



# Preparing for the Electricity System of Tomorrow

**IESO Corporate Strategy  
(2022-2027)**





## Table of Contents

**3** Connecting Today. Powering Tomorrow.

**4** Message from the President and CEO

**5** Ontario's Electricity Transformation

**9** Core Strategies

Drive and Guide the Sector's Future

Ensure System Reliability While

Supporting Cost-Effectiveness

Drive Business Transformation

**23** Five-Year Outcomes

**25** Resources

The Independent Electricity System Operator (IESO) has a unique vantage point in the sector as Ontario's electricity system operator. In the coming years, we will see an unprecedented transformation of the system – where the province's reliance on electricity will grow. The IESO is committed to helping drive and guide this transition to ensure a reliable, affordable and sustainable energy future.

# Connecting Today. Powering Tomorrow.

**The IESO works at the heart of Ontario's power system, ensuring that electricity is available where and when it is needed.**

We oversee and evolve the electricity market, driving competition to maintain affordability.

We manage the grid in real-time, balancing supply and demand and directing the flow of electricity.



We plan for the future, forecasting demand and securing the resources required to meet Ontario's energy needs.



## We work with:

**Generators** produce large amounts of electricity to meet Ontario's needs. Ontario has one of the cleanest energy supplies in the world.



**Transmitters** transport electricity over long distances from power plants to communities.



**Local Distribution Companies** (the "local hydro company") deliver electricity directly to homes and businesses in your community.



**Energy consumers** and the communities they live in count on electricity being available.



## Message from the President and CEO

A reliable, affordable and sustainable supply of electricity is fundamental to the prosperity and well-being of Ontario's residents, businesses, institutions and communities. Each and every day, they count on the IESO to ensure electricity is available where and when it's needed.

The value and importance of reliable electricity cannot be overstated. It drives job creation. It powers economic growth. It underpins our communities. And it provides a strong foundation for the modern digital age. In the near future, electricity will become even more central to our quality of life and will offer pathways to decarbonization.

That is why the IESO has an unwavering commitment to meeting Ontario's electricity needs, not just today but tomorrow too.

With every passing year, we continue to find ways to integrate new supply resources, leverage promising new technologies, meet changing customer preferences and priorities, evolve our wholesale markets and protect the grid against increasingly sophisticated cyber threats.

For the IESO to deliver on our mandate, we must have a thoughtful and considered corporate strategy that is informed by broad societal trends and anchored by robust performance measures.

With the increasing pace and scope of change, we felt it was time to refine and recalibrate our plan for the next five years to ensure that we can meet Ontarians' needs and expectations.

The journey ahead will require foresight, agility and discipline. The stakes have never been higher, and we hope you'll join us as we chart a thoughtful path forward for the sector. By working together – industry and communities, producers and consumers, innovators and academics – we will be best positioned to deliver the essential service that Ontario requires today, tomorrow and for years to come.

A handwritten signature in black ink, appearing to read 'Lesley Gallinger', written over a light grey grid background.

**Lesley Gallinger**  
President and Chief Executive Officer

# Ontario's Electricity Transformation

This is a pivotal point for Ontario's electricity system.

Every day of the year, Ontario residents, businesses and communities rely on this critical commodity. However, there are fundamental changes underway that affect every aspect of the power system and the wholesale market, including consumer preference, government policy, technology maturation, economic activity, investor priorities, workforce demographics and more.

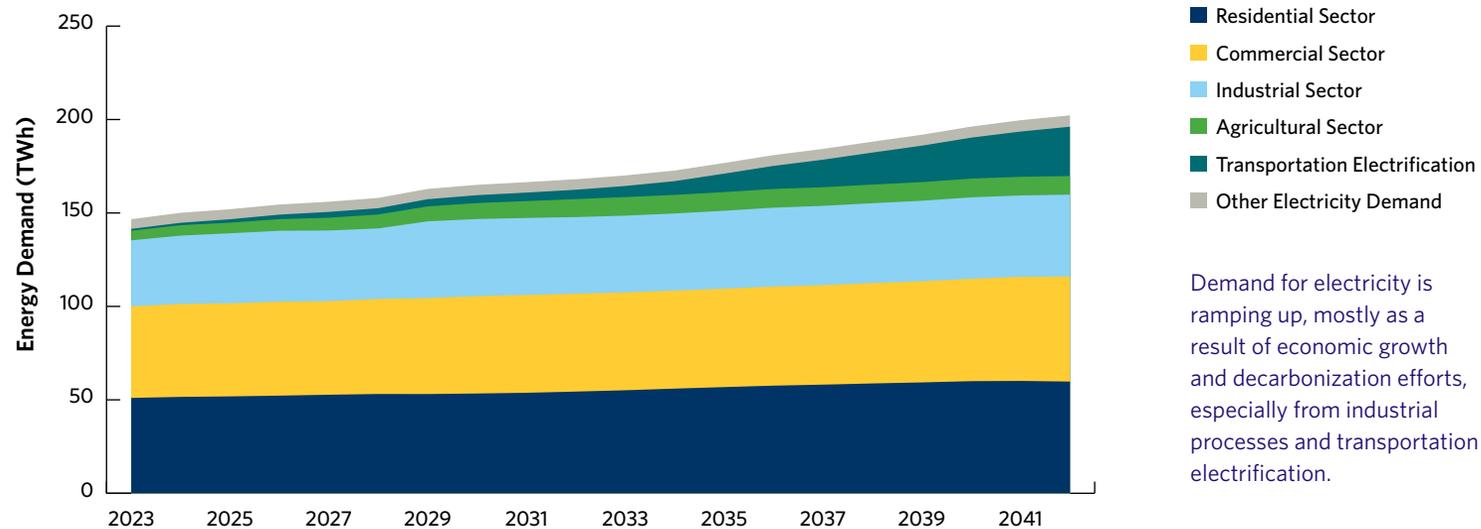
Positioned as we are at the heart of Ontario's electricity sector, the IESO plays a vital role in managing these changes and many more. Our work impacts how electricity is produced and consumed, how it is transmitted and distributed, and how it is planned for over the longer term and managed on a second-by-second basis to ensure the province's needs are met at all times.

## A growing reliance on electricity

After more than a decade of strong supply, Ontario is entering a period of emerging electricity system needs, starting in the mid-2020s. These energy and capacity needs will continue through 2040, with demand expected to increase by nearly two per cent

per year during this period. Growth in the industrial, mining and agricultural sectors, as well as major expansion in transportation electrification, will collectively drive higher electricity demand than Ontario has seen in many years.

Long-term demand forecast (by sector)



Demand for electricity is ramping up, mostly as a result of economic growth and decarbonization efforts, especially from industrial processes and transportation electrification.

These demand increases are being compounded on the supply side by nuclear retirements and refurbishments as well as the expiration of a large number of generator contracts. Needs are emerging as early as 2025, and the IESO is moving forward with a variety of approaches to ensure there is adequate supply.

Our goal is to ensure Ontario continues to benefit from a diverse supply mix going forward. Diversity in energy supply strengthens the reliability and resilience of Ontario's power system. Maintaining a varied and robust resource mix will continue to underpin the reliability of Ontario's power system while leveraging the strengths of each unique type of resource.

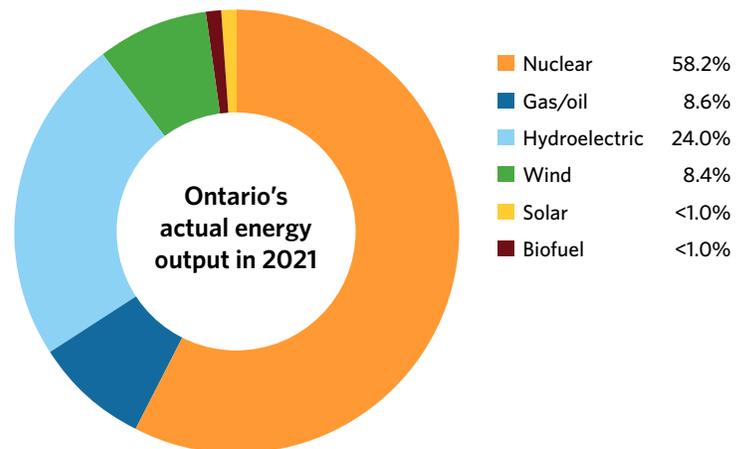
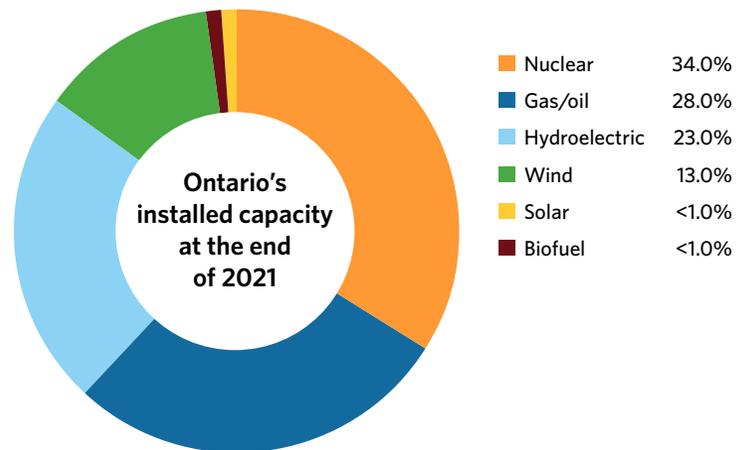


Ontario's demand for electricity can fluctuate throughout the day by as much as

**10,000 MW,**

requiring different resources to perform different roles at different times.

Ontario Capacity and Energy Output in 2021



### Leveraging competition to drive down costs

The IESO has worked with sector stakeholders to develop a Resource Adequacy Framework to address these evolving reliability needs in a cost-effective and flexible manner that balances ratepayer and supplier risk.

We remain committed to using competitive mechanisms to meet Ontario's resource adequacy needs and are working with stakeholders, communities and others to deliver on this framework.

To facilitate competition and provide business planning certainty, the Resource Adequacy Framework provides the IESO with multiple tools to address our system needs over the short-, medium- and long-term. The different tools include a capacity auction to continue to meet short-term capacity needs in a flexible manner, medium-term procurements for resources that can provide reliability services to the IESO over a multi-year period, and long-term procurements that are focused on incenting investment in incremental and new resources to provide developers with a stable source of revenue to ensure supply.

To help meet these growing needs, one area of great interest is distributed energy resources (DERs), small-scale resources that produce, store or manage electricity and are connected to a local distribution grid or a customer's premises. DERs have the potential to increase grid reliability, support affordability and ensure competition, while delivering value to consumers.

### Renewing the wholesale market

Ontario's wholesale electricity market, like all energy markets, has a foundational objective of maintaining reliability at the lowest cost. With the sector transformation to come, efficient markets will play an even more critical role. As we see an increasingly diverse and decentralized system of resources, we need to ensure the market, and all of our systems and processes, are positioned to support this transformation. Through our Market Renewal Program (MRP) and other related initiatives, we are modernizing our markets by rebuilding our market platform and systems to ensure efficient use of the growing number of resources that supply electricity to Ontario consumers.

The changes we are making through MRP will ensure our market is robust, transparent and competitive. The refreshed market will also provide the price signals needed to schedule resources as efficiently as possible and maximize value to Ontario ratepayers.



**Over \$20 billion**

flow through the IESO-administered markets each year.

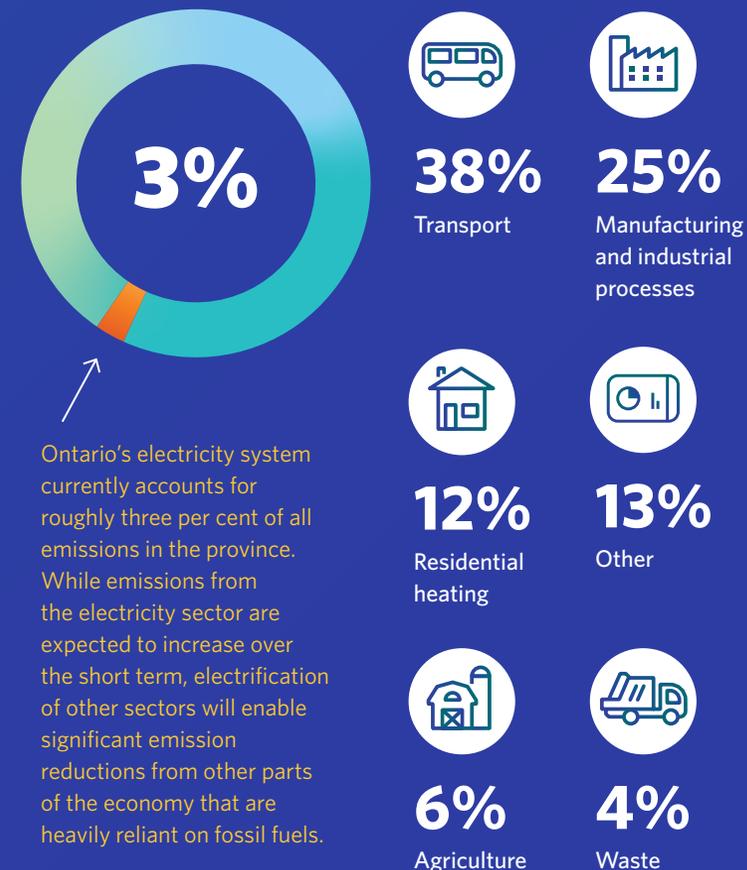
### An emphasis on sustainability

As efforts to reduce emissions across all sectors continue to accelerate, the coming decade will see a rapidly-changing electricity landscape in Ontario. Today, Ontario's electricity system is among the cleanest in the world, accounting for less than three per cent of the province's total greenhouse gas (GHG) emissions.

Reducing GHG emissions has emerged as a high priority for Ontario residents, businesses, institutions and communities. A growing number of consumers are looking for ways to reduce their carbon footprint by investing in technologies that include electric vehicles, heat pumps, induction stoves and other devices. Many industrial and commercial customers are exploring ways to electrify their operations and reduce their reliance on natural gas and other fossil fuels, not only to achieve cost savings but also to meet environmental, social and governance (ESG)-related objectives. At the same time, a number of municipalities across Ontario are implementing major energy-efficiency projects and also testing electric transit systems as part of their own climate-change mitigation strategies.

To that end, and at the request of the Minister of Energy, the IESO is developing pathway(s) to further decarbonize the electricity sector. This work will consider a number of factors, including cost/affordability, timing, new technologies and the impact on broader electrification of the economy, among others.

### Greenhouse gas (GHG) emissions by sector\*



\*Percentages have been rounded and as a result will not add to 100.

### Driving and guiding sector change

We are actively working to integrate emerging technologies and enable new resources to participate in the IESO markets. For example, pairing energy storage with wind or solar generation can improve operational efficiency and help meet the province's emerging electricity needs. For this reason, the integration of hybrid storage/generation resources has been designated a priority project within the Enabling Resources initiative.

Through active engagement with stakeholders and communities, we have already made great strides. Changes to the participation models will be fully implemented after our MRP goes live. We are also working with sector partners to reduce the barriers to storage resources and evolve the relevant policies, rules, processes and tools to better enable the integration of storage resources within the current structure of our market.

Enabling more resources to participate in our markets will increase competition, drive down costs, and provide new and sustainable options as we study pathways to decarbonization.

Looking ahead, we will strive to support the transformation of Ontario's electricity system by driving and guiding the future of the sector. While at times it is best to lead from the front, charting a path for others to follow, it is also important to create opportunities for others to lead and pave the way when appropriate.

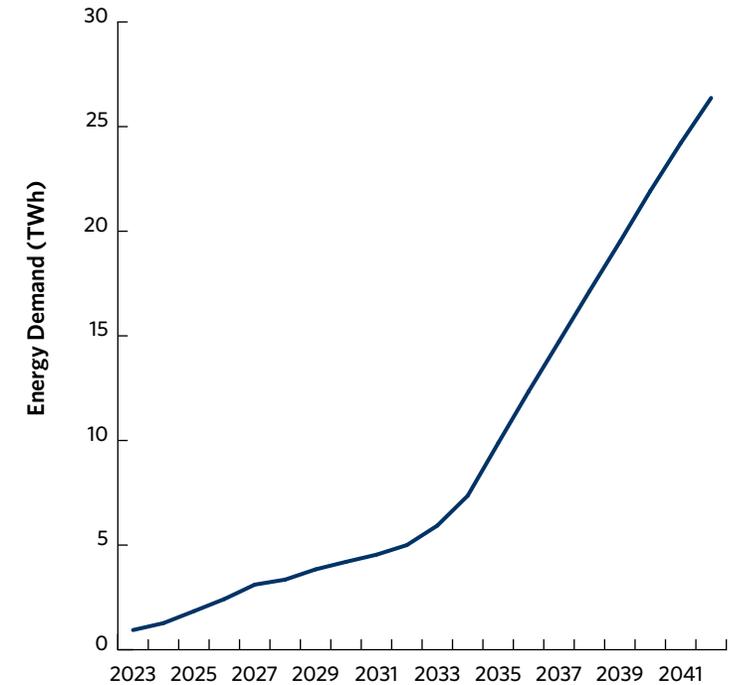


Distributed energy resources could meet

**up to 12%**

(4.3 GW) of Ontario's summer peak demand by 2032.

### Electric vehicle electricity demand forecast



Projected demand for electricity rises rapidly in the early 2030s as a result of large transit electrification projects, government incentives for both industry and consumers, and an ongoing shift to electric vehicle (EV) offerings by auto makers.

# Core Strategies

Electricity is the driving force behind Ontario’s economy, supporting growth and quality of life for the province’s residents and communities.

The IESO is here to ensure the province’s power system can reliably and sustainably deliver this essential resource. By working collaboratively and purposefully with market participants, municipal officials, Indigenous communities and a vast range of other partners, we operate for today, plan for tomorrow and prepare for the future.

We are setting a course for a future state that is decarbonized, decentralized and digitalized. Although some aspects of this journey are not yet known with certainty, the IESO is resolute in our commitment to supporting Ontario’s energy transition – leading change in some areas, but also facilitating our partners’ leadership in other areas.

## Purpose

We are at the heart of the electricity system, ensuring affordable electricity is available where and when Ontario needs it.

## Vision

To be the trusted leader that drives and guides Ontario’s electricity transformation.



### Drive & Guide the Sector’s Future

- 1.1** Strengthen Stakeholder and Indigenous Communities Engagement & Relationships via Purposeful, Transparent Outreach
- 1.2** Identify, Anticipate and Respond to Changes in Customer Choice and Policy
- 1.3** Advise on and Actively Participate in Dialogue on the Configuration of the Future-State Sustainable Energy System



### Ensure System Reliability while Supporting Cost-Effectiveness

- 2.1** Renew the Real-Time Markets to Advance Energy Transformation
- 2.2** Adapt the IESO’s Short- and Long-term Planning to Meet Evolving System Needs
- 2.3** Cost-Effectively Acquire Services to Maintain Reliability in the Evolving Sector
- 2.4** Champion Cyber Security, Situational Awareness and Best Practices within the Sector



### Drive Business Transformation

- 3.1** Define and Enhance our Desired Culture and Employee Experience
- 3.2** Identify and Build Next-Generation Skills and Competencies
- 3.3** Evolve the IESO’s Business Processes, Technologies and Tools



## Drive and Guide the Sector's Future

We will drive and guide the sector's future by strengthening relationships with stakeholders and Indigenous communities, effectively responding to changes in customer choice and policy, while acting as an advisor and participant in discussions on how to create the sustainable, future-state energy system.

Ontario's energy transition is transforming the ways in which electricity is planned, produced, delivered and consumed. The IESO has a fundamental role to play in ensuring the province has the electricity it requires to meet the needs of today and tomorrow.

To do so, we work closely with partners from across this sector and beyond with a view to forecasting and facilitating the changes that are afoot. The forces impacting supply and demand for electricity are many and varied, including economic, environmental, social and technological, to name just a few.





## Strengthening our relationships

The essential link connecting all of the IESO's current and future activities is engagement. This includes traditional sector stakeholders as well as a vast and varied array of other parties who influence our planning and decisions, including Indigenous communities and organizations, business and industry leaders, trade associations, academic institutions and other orders of government. Each group has a unique role to play in the system, with its own specific needs, interests and priorities.

At all times the IESO must work to understand the nature of these forces driving transformation and make informed decisions that strike an appropriate balance. In planning for the future, we must carefully weigh diverse interests and plot a course that considers the interplay among them.

With every passing year, more voices are joining the energy conversation. Through our engagement processes, we strive to make balanced decisions – decisions that are effective and appropriate, and that will stand the test of time. Over the next five years, we will continue to engage in a targeted and transparent manner, consulting different groups through thoughtful means and mechanisms.



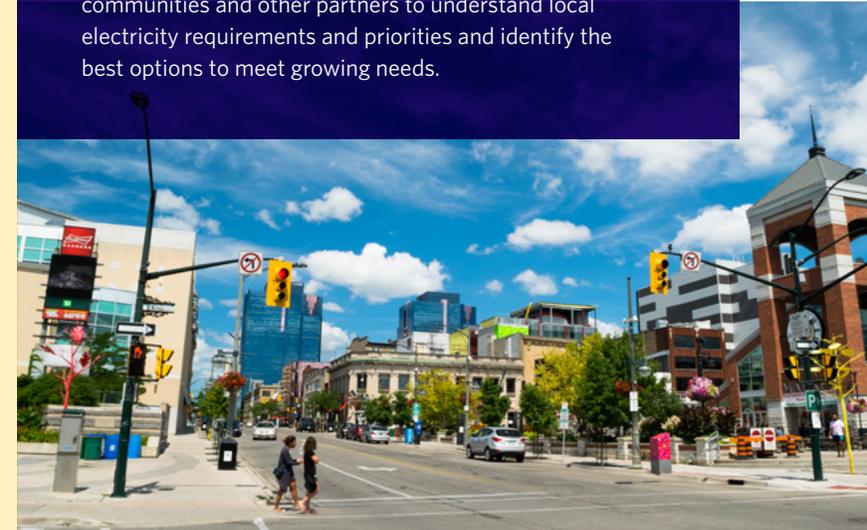
The IESO works closely with stakeholders and communities to ensure informed and balanced decisions are made about Ontario's energy future.



There are more than **5.3 million** electricity customers in Ontario – most of which are residential.

## Regional and Community Engagement

A reliable supply of electricity is essential to supporting community growth – powering homes, schools, businesses, hospitals and transportation. Engaging with communities is an important part of maintaining a reliable electricity supply, now and in the future. The IESO works closely with municipalities, regional governments, Indigenous communities and other partners to understand local electricity requirements and priorities and identify the best options to meet growing needs.



Active dialogue with local residents, business owners and community leaders helps the IESO understand the unique circumstances of different regions in Ontario.



## Responding to customer needs and policy decisions

Consumer preferences and choices are some of the key drivers behind the energy transition that is underway. As the province's reliance on electricity increases through economic growth and the transition to non-emitting energy sources, the IESO will continue to support this shift while maintaining reliability and affordability.

As a result, our development activities are focused on meeting consumer demand while respecting customer preferences, including new supply options to meet our growing needs. This includes testing concepts such as residential microgrids, local energy markets, aggregated electric vehicle (EV) charging solutions, strategic energy management and artificial intelligence, to name a few.

Given the scope of the supply challenge, we are accelerating our efforts to integrate DERs into Ontario's electricity grid and market. These small-scale community-based facilities have the potential to deliver flexible and affordable solutions to local supply issues while also meeting regional and provincial needs.

We will continue to prioritize energy efficiency, the cheapest and most sustainable resource available. The IESO's Save on Energy programs have reached homes and businesses in all sectors across Ontario, saving enough energy over the last decade to



The shift to electric vehicles is expected to accelerate in the 2030s and substantially increase demand for electricity.

power 1.7 million homes for one year. Looking ahead, conservation and demand management will play a growing role in meeting our reliability needs with targeted programs that help address provincial and local reliability concerns.

Through our Pathways to Decarbonization project, we are working closely with stakeholders, communities, technical experts and other interested parties. We have been directed to evaluate a moratorium on the procurement of new natural gas generating stations in this decade and develop an achievable pathway to phase out natural gas generation and achieve zero

## York Region Local Energy Market

An innovative demonstration project in York Region is enabling the IESO, Alectra and NRCan to test local solutions to local electricity constraints. Homeowners, supermarket operators, manufacturers and other providers were among the winning proponents in local energy auctions to supply electricity in York Region, where demand for electricity is likely to exceed local system capabilities within the next 10 years. By operating in real-world conditions, the project has enabled us to better understand the potential of using these resources in place of traditional wires-based infrastructure.



A two-year project in York Region has demonstrated the value of using small-scale resources to meet local energy needs.



emissions in the electricity sector. Our analysis will consider reliability; cost/affordability; timelines; impact on broader electrification of the economy; low-emission fuels for thermal generation; storage combined with non-emitting resources; and other new technologies.

To ensure diverse perspectives are considered, we are engaging broadly. This engagement provides a focus for concrete conversations about how to eliminate emissions from our system while balancing the need to maintain reliability as other sectors also decarbonize through electrification. The IESO will offer its expertise as part of this dialogue, encouraging a common understanding of the issues at hand and bringing a variety of perspectives to the table. Given our role as system integrator, we must ensure all voices are heard and all ideas are considered.



There are more than

**3,000**

Electricity Network members across Ontario that provide valuable insights on electricity planning in their communities.

## Fostering a dialogue about our energy future

Ontario's energy future will be shaped by the conversations and insights shared through our engagement framework. What our electricity system looks like in five, 10 or 20 years' time will be influenced by our sector's ability to collaborate and contribute to an understanding of what is needed to evolve the system further.

For example, the DER roadmap that sets out the IESO's goals, objectives, initiatives and timing for DER integration reflects our engagement with stakeholders - and provides the IESO with clear targets for three key focus areas: wholesale market integration by 2026, transmission-distribution coordination and enabling non-wires alternatives.

The evolution of Ontario's electricity system will involve a broad range of parties. The IESO is committed to working with market participants, sector stakeholders and regulatory bodies to ensure roles, responsibilities, processes and structures are clearly articulated and capable of supporting growth and development within the sector.



## Supporting Indigenous energy leadership

Indigenous communities and organizations in Ontario are one group with whom our engagement is deepening. Our work in this area is focused on powering change – and changing lives.

Now more than ever before, many Indigenous leaders across Ontario are pursuing projects that support greater energy independence and provide new opportunities to create local revenue and jobs.

By developing generation and storage systems, becoming equity partners and leaders in major infrastructure projects, prioritizing energy efficiency as a way to demonstrate environmental stewardship, and engaging in important conversations about system planning, Indigenous communities are seeking – and achieving – greater autonomy and becoming catalysts for change.

The IESO is proud to stand beside our Indigenous partners on this journey to greater self-determination and economic opportunity. Continuing to develop Indigenous capacity is an important step towards a longer-term goal of achieving economic reconciliation and driving fair, equitable and inclusive participation in the energy sector.



By taking greater control of their energy future, Indigenous communities and organizations are driving local economic development and job creation.

## Increasing Indigenous participation in Ontario's energy sector

By participating in initiatives such as the IESO's Energy Support Programs, Indigenous communities and organizations across Ontario are transforming how they meet their energy needs, choosing cleaner, more reliable and more affordable options.

For example, Dokis First Nation is developing a solar/storage system that will be connected to the Band's community centre/school (Kikendawt Kinoomaadii Gamig) complex. The system will interface with the existing diesel generator as backup, and provide over 85 per cent of the facility's total energy needs. The project includes local training on the design, installation, operations and maintenance of this innovative system.





## Ensure System Reliability While Supporting Cost-Effectiveness

To ensure system reliability while supporting cost effectiveness, we will transform the real-time markets and adapt our planning processes, cost-effectively acquire services and champion cyber security.

When Ontario's wholesale electricity market opened 20 years ago, the electricity landscape looked very different. Electricity was produced by a relatively small number of centrally located generating stations, carried over long distances across high-voltage transmission lines, and distributed by local utilities to homes and businesses across the province.

Times have changed. Today, Ontario's electricity comes from a growing number of resources, including significant amounts of small-scale local generation. Local distribution companies have become increasingly consolidated. Technology companies and other innovators are disrupting every aspect of the business and electricity users have become much more engaged and involved, taking on a more active role in their own consumption decisions.





The IESO control room oversees the provincial power system and market in real-time.

## Evolution of the wholesale markets to advance energy transformation

As the landscape has changed, so too have our markets. The opening of the wholesale market in 2002 introduced an important new force: competition. By establishing a model where electricity suppliers compete to meet the province's electricity needs, the IESO has ensured Ontarians benefit from a more dynamic and cost-effective system.

Competition is a thread that connects many of the IESO's activities – and is expected to play an even greater role in future operations. The IESO's MRP is introducing fundamental reforms

to the province's electricity markets to improve how we supply, schedule and price electricity to meet Ontario's future needs at the lowest cost.

The market of the future must accommodate a range of new resource types, often with different attributes and operating characteristics than our existing fleet. Given the ongoing transformation of the system, the market must be flexible enough to support the integration of new sources of supply, accommodate changing policy imperatives and consumer preferences, stimulate investments in new supply as required, and deliver the most economically efficient outcomes.

## Maintaining reliability and cost-effectiveness

Beyond the wholesale market, competition is expected to dominate other aspects of our business in the years to come, including the procurement of existing and new resources to meet Ontario's rapidly increasing demand for electricity.

Through our Resource Adequacy Framework and our Enabling Resources Program, the IESO is taking steps to expand, enhance and modernize Ontario's power system. Short-term needs will generally continue to be met through capacity auctions, while medium- and long-term needs will be met through RFPs, and where there are no viable alternatives, bilateral agreements will be considered.

We are securing resources, testing new integration models and re-examining our systems and processes to reduce barriers to entry with a view to ensuring we derive the greatest value from new and emerging technologies.

This essential work will play out over several years, resulting in a system that is more flexible, resilient and diversified.



An increasing number of electricity resources such as small-scale solar generation are connecting directly to the local distribution grid. Engaged consumers and communities investing in these local resources are leading to a more diverse and decentralized system.



## Changing system needs

One operational challenge the IESO must manage is that electricity needs are not static. Rather, they are subject to a broad range of forces and variables. The dynamic nature of Ontario's electricity requirements means the IESO must take a flexible and responsive approach to planning the system. We must have the ability to identify, react and adapt to changing circumstances.

When it comes to electricity planning, understanding what's important to consumers, communities and businesses at the regional level is critical. Every region of the province has unique characteristics and energy needs, which the IESO must understand, consider and plan for.

Over the next five years, we will continue to adapt our short- and long-term planning processes to meet evolving system needs – not just for the province as a whole, but for its many regions and individual communities. We will identify system needs and opportunities, monitor evolving technologies and supply options, and effectively plan transmission so that electricity is available where and when it is needed.

We understand the need for clear roles and consistent information, and our annual planning and reporting processes are helping to provide transparency. We're now in our third cycle of the Annual Planning Outlook establishing the province's



Each region of Ontario has its own needs, interests and priorities, which the IESO considers through its planning processes.

electricity needs and the Annual Acquisition Report laying out our acquisition plans, which will help ensure broad understanding of the big picture for electricity in Ontario.

Significant follow-up work on the Pathways to Decarbonization project will also be required in the next several years. A rapidly evolving policy landscape, coupled with decisions driven by environmental, social and governance considerations, are expected to impact our planning work. The IESO must consider a broad range of potential policy decisions and outcomes, together with an evolving mix of potential resources and demand forecasts.

## Transmission planning enhancements

To meet future system needs, the IESO will be recommending a relatively large number of transmission projects in the coming years. For reliability purposes, it is imperative that these projects be completed on time. For this reason, we will put more emphasis on monitoring the implementation of our plans, understanding any potential implementation risks and taking action to ensure long-term reliability, if needed.

By working closely with our partners, we will proactively identify where in the province new, large customers are likely to connect and then develop transmission plans to supply those sites. This foundational work is critical to enable economic development and ensure the necessary supply chains exist to support the energy transition.





Every region has its own specific needs and interests. To ensure electricity infrastructure gets built in a timely manner, we need to ensure all our partners understand the urgency of the situation. We will focus on increasing the transparency of our transmission planning processes to ensure all affected stakeholders, communities, utilities, residents and businesses know what we are contemplating – and why.

In addition to transmission and other conventional solutions, we are also taking steps to improve how we identify and assess DERs and other non-wires alternatives. Given their flexibility and lower development costs, these technologies will undoubtedly become more important as Ontario transitions to a cleaner energy supply mix. There will, however, continue to be situations when transmission solutions (poles, wires and stations) will be the only viable option.

### Championing cyber security

Amidst all these changes, the IESO must remain vigilant against cyber security threats. Cyberattacks are becoming more common and more complex with every passing year. For this reason, the IESO continues to work closely with sector partners to share information and deepen situational awareness. The safe and reliable operation of Ontario's power system is built upon a large, decentralized supply chain – and we are already taking steps to reinforce the entire length.



Protecting Ontario's critical cyber assets is a shared priority for Ontario's electricity sector.

Given the rate at which cyber risks are increasing, this work will continue for the foreseeable future. Ransomware, malware, social engineering and phishing are the most common ways that bad actors try to access the grid – but this is not unique to Ontario. In fact, it's a global phenomenon and a broadly shared concern. We will remain vigilant and continue to collaborate with experts from around the world to identify, mitigate and minimize the collective risks to reliability.

### Cyber security services for the sector

Protecting the grid against cyber vulnerabilities is of paramount importance. In 2019, the IESO became the first system operator in North America to be accountable for providing cyber security-related services to the broader electricity sector. Lighthouse, the cornerstone of our cyber offerings, provides a near real-time view into threats and incidents that can impact the power grid. Designed to improve the security and resilience of the system, this detection, assessment and information-sharing service is the result of a one-of-a-kind partnership with the Canadian Centre for Cyber Security, a trusted federal source of cybersecurity information, advice and guidance that builds on the IESO's existing leadership and capabilities.





## Drive Business Transformation

To drive business transformation, we will evolve our internal processes, technologies and tools, identifying and building next-generation skills and competencies while defining and enhancing the IESO culture and employee experience.

Electricity is a vital economic enabler and is essential to the quality of life of all Ontarians. To fully deliver on our mandate and position Ontario for growth and prosperity, the IESO has prioritized hiring some of the best and brightest in the electricity sector. We have a highly skilled and diverse workforce whose functions run the spectrum from real-time operations to long-term planning, from cyber security to financial management, and from wholesale market development to compliance and enforcement.





### Enhance our culture and employee experience

Our organizational success is underpinned by our employees. For this reason, we are taking concrete steps to evolve our corporate culture and enhance the employee experience.

Our vision is to create a sense of belonging, where diverse expertise and perspectives are valued. To achieve this, we must operate in a fair and consistent manner, make employees feel safe challenging the status quo, and ensure corporate values are reflected in the attitudes and behaviours of our workforce. IESO employees have a strong sense of purpose, and we are making the necessary investments in our people and our workplace to enable them to deliver results that support this purpose.



A robust learning and development program helps to build leadership skills at all levels.

### Building skills for the future

Ensuring our employees have the skills they need to excel in a changing environment is a high priority. Learning needs change over the course of every career. For this reason, we offer learning and development opportunities for staff at different points in the employee life cycle. Although some training content is tailored to meet the needs of employees at specific levels in the organization, we firmly believe leadership can be found across the IESO. It is a skill we plan to nurture, as all employees have a role to play in helping the IESO achieve its strategic objectives.

Internal capacity building will be even more critical in the years to come. By making strategic investments in learning and development, we are taking steps towards driving engagement, commitment and loyalty.

We are also developing plans to attract, engage and retain top-level talent in certain key areas, including cyber security, data science, artificial intelligence and machine learning, economics, contract management, and stakeholder and community relations, among others. We will also focus to a greater degree on succession planning and strengthening inclusive leadership capabilities.

As is the case with many of our sector partners, the IESO is experiencing a demographic shift with the planned retirement of some long-term employees. We are actively recruiting from top

### Promoting cultural change

To deepen our shared understanding of the challenges faced by under-represented and marginalized groups, the IESO has embarked on partnerships to provide employees with access to tools and capabilities to promote equity, diversity and inclusion (EDI).

Given their criticality, EDI considerations have also been fully embedded into our corporate values and strategy, as well as our learning curricula. Tailored training programs have been developed for all levels of the organization, starting with our executive team and senior leaders and cascading to all employees. This will be an important contributor to our long-term plan to drive business transformation.

We are dedicated to creating a more equitable, diverse and inclusive workplace. While we are on our own journey and are making progress to achieve these goals, this is an issue the sector as a whole is working to address.

#### VALUES:



Expertise with Humility



Purposeful Engagement



Commitment and Accountability



Openness to Change



Genuine Caring



Collaboration and Teamwork



academic institutions to ensure we continue to have staff with the optimal combination of skills, experience and passion to drive the organization forward.

To deliver the best results, employees need to be future-oriented, solutions-driven and capable of responding positively and effectively to changes in the environment. They also need the right tools and technologies to do their work.

### Next-generation tools and technologies

Complex information technology programs and tools enable us to perform essential tasks that include forecasting demand, dispatching resources and monitoring the grid for cyber threats. After years of deferring investments, many of the IESO's IT systems require renewal as they approach their end of life. Some of these upgrades will be made to control room systems to support the integration of emerging resources, and to improve situational awareness. In the coming years, we will continue to update or replace many of these key IT systems that help us maintain the reliability of the grid.

Settling the market, for example, is a critical function that requires sophisticated software. Over \$20 billion in transactions occur each year through Ontario's wholesale electricity markets and it is imperative that these transactions be settled accurately.

Replacing our settlement system will also address market re-design needs associated with implementation of the MRP and ensure our systems meet current and future business needs.

Good decisions require good data. Given our central role in managing the power system and the scope of our IT tools and systems, the IESO has access to a wealth of operational electricity data stretching back to the opening of Ontario's electricity market in 2002. When fully utilized, this data can provide unique insights into the complex inner-workings of electricity production, usage, planning, forecasting and much more.

Furthermore, the profound transformation of the energy sector fueled by the proliferation of DERs, accelerated electrification and increased storage solutions, demands a new approach to data and analytics – one that is anchored in advanced technologies capable of capturing vast quantities of operational data at a very granular level, processing it at high speeds and producing critical insights and information.

### Sharing expertise

As electric vehicles, energy storage, demand response and other types of DERs become more prevalent in Ontario and around the world, the IESO's DER technical leads are working with academic experts to share insights that will help others better understand, manage and leverage DERs in their communities. Four papers with IESO input were recently published in IEEE (Institute of Electrical and Electronics Engineers) journals on the topics of regulation signal design, frequency regulation for energy storage, improved energy modelling and DERs as non-wires alternatives. Contributing to a global understanding of the challenges and opportunities associated with DERs is one way for the IESO to guide the sector and support reliability on a much broader scale.



A third-party analysis of 27 past innovation projects showed that if those technologies were adopted more widely across the province, they could reduce system and customer costs by

**\$500 million**



## Extracting value from data

In 2019, the IESO embarked on a rigorous effort to evolve our data and analytics maturity level and capabilities. By developing a data strategy and enterprise data catalogue, the IESO is treating organizational data as an invaluable business asset. We intend to leverage this data to identify additional market efficiencies, support reliable grid operations and improve our risk management practices.

Separately, the Smart Metering Entity (SME) of the IESO is also proceeding with efforts to extract the full value of Ontario's smart meter data. This data has already provided valuable insights in a number of areas, including electricity demand forecasting, to better understand the impacts of the pandemic on residential use. Going forward, it may also be leveraged for conservation and demand management program design, distribution rate design and pricing models, and transmission and distribution system planning, among other applications.



The IESO has access to vast quantities of operational data, which have the potential to benefit the electricity sector and other users.

## Five-Year Outcomes

The world will be a different place five years from now – and as recent history has taught us, it's important to expect the unexpected. Nevertheless, there are a few things we can predict with confidence.

Ontario's supply mix will continue to change, with existing and new resources providing energy, capacity and ancillary services. The electrification of the economy – especially transportation and industrial processes – will be widespread. The journey to decarbonization will be well underway. A growing number of consumers will be investing in new technologies to enable more active energy management, and local energy solutions will be more common, complementing traditional poles-and-wires-based options.

By 2027, there will be a host of new players in the electricity market taking advantage of the lowered barriers to entry and participation. DERs will be competing on a more level playing field with existing large-scale suppliers, helping to meet local, regional and province-wide energy requirements.

To meet medium- and long-term reliability needs, our planned resource procurements will be well underway and at different stages of their implementation. Some existing resources will have facility expansions in service, while new resources may still be under construction. We will also have continued to enhance our

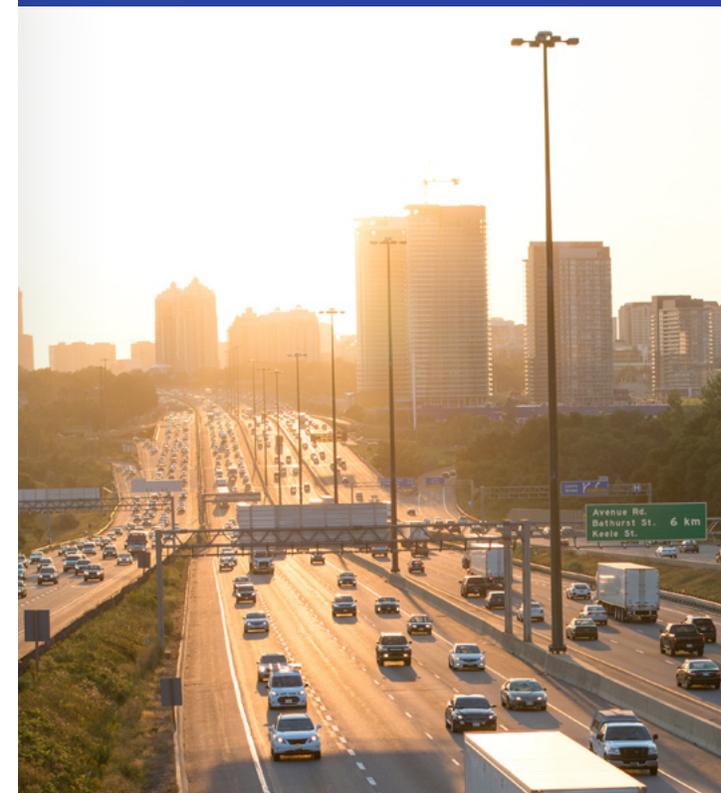
capacity auction to ensure near-term needs are met and a broad array of capacity providers are eligible to participate. Through a variety of different means – capacity auctions, procurements and other mechanisms – we will have laid the foundation for the grid of tomorrow.

The IESO's MRP will be fully implemented. Our business case currently indicates net benefits will reach at least \$800 million during the first 10 years – and will continue well beyond that period.

These benefits stem from aligning price and dispatch, and reducing the need for out-of-market payments; reducing the risk of market manipulation; providing good quality information to drive investments; implementing changes that will address emerging system needs; and enabling greater competition between resources. The benefits of MRP will extend to the system, the sector and ultimately consumers.

We will also be closer to fully leveraging the capabilities of technologies like energy storage. By enabling these resources to participate in our markets more effectively, we will be supporting reliable, affordable and sustainable operations.

As noted, a reliable power system is the cornerstone of modern society. It is the foundation on which our economy is built and our quality of life depends. Given the interconnectedness of the



Our EV forecast projects

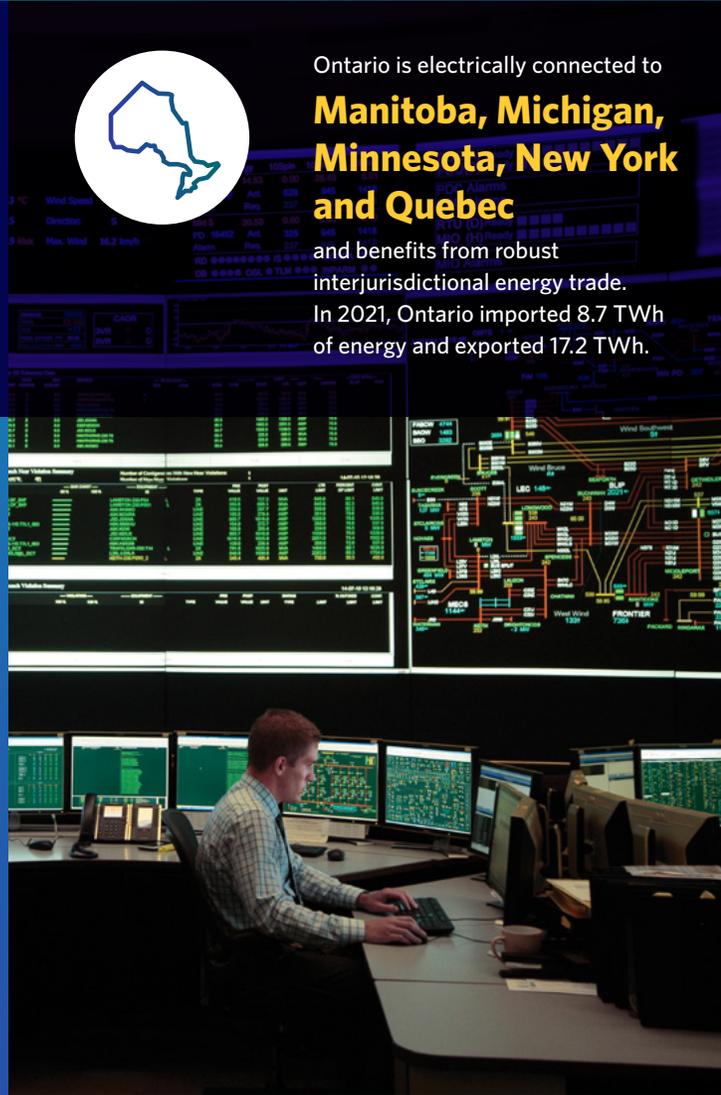
# 6.6 million EVs

in Ontario by 2042, with an annual charging demand of 24.4 TWh and a peak demand of 1,200 MW.



Ontario is electrically connected to  
**Manitoba, Michigan,  
 Minnesota, New York  
 and Quebec**

and benefits from robust  
 interjurisdictional energy trade.  
 In 2021, Ontario imported 8.7 TWh  
 of energy and exported 17.2 TWh.



North American grid, we have a shared responsibility to protect physical and cyber assets. The issue will become even more pressing in the years ahead, as many sectors look to reduce their carbon footprint through electrification, thereby increasing their reliance on the grid.

Ontario's electricity sector participants are all part of a single, integrated North American grid. Given the size and scope of the electricity supply chain, it is imperative that we identify any vulnerabilities and shore up our cyber defences.

By 2027, we will have refreshed our cyber security roadmap. This roadmap also includes enhanced cyber risk assessment protocols through which we continuously assess cyber security risk across our people, processes and technologies. By strengthening all the links in the chain, we can boost the resilience and reliability of the grid as a whole.

At the same time, we will also have moved the needle on a separate technology modernization strategy and roadmap. This initiative will introduce robust, modern and standardized technology platforms and capabilities to support and drive the IESO's business transformation. Through this work, we will future-proof our organizational technology capabilities and solutions, enhance their efficiency and scalability, and support faster project execution.

We cannot implement these changes without a future-focused and agile workforce. By the time this strategy is implemented, our efforts in the areas of learning and development will be paying off. We will have hired new employees and closed the emerging



Our electricity demand forecasts show steady average growth of about

**1.7 per cent a year.**

Key factors driving demand are emerging electrification initiatives and growth of the economy.

knowledge gaps so that our staff have the technical skills they need to thrive in this changing environment and deliver value to Ontario ratepayers.

By investing in our employees, we will build organizational capacity. And by fostering equity, diversity and inclusion, we will have created an environment where employees feel safe to challenge the status quo, present new ideas and propose better ways to deliver key projects and initiatives.

The coming years will pose many challenges, not just for the IESO but for the sector as a whole. We will strengthen our relationships with stakeholders and Indigenous communities to help us effectively respond to changes in customer choice and policy, acting as an advisor and participant in discussions on Ontario's energy future.

Implementation of this strategy will enable us to collectively plan and prepare for the changes we are experiencing today as well as the ones that lie ahead. Through these efforts, we will remain well positioned to drive and guide this transformation to support the long-term reliability, affordability and sustainability of Ontario's power system.

## Resources

This document sets out the IESO corporate strategy for 2022–2027. Additional information on planned initiatives and performance measures for the first three years will be available in our 2023–2025 business plan, to be submitted later this year.

- [Corporate website](#)
- [2021 Annual Report](#)
- [Annual Planning Outlook](#)
- [Annual Acquisition Report](#)
- [Grid Innovation Fund](#)
- [Indigenous Relations](#)
- [Indigenous Energy Support Programs](#)
- [Market Renewal Program](#)
- [Natural Gas Phase-out Study](#)
- [Powering Tomorrow](#)
- [Save on Energy](#)
- [Stakeholder Engagement](#)



## Independent Electricity System Operator

1600-120 Adelaide Street West  
Toronto, ON M5H 1T1

Phone: 905.403.6900

Toll-free: 1.888.448.7777

Email: [customer.relations@ieso.ca](mailto:customer.relations@ieso.ca)

 [@IESO\\_Tweets](https://twitter.com/IESO_Tweets)

 [linkedin.com/company/ieso](https://www.linkedin.com/company/ieso)

[ieso.ca](http://ieso.ca)

[saveonenergy.ca](http://saveonenergy.ca)

