policy schemes

7 Energy planning framework reform can be anchored by Government Policy Priorities to optimize the critical role of energy infrastructure in Ontario’s economy.

A GRP principle is that enabling policy frameworks must be diverse and require participation from all levels of government. Policy priorities for energy planning can be informed by inputs from across government ministries, representing the wide-ranging impacts of energy policy.

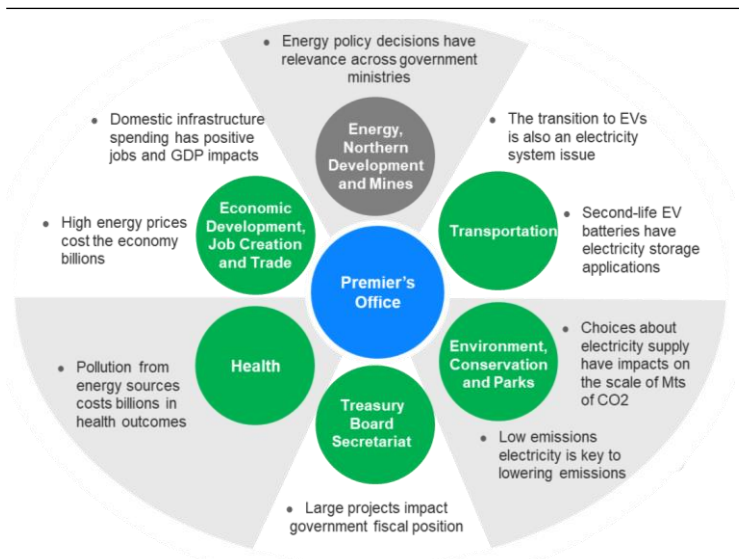
Energy planning is a complex process. Climate change, air pollution, economic development, and technological change are just a few of the factors necessary to consider when dealing with the energy system.

Moving forward it is critical that the planning process reflects government’s policy priorities across multiple sectors.

These priorities should be informed by all government ministries, reflecting the fact that the energy transition is a whole-of-government challenge that spans ministerial portfolios.

Through Policy Priorities, government can transparently set the agenda for energy policy, reduce the risks that lead to the need for government interventions, and lay the ground for effective, accountable implementation of their policies.

Figure 11: Energy and Related Government Ministries



Source: Strapolec Analysis

Figure 12: Sample Policy Priorities

Pressure to Address Climate	Lower Cost to Ratepayers
Emissions intensity of energy system	Minimize system cost
Pace of decarbonization	Rate stability / volatility
Economics of emissions	Competition in procurements
Emerging Fiscal Constraints	Rate competitiveness / fairness
Domestic content & jobs	Cost of extraneous policies
Direct GDP benefit	
Government Financing	Principles
Electricity Supply Reliability	Agency Independence
Energy Security	Transparency & Disclosure
Reliability, NERC, IESO, and technical requirements	Accountability
Complex Energy Transition	Technology Agnosticism
Integration of fossil, electricity, and hydrogen solutions	Indigenous Consultation

Source: Strapolec Analysis

8 Evolving the well-established IESO / OEB roles across the energy transition spectrum can meet the government’s reform objectives.

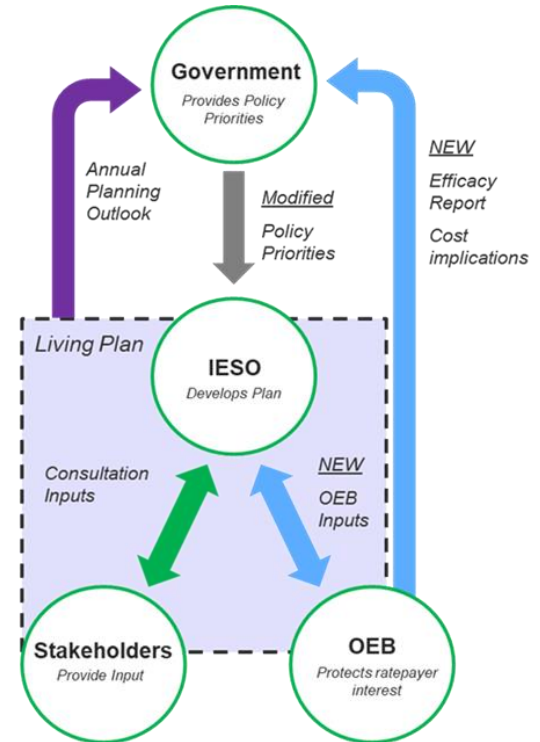
With transparent government policy setting and clear roles for the IESO and the OEB, the energy planning process can be made more accountable and effective.

The IESO’s mandate is to conduct planning, and the OEB’s mandate is to protect the interests of rate payers. There is currently a gap between the outcomes of the IESO’s planning process and the OEB’s mandate: the OEB has no current role in assessing the prudence of expenditures on behalf of rate payers during the planning process, and there are no apparent requirements on the planning process to minimize ratepayer costs.

The government should consider mechanisms on how to address and bridge this gap.

By introducing an accountability mechanism to mitigate cost risks during the planning stage, the government’s effectiveness, transparency, and accountability objectives can be furthered and the cycle of planning failures may be interrupted.

Figure 13: Planning Approach and Possible OEB Role



Source: Strapolec Analysis

9 References

The material in this report has drawn heavily upon the work of Strategic Policy Economics.
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