
Business Plan 2023-2025

Independent Electricity System Operator
September 1, 2022



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Letter from the President & CEO

Ontario's electricity system is undergoing unprecedented transformation. Demand for electricity is forecast to grow substantially over the next two decades, driven by strong economic growth in the industrial, mining and agricultural sectors, as well as electrification of transportation. At the same time, supply conditions are tightening, with nuclear units being refurbished, the Pickering nuclear facility soon retiring, and generation contracts expiring.

Governments at all levels are moving forward with decarbonization policies, driven by community and customer preferences. While Ontario's electricity grid is well positioned to support decarbonization of the broader economy, being one of the cleanest in the world, we will need to be prepared for electrification to potentially double or triple demand over the next 20 years.

Like many jurisdictions around the world, new non-emitting resources are increasingly being integrated into the province's electricity grid. While energy storage and distributed energy resources are already playing a role in Ontario, the stage is set for these resources to take a big leap forward in the coming years.

With the increasing pace and scope of change, we felt it was time to refine and recalibrate our corporate strategy for the next five years to ensure we are well positioned to meet Ontarians' needs and expectations. For this reason, we undertook a thorough visioning process in late 2021 and early 2022 to imagine the sustainable future-state energy system that Ontario will require, and identify a series of concrete steps to deliver on future needs.

The 2023-2025 Business Plan sets out the IESO's revenue requirement and capital spending needed to maintain our critical responsibilities and deliver on our refreshed strategy.

As the system integrator, the IESO is being asked to do more with every passing year. The job of ensuring a reliable and affordable supply of electricity for Ontario's businesses, communities, residents and Indigenous peoples is becoming increasingly complex. Yet it remains crucial to power economic development and support decarbonization of the economy.

Despite the significant change underway, our electricity system is prepared for future growth, and the IESO is continuing to implement a comprehensive plan to procure new generation capacity. In parallel, we are also assessing the technical and human resource requirements to fully integrate these new resources and the energy they will eventually produce. At the same time, the IESO is actively studying how to reduce reliance on gas generation over the long term and transition to a more decarbonized electricity system.

The IESO is also continuing to integrate new non-emitting resources like energy storage and distributed energy resources, learning lessons that we can build on as we transition to a more sustainable electricity grid of the future. In addition, our energy efficiency programs continue to reduce grid demand while helping businesses save on costs, and we are looking at expanding opportunities.

Many of our initiatives are designed to drive down costs for Ontario ratepayers, and one of our integral initiatives to fulfil that goal is our Market Renewal Program (MRP). This project will bring

significant ratepayer benefits and ensure continued reliable operations as the system becomes more diversified, distributed and digitalized.

As we take proactive steps to ensure a reliable and affordable system, we must also remain vigilant to potential cybersecurity threats. Uptake of our cybersecurity services is increasing and cascading across the sector, helping to ensure local distribution companies and generation owners have access to the latest cyber intelligence. These efforts are critical as cyber threats have been identified as our primary risk.

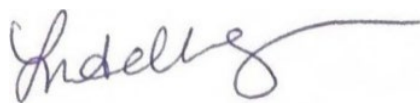
To support our efforts, we are enhancing our engagement efforts and strengthening our outreach to municipalities, Indigenous communities and electricity consumers.

While we continue to carefully review all expenditures and seek out new efficiencies, new investments are needed. To fully prepare the sector for the future and ensure Ontarians' electricity needs are met, we must invest in our people and our systems. As a result, the IESO is proposing increases to its budget to ensure we can continue to meet Ontarians' expectations of an affordable, sustainable, resilient and reliable power system.

To deliver on this plan, the IESO has a revenue requirement of \$208.4 million in 2023, \$218.4 million in 2024, and \$229.7 million in 2025. These figures represent increases of 5.8%, 4.8%, and 5.2% year over year. For the average residential electricity bill, this translates into an increase of 8.3 cents per month over the 2023-2025 planning period.

There are currently many exciting developments taking place across Ontario. The province is attracting new businesses, communities are developing ambitious energy plans, emerging technologies are providing more choice, and the transportation and industrial sectors are undergoing electrification.

The IESO is committed to supporting the future prosperity of the province by driving and guiding the sector's future, ensuring system reliability while supporting cost effectiveness, and driving business transformation. While this job is becoming increasingly challenging, with new investment we are confident that our comprehensive business plan and skilled workforce can continue to deliver.



Lesley Gallinger

President and CEO

2023-2025 Business Plan – IESO Priorities

Introduction

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 Independent Electricity System Operator (IESO) to ensure electricity is available where and when it’s needed.

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

Positioned at the heart of Ontario’s electricity sector, the IESO’s work impacts how electricity is produced and consumed, how it is transmitted and distributed, and how it is managed and planned for in real-time and over the longer term to ensure the province’s needs are met at all times.

We play a unique and critical role in Ontario’s energy ecosystem – and in the province as a whole. For more than a decade now, the electricity landscape has been experiencing an unprecedented transformation, and the pace of change shows no signs of slowing.

Facing these changes head-on, we are setting a course for a future state that is decarbonized, decentralized and digitalized. Although some aspects of this journey cannot be foreseen with certainty, the IESO is resolute in our commitment to support Ontario’s energy transition – leading change when required, but also facilitating our partners’ leadership.

In responding to sector transformation, the IESO refined and recalibrated its five-year corporate strategy in early 2022. This business plan is anchored in our refreshed strategy, and adds more specificity and detail to demonstrate how we plan to deliver value for Ontarians in the coming years.

IESO Corporate Strategy at a Glance



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 and effectively responding to changes in customer choice and policy, while acting as an advisor and participant in discussions on how to create a sustainable, future-state energy system.

Strengthen stakeholder and Indigenous community engagement via purposeful, transparent outreach

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 various levels 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.

To do so requires honest and open dialogue with the parties affected by our decisions. Given the scope and impact of our mandate, we must work closely with a large number of affected interests, often with competing priorities and varying perspectives. For this reason, engagement activities are absolutely essential to informing the IESO's work.

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 and collaborating with different groups through thoughtful means and mechanisms.

Our engagement with Indigenous communities and organizations, for example, 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 greater autonomy and becoming catalysts for change.

The IESO is proud to stand beside them on this journey to greater self-determination. While there is still work to be done, developing 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.

As our electricity system becomes more decentralized, with more choice at the consumer and community level, the IESO is also strengthening its engagement with municipalities. These efforts will ensure municipal input is integrated into IESO decision making, and that municipalities are aware of opportunities available to them to use electricity to achieve economic development and sustainability goals.

Given the scope and volume of new infrastructure that will be required to ensure the province's capacity needs are met, as are the energy needs that emerge later, the IESO will continue to work with transmitters, distributors, generators, consumers, municipalities and Indigenous communities to ensure all voices are heard and all perspectives are considered.

Identify, anticipate and respond to changes in customer choice and policy

Consumer preferences and choices are some of the key drivers behind the energy transition that is underway. As our reliance on electricity increases through economic growth and the transition to non-emitting energy sources, the IESO is supporting 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 charging solutions, strategic energy management and artificial intelligence, to name a few.

In the meantime, we are accelerating our efforts to integrate distributed energy resources into Ontario's electricity grid and market. These small-scale community-based resources 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 power 1.7 million homes for a 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.

Advise on and actively participate in dialogue on the configuration of the future-state sustainable energy system

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

We are actively working to integrate emerging technologies and enable new resources to participate in the IESO markets. 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 IESO's Enabling Resources initiative.

Through active engagement with stakeholders and communities, we have already made great strides, as we build a participation model for implementation. 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 sustainable options.

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.

While efforts to reduce emissions across all sectors continue to accelerate, the coming decade will see a rapidly-changing electricity landscape in Ontario. As the first jurisdiction in North America to completely eliminate coal-fired electricity generation, today, Ontario's electricity system is among the cleanest in the world, accounting for less than three per cent of the province's GHG emissions.

The IESO has been engaging with stakeholders, technical experts and others to develop a view of Ontario's decarbonized future. Our Pathways to Decarbonization project provides a focus for concrete conversations about how to eliminate greenhouse gas (GHG) emissions from our system while balancing the need to maintain reliability as other sectors of the economy also decarbonize through electrification.

The move towards greater decarbonization is driving Ontario residents, businesses, institutions and communities to seek new opportunities to further reduce GHG emissions. 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, smart thermostats 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-related objectives. At the same time, a number of municipalities across Ontario have established their own emission reduction targets. Many are implementing major energy-efficiency projects and testing electric transit systems as part of their own climate-change mitigation strategies.

The IESO will continue to share 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. Plotting a viable, sustainable and financially responsible course for Ontario's energy future is a shared responsibility. The IESO will remain steadfast in our efforts to bring the right parties together to explore options to meet changing needs and priorities.

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 cybersecurity.

Renew the real-time 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 Market Renewal Program (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 also accommodate a range of new resource types, often with different strengths 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. Market Renewal is building the foundation to enable our future needs, decarbonization goals, demand-side participation and new innovations entering the market.

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. We are securing resources, testing new integration models and re-examining our systems and processes to reduce barriers to entry to ensure 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. In addition to meeting the IESO's operational requirements, the system must satisfy the needs of ratepayers and communities, as well as asset owners and investors.

In lockstep with the planned implementation of MRP, we are also making great progress on a multi-year initiative to replace our legacy settlement systems to ensure they can support the complex needs of the project. Settling the market is a critical function that requires sophisticated software. Over \$22 billion in transactions occur each year through IESO's administered markets and programs so it is imperative that these transactions be settled accurately.

We will continue to take the necessary steps to ensure reliability by upgrading and replacing core applications, infrastructure and cybersecurity tools. For example, core projects include a refresh of the Transmission Rights Auction platform and the completion of the Supervisory Control and Data Acquisition (SCADA) / Energy Management System (EMS) upgrade. We are also investing in a Market Analysis and Simulation Toolset, a tool to monitor, correct, improve or alter market design or operations over the multiple timeframes once MRP goes live.

Adapt short- and long-term planning to meet evolving 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 realities.

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 three 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. To achieve these objectives, we will update our demand forecasting tools and our energy modelling system to ensure we have access to state-of-the-art technologies.

We are also taking steps to improve how we identify and assess distributed energy resources and other non-wires alternatives as 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.

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. Every region has its own specific needs and interests so providing opportunities to gain insight from stakeholders and communities is also of paramount importance to inform our decision-making. To ensure electricity infrastructure gets built in a timely manner, we need all of our partners to understand the big picture and the need to expand the system.

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.

To meet future system needs, the IESO will be recommending a relatively large number of transmission projects in the coming years. Transmission projects can take at least seven to 10 years to build, and 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 preparing to take action to ensure long-term reliability, if needed.

Cost-effectively acquire services to maintain reliability in the evolving sector

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

We remain committed to the using competitive mechanisms to meet Ontario’s resource adequacy needs and are working with stakeholders, communities and others to deliver on the Resource Adequacy Framework.

To facilitate competition and provide business planning certainty, our efforts have been structured around three timeframes: short, medium and long-term. In the short term, capacity auctions will be the primary mechanism to meet needs, while existing resources capable of expansions or upgrades are the focus of our medium-term procurements. For new projects with longer lead times, we will conduct longer term procurements to respect developers’ need for certainty and a reasonable return on their investments.

In addition to procuring more capacity from existing and new resources, the IESO is also actively exploring the requirements to fully integrate these assets into grid operations and leverage the critical services they can provide – including, most importantly, energy.

Champion cybersecurity, situational awareness and best practices within the sector

Protecting the IESO grid against threats and vulnerabilities remains a high priority, both in the physical and cyber realms. 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 weakest links.

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.

In 2019, the IESO became the first system operator in North America to be accountable for providing cybersecurity-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.

We will continue to expand the reach and effectiveness of our flagship Lighthouse program to ensure we enroll as many members as possible. A holistic view and understanding of market participants’ cybersecurity postures and program objectives is required to develop an informed and coordinated approach to cyber resilience for Ontario’s electricity sector.

As cybersecurity events, and ransomware attacks in particular, continue to increase across the sector, the IESO is also focused on bolstering its cyber incident response capability. These initiatives include developing cyber incident response playbooks and conducting regular tabletop exercises to practice response execution in an effort to reduce the potential impact and accelerate resolution timelines.

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.

Define and enhance our desired culture and employee experience

The IESO's organizational success is underpinned by our employees. For this reason, we are taking concrete steps to modernize our corporate culture and enhance the employee experience. The IESO is on a journey to establish a more inclusive culture where our people can realize their full potential.

Our vision is to create a sense of belonging, where diverse expertise and perspectives are valued. 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 it.

We have already taken a number of actions, with more to follow. The IESO is working to support its employees by promoting a clear understanding of our purpose, strategic priorities, and key activities. Leaders must create an environment of inclusivity, enhance their team's connection to support IESO's priorities and encourage diverse perspectives while investing in each other's success.

This evolution requires ongoing organizational focus and change in a number of areas. We must fully align our workforce to common goals and priorities. This shared understanding will help to build a united, cohesive team with a common commitment to achieving our goals.

We are also proceeding with an organizational alignment review that will be implemented in 2023. This review will ensure we have the right organizational structure in place to provide clarity for decision-making through well-defined leadership roles with clear accountabilities. This will support the delivery of our strategy and mandate moving forward.

The review will enable the IESO to identify existing strengths and opportunities for enhancements to our current organizational structure; align roles and accountabilities to the refreshed corporate strategy; clarify accountabilities and decision-making both vertically and horizontally; empower leaders within their scope of authority; and better enable our leaders to successfully guide their teams in implementing the strategic plan and delivering our core mandate.

Before the pandemic, we also launched a program to assess our broader space needs and explore the benefits offered by co-locating more employees at a single location. These benefits included advancing our culture, offering employees more flexibility and choice in how and where they work within the office, and optimizing our real estate footprint with savings realized outside of this business plan's time horizon. While the strategies to achieve our goals have evolved over time, many of our objectives remain the same: a more flexible, inviting and cost-effective workspace that responds to emerging workplace trends and employee feedback, supporting a culture based on teamwork and collaboration, and an improved employee experience overall.

Although the pandemic has provided an opportunity for us to reconsider and reevaluate our space needs, especially in the context of a proposed hybrid work model, we will continue to prioritize employee wellbeing, business productivity and cost containment.

Identify and build next-generation skills and competencies

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 lifecycle. 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 play a key role 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 aligning program offerings with corporate priorities and employee interests, which is essential to driving engagement, commitment and loyalty.

We are proactively working to build the necessary capabilities for the future to deliver on our mandate. For example, forecasting demand and ensuring resource availability is a complex task that requires expertise across the organization, including planning, operations, contract management, information technology and market development, among others.

We are also developing plans to attract, engage and retain top-level talent in certain key areas, including cybersecurity, data science, artificial intelligence and machine learning, stakeholder and community relations, contract management, and economics. 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 academic institutions to attract 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.

Evolve business processes, technologies and tools

Driving business transformation involves optimizing our workforce as well as the systems and processes that support them. As with every aspect of Ontario's electricity sector, the changes required to make this happen are significant and wide reaching. Today, we are making the necessary investments to facilitate this transformation and deliver long-term value to residents, communities, businesses and institutions across Ontario.

Complex information technology (IT) 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 in a risk-informed way, 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.

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.

Earlier this decade, the IESO embarked on a program of work 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 continue our work to leverage this data to identify additional market efficiencies, support reliable grid operations and improve our risk management practices.

We are also evolving and enhancing many of the IT systems that support our operations staff to ensure they have maximum visibility into different grid assets.

Financial Overview

The 2023-2025 Business Plan provides an overview of the resources required to maintain the high levels of performance necessary for the IESO to deliver on its core responsibilities, as well as deliver on the first three years of a refreshed strategy, committed to helping drive and guide a transition to ensure a reliable, affordable and sustainable energy future.

The IESO is moving forward on key initiatives that are critical to maintaining its core operations and to support the significant growth in the industrial, mining and agricultural sectors, as well as major expansion in transportation electrification, which will collectively drive higher electricity demand than Ontario has seen in many years; demand is expected to increase by nearly two per cent per year during the next 10 years. These demand increases are being compounded by nuclear retirements and refurbishments as well as the expiration of a large number of generator contracts, which impacts available supply. Energy needs are emerging as early as 2025.

To achieve this outcome, the IESO is proposing increases to its revenue requirement of 5.8%, 4.8%, and 5.2% over the three year planning period. The rapid increase in the interest rate is forecasted to add \$5.4 million of surplus through interest income to the IESO in 2022 by year-end. This rate of increase was not budgeted thus the surplus is deemed an uncontrollable variance that is excluded from the percentage year over year increase between 2022 and 2023 funding requirements. Over the 2023-2025 planning period, for the average residential electricity bill, this translates to an 8.3 cents per month increase. The IESO has taken steps to manage our exposure to macroeconomic trends and will continue to do so in support of value for ratepayers. The IESO has and will continue to carefully review all expenditures and find efficiencies, where possible, to minimize the impact to ratepayers of Ontario while we invest to support the significant transformation of the sector.

We have identified and leveraged efficiencies in several areas. As noted above, we anticipate a large increase in new generation and other contracts over the next three years and have overhauled some of our contract management and associated registration activities. By introducing contract procurement and registration fees that are paid by the project proponents, IESO expenses are offset and impacts to Ontario ratepayers are reduced. At the same time, further development of systems to track these contracts (Beacon system), automation of contract settlements and energy efficiency processes to streamline approvals have yielded operational efficiencies. Furthermore, we continue to realize efficiencies by examining our long-term office space needs.

In the 2023-2025 Business Plan, the IESO is proposing to:

- Continue work started in 2022 under Resource and Transmission Adequacy and Enabling Resources, furthering incremental investments to secure additional supply and expansions needed to address electricity needs emerging and the unprecedented transformation of the electricity system over the next decade.
- Deliver on government initiative work related to Class B and Interruptible rate pilots, potential program to provide new contracts for existing small hydroelectric generation facilities, enhanced energy efficiency conservation and demand management programs, along with other smaller initiatives.

- Complete the \$233 million Market Renewal Program (MRP) investment, at which time the new market will begin to generate significant ratepayer savings building on the benefits that the market has delivered to consumers over the past 20 years. The program investment will be amortized over a 20-year period. The new market will introduce new features and tools that require additional resources for market operations, monitoring and ongoing maintenance and support. As such, the business plan includes resources for additional staff, technical consultants and support & maintenance to operate the renewed market.
- Strengthen IESO's preparedness to support Ontario's electricity transformation through enhancing cybersecurity posture, reinforcing the resilience and integrity of the electricity grid, sustaining our critical IT systems and enabling the grid transformation program. It will also include strengthening stakeholder and community connections, and continuing to build out workforce capacity and capabilities to promote a high-performing organization.

These investments are necessary to enable the IESO to play a critical role in driving and guiding the energy transformation underway.

The 2022 forecast is below approved budget due to significantly higher interest income, increased electricity demand thus higher revenue and lower expenses driven by project and staff hiring delays. The 2023 higher expenses are driven by incremental initiatives and amortization impacts of assets placed into service in late 2022. In 2024 and 2025, expenses are impacted by transition to post MRP integration functions and services including amortization impacts, and further investments most notably in initiatives to ensure resource acquisition to meet system needs by 2026. The 2023-2025 business plan has significantly higher interest income and revenue from registration fees used to offset the revenue requirement.

After rigorous review, staffing levels will increase in 2023 as a number of strategic positions are added to support key initiatives (including the MRP). For 2023, the IESO anticipates an average of 914 full-time equivalent employees to deliver on core electricity system responsibilities and initiatives, as well as to support the MRP. Staffing levels will remain relatively flat in 2024 as the MRP begins to wind-down, with certain staff returning to core functions, concluding the transition in 2025 when the average full-time equivalent number of employees will be reduced to 900.

As part of its mandate, the IESO operates several programs that are funded from other sources and are not included in this business plan, including: the smart metering entity, market rule enforcement and education, and energy-efficiency programs.

The IESO has approval from the Ontario Energy Board to maintain an operating reserve of \$10 million to manage cost or revenue variances from budgets caused by changes to the external environment that impact the IESO and may not be within its control or reasonably foreseeable. This practice is adopted by similar sector organizations. As the IESO enters into its first three-year business plan, and given the complexity and uncertainty around the transformation of the sector, there is potential for additional unplanned needs that may be material in scope. The IESO will be recommending to the OEB an increase to the operating reserve to a balance of \$15 million, to be funded through its forecasted 2022 surplus, to address these potential needs.

Detailed Financials

The following table outlines 2023-2025 business plan operating revenues and expenses:

Pro Forma Statement of Operations
For the Year Ended December 31
(in Millions of Canadian Dollars)

(\$ Millions)	2022 Budget	2022 Forecast	2023 Budget	2024 Budget	2025 Budget
Revenue					
IESO Usage Fee	201.5	204.1	208.4	218.4	229.7
Expenses					
Baseline Expenses	172.8	171.4	175.4	181.4	187.7
Resource and Transmission Adequacy	1.7	1.4	6.0	8.8	7.3
Enabling Resources	0.4	0.6	0.8	0.9	0.9
Pathway to Decarbonization	1.3	0.9	-	-	-
Other Government Priorities	4.6	4.3	2.9	2.5	2.5
MRP – ongoing operation of new functions	0.5	0.2	1.9	3.0	4.2
Cybersecurity	-	0.9	1.6	1.6	2.1
Strengthening Engagement	-	-	0.7	1.1	1.6
Culture, Employees and Capabilities	-	-	0.8	0.8	1.0
Sustaining Technology, Evolving Processes and Tools	-	-	1.9	2.3	2.2
Operating Expenses sub-total	181.3	179.7	192.0	202.2	209.4
Amortization	20.0	18.5	23.1	22.0	27.0
Net Interest	(5.0)	(10.4)	(11.5)	(9.7)	(9.2)
Registration Fee	-	(0.8)	(0.5)	(0.5)	-
Market Renewal Program	5.2	4.3	5.3	4.4	2.5
Total Expenses	201.5	191.3	208.4	218.4	229.7
<i>Uncontrollable Interest Variance</i>		<i>5.4</i>			
<i>Adjusted Total Expenses</i>	<i>201.5</i>	<i>196.7</i>	<i>208.4</i>	<i>218.4</i>	<i>229.7</i>
<i>Year over year variance</i>		<i>-</i>	<i>5.8%</i>	<i>4.8%</i>	<i>5.2%</i>
Operating Surplus/(Deficit)	-	12.8	-	-	-
Accumulated Operating Surplus	8.7	15.0	15.0	15.0	15.0
Potential Rebate to Market Participants	-	6.5	-	-	-

Capital

As with previous years, the business planning process establishes an appropriate capital envelope for core operating initiatives over the business planning timeframe, with commitments approved individually, on an ongoing basis.

There will be increased capital investments over the period of the business plan in order to make significant investments in the IESO's facilities (\$30 million) and backup operating and data centres

(\$10.4 million) that are required to maintain our facilities, drive business transformation and maintain reliable system and business operations.

In addition to these major investments, a number of other capital projects will be undertaken to fulfill our mandate and advance our refreshed strategy. Details for the larger initiatives are outlined in Appendix 3.

The Market Renewal Program capital costs for 2023-2025 in the table below are the latest estimate of program spending and are in alignment with the revised schedule and in-service date approved by the IESO board.

Project details and associated descriptions are included in Appendix 3.

Capital (\$ Millions)	2022 Budget	2022 Forecast	2023 Budget	2024 Budget	2025 Budget
Core Operations Initiatives	30.0	30.0	23.0	28.6	30.6
Space Needs Program & Facility Investment	-	-	7.0	10.0	13.0
Back Up Operating and Data Centre Relocation	-	-	5.0	5.0	-
Market Renewal Program	41.2	37.1	51.0	32.3	14.6
Total Capital Envelope	71.2	67.1	86.0	75.9	58.2

Full Time Equivalent (FTE) Staffing

In 2023, the average core operations FTEs of 805 is higher than 2022 levels by 91 FTEs due to delayed hiring of resources in 2022 and additional resources to support the IESO's initiatives on-boarded throughout 2023. Core operations FTE levels in 2024 increase to 838, mainly due to ramp-up of staff required to support additional energy procurements and prepare for the new market functions/services. In 2025, as Market Renewal Program (MRP) is completed, some resources will be returning to core operations as others conclude their temporary employments, thus the increase to 856 FTEs.

Staffing levels required to support the MRP implementation will reach 109 FTE in 2023, and are expected to decrease slightly in 2024 as the project moves to operations testing activities. In 2025 some staff are retained to provide market participants and internal staff with training, complete internal documentation, make tool changes post go-live and ensure that a framework is in place to measure the benefits.

Average FTEs	2022 Budget	2022 Forecast	2023 Budget	2024 Budget	2025 Budget
Full Time Equivalents (FTEs)					
Core Operations	730	714	805	838	856
Market Renewal Program	97	92	109	88	44
Total FTEs	827	806	914	926	900

Market Renewal Financials

As of 2021, the Market Renewal Program (MRP) has entered the final phase of the initiative: implementation. This phase of work will ensure both the IESO and market participants are prepared for the launch of the renewed market.

Market Renewal Program Baseline Schedule, Budget Update and Funding

The IESO has been working with vendors and stakeholders to refine and translate the design into system requirements and rules needed to finalize the delivery schedule for MRP. In August 2022, the IESO Board approved revised program funding and a refreshed schedule, including an in-service date of May 2025. The updated cost estimate for the delivery of MRP is \$233 million, including contingency, and is outweighed by the significant ratepayer benefits from project implementation. A recent review of the MRP business case determined the renewed market will deliver substantial net financial benefits of over \$700 million to Ontario consumers over the first 10 years of operation.

The capital activities for MRP include solution development deliverables and testing, which requires contracting external vendors as well as broad support from across the organization, including a significant complement of IT resources. MRP activities funded through operating costs include the development of market rules and related stakeholder activities, change management planning and coordination, and updates to internal and external manuals.

In 2025, the IESO will require funding post go-live to deliver market participant support and training, complete internal document updates, and start project closure activities while maintaining a capital budget for additional vendor support and internal IT costs for tool changes identified after the in-service date.

The annual MRP project costs from 2023-2025 are consistent with the Board-approved refreshed schedule and funding.

Appendix 1 – IESO Performance Management – Measures and Targets

The IESO’s performance management program provides an important level of oversight for the organization and its stakeholders, and helps to ensure accountability and course correction, as needed.

Measures and targets have been revised to align with the IESO’s refreshed strategy and the 2023-2025 Business Plan. Since the strategy update this spring, Directors and ELT members have been engaged in an iterative process to contribute refreshed measures and identify annual targets. This set of measures is intended to help improve engagement and provide clear identification with how work efforts contribute to the IESO’s overall strategy success.

Strategic Alignment		Measure	Target			Measure Weight
			2023	2024	2025	
Outcomes	<ul style="list-style-type: none"> • Drive and guide the evolution of the system to ensure long-term reliability • Maintain affordability via competition and other mechanisms • Effectively respond to changes in policy and customer choices 	1. Market Renewal Program delivery: Total actual schedule complete percentage is within planned completion	80%	90%	100%	20%
		2. Maintaining Resource Adequacy: plans in place to ensure that resource adequacy reliability standards are met for the next 5 years	100%	100%	100%	10%
		3. Resource Adequacy procurement: number of supply offers in open and competitive mechanisms exceed the target capacity	20%	22%	24%	10%
		4. Enabling Resources Program delivery: Percentage complete according to program plan	33%	44%	65%	10%

Strategic Alignment		Measure	Target			Measure Weight
			2023	2024	2025	
Enablers	<ul style="list-style-type: none"> Evolve the IESO's culture enabled by people, tools, and processes to promote a high-performing organization Effectively tell the IESO's story to strengthen stakeholder and community connections 	5. Employee pulse survey results for specific annual engagement areas of focus	4% average increase	4% average increase	4% average increase	15%
		6. Effectiveness of stakeholder engagement actions through positive survey results (within -2% tolerance range)	80%	81%	82%	15%
Key Risk	<ul style="list-style-type: none"> Maintain vigilance on cyber security threats to the IESO and the system, and adapt as required 	7. Cyber threat intelligence technology implementation	90%	92%	94%	10%
		8. Phishing Metrics Trend	<5%	<4%	<3%	5%
		9. Determine pathway for assessment of appropriate regulatory instrument for system cyber risk mitigation*	Substantial Completion	TBD	TBD	5%

* 2023 is to develop a measure. Execution against cyber risk mitigation measure will occur in 2024-2025.

Appendix 2 – Enterprise Risk Management

At the IESO, risk management is an integrated discipline that supports informed decision-making throughout the organization. We recognize the pivotal role it plays in balancing strategic planning with business execution and compliance. This facilitates informed decision-making and a conscious evaluation of the upside opportunity and downside aspect of risk.

Our integrated approach to managing risk recognizes the need for clear, timely direction and support from our Board of Directors and senior, business unit and functional management.

Our starting point for managing risk is our strategic planning process, where key risks are identified from the internal and external threats and opportunities. Risks and opportunities are identified by observing, analyzing and anticipating trends along with macroeconomic, industry-specific, regional and local developments. Senior management assesses the risks to achieving our strategic objectives, and incorporates measures into corporate and operating plans to mitigate these risks if they exceed our target risk levels.

The IESO uses a risk management ranking methodology to assess the key risks specific to our achieving our strategic and business plan objectives. Our top strategic risks, aligned with the IESO’s strategic objectives and their associated residual risk assessment, are as follows:

Risk	Risk Assessment: Critical
	Mitigating Actions
<p>Material undersupply of energy at a provincial and regional level</p> <p>Medium-term timelines are becoming more critical within our strategic planning time horizon. As the province’s reliability coordinator, the IESO must comply with, oversee and enforce reliability standards and processes that are set by several regulatory bodies within and outside of Ontario. The concern about undersupply arises from not having sufficient time to address the long lead times needed to build infrastructure or the ability to respond to changes in demand.</p>	<ul style="list-style-type: none"> • Advancing initiatives under the Resource Adequacy framework to design and execute procurements to acquire committed and contracted resources • Expanding transmission planning programs to ensure new capacity can be connected • Enhancing planning and forecasting tools for medium- and long-term energy supply • Delivering annual acquisition report and annual planning outlook to provide stakeholders with much-needed insights into opportunities for existing and new resources • Building alignment with government on how potential barriers to procurements and challenges to new facility development will be overcome

Risk	Risk Assessment: Critical
	Mitigating Actions
<p>IESO actions to identify and address supply shortfalls not seen as credible by the stakeholder community</p> <p>The stakeholder community authorizes the IESO to take action and provide the resources necessary to create value towards the achievement of cost-effective reliability. Not having credibility with the stakeholder community can impede the IESO’s ability to deliver results.</p>	<ul style="list-style-type: none"> • Advancing initiatives under the Resource Adequacy Framework to design and execute procurements to acquire new supply • Consistently delivering on the Enabling Resources Program to introduce new grid-connected resources • Developing and executing a purposeful approach to stakeholder and community engagement • Enhancing external information sharing and reporting processes
Risk	Risk Assessment: High
	Mitigating Actions
<p>The IESO’s information technology systems and data are disrupted by cybersecurity threats</p> <p>Cyber attacks on the IESO’s information technology systems and data could be highly disruptive to reliability, business systems and data protection through exploiting vulnerabilities across people, processes, and technology. These threats from domestic and foreign threat actors may arise from malicious intent, financial motivation, ignorance and/or complacency. This risk needs to be monitored to protect the business, employees, and safeguard critical data, systems, and facilities from being compromised.</p>	<ul style="list-style-type: none"> • Promoting a culture of cybersecurity awareness through policies and training • Improving incident response capabilities and communications • Implementing targeted solutions to help better identify and mitigate malicious threat actors from launching a successful attack • Enhancing threat intelligence capabilities and upgrade network architecture, data management and security controls

Risk	Risk Assessment: High
	Mitigating Actions
<p>Cyberattack impacting non-IESO owned assets required for operating the IESO-controlled grid</p> <p>As cyberattacks targeting critical infrastructure are on the rise, a sector-wide, concerted cyber response is required from government, regulatory bodies, market participants and the IESO to augment response efforts. A holistic view and understanding of market participants' cybersecurity postures and program objectives is required to develop an informed and coordinated approach to cyber resiliency for the Ontario electricity sector.</p>	<ul style="list-style-type: none"> • Maintain robust reliability practices and contingency plans to respond to significant disruptions • Deliver Lighthouse services under OEB license to promote cyber information sharing and situational awareness across the sector • Conduct sector-wide threat assessments to identify vulnerabilities • Support external activities by developing playbooks and participating in broader groups and forums
Risk	Risk Assessment: High
	Mitigating Actions
<p>Competitive mechanisms not working as intended impairs the IESO's efficiency mandate</p> <p>The IESO is investing considerable time and resources to renew the wholesale electricity markets and operate the grid to drive reliability outcomes. The IESO's strategic priorities could be impacted if competition and supporting market mechanisms are impaired. If competition does not materialize as expected, the loss of stakeholder confidence could drive an emerging narrative that markets don't work thereby frustrating the IESO's efficiency mandate.</p>	<ul style="list-style-type: none"> • Design, development and testing of mechanisms as such as Market Power Mitigation under the Market Renewal Program • General Conduct Rule enforcement guidelines • Next phase of resource adequacy initiatives that involve competitive procurements and capacity auction as acquisition mechanisms

Risk	Risk Assessment: High
	Mitigating Actions
<p>Readiness of our culture, people, processes and tools to rapidly adapt and pivot to address transformation</p> <p>To deliver on the organization’s goals and meet the demands of sector transformation, the IESO will need to transform. Meeting the demands of transformation is a complex process involving alignment of leadership, practices and culture. Evolving the maturity of the IESO’s culture, people, processes and tools will require some necessary pre- and co-requisite change readiness supports.</p>	<ul style="list-style-type: none"> • Acquisition of business and grid control tools to support transformation • Resource planning and utilization: roles and accountabilities and workforce planning initiatives • Development of future capability: employee, leadership, technical, and business learning; succession planning • Culture transformation: Equity, diversity and inclusion (ED&I) Annual Plan and employee experience annual areas of focus • Evolve data and information governance practices

Appendix 3 – Capital Spending

Summary of 2023 - 2025 Capital Spending

Change Initiatives/Projects (\$ Millions)	2023 Budget	2024 Budget	2025 Budget
Replacement of the Settlement Systems	4.4	0.8	0.1
Data Excellence Program	0.5	0.8	0.5
Wide Area Visualization Environment (WAVE) - Phase 2	0.5	0.3	
Enabling Resources Program	0.3	0.6	3.3
Addressing Market Surveillance Panel (MSP) Recommendations	1.2	0.4	0.5
Dynamic Limits in Real-Time	2.8	0.2	
Enterprise Antivirus Replacement	0.3		
Resource Adequacy Program	1.0	1.2	1.3
Market Analysis and Simulation Toolset (MAST)	0.5	2.4	1.0
Long Term Demand Forecast Tool Replacement	1.0	0.8	
Core Network Refresh	2.0	0.6	
PMU Integration - Phase 3	1.0	1.0	1.0
Space Needs Program	7.0	10.0	13.0
Backup Operating and Data Centres Relocation Project	5.0	5.4	
Meter Data Management System Replacement (MDMS)	0.3	2.0	3.5
Enabling Grid Transformation Program	0.1	1.1	7.0
Lawson Refresh		0.2	1.9
Firewall Refresh	0.2	2.8	
Data Loss Prevention (DLP) Phase 2		1.5	1.0
Windows Infrastructure Refresh	1.9	0.1	
MIM Technical Refresh	1.1		
LogRhythm SIEM Refresh		2.9	0.1
Network WAN Infrastructure		1.6	0.1
Cybertec Refresh		0.9	0.1
Aspen File Server Refresh			2.1
Intrusion Prevention System (IPS) Refresh			1.4
Capital (1 million and above)	31.1	37.6	37.9
Other Initiatives/Projects (Less than a 1 million)	3.9	6.0	5.7
Total Without Market Renewal Program	35.0	43.6	43.6
Market Renewal Program	51.0	32.3	14.6
Total Including Market Renewal Program	86.0	75.9	58.2

2023-2025 Capital Plan Details

Project Name	Project Description
Replacement of the Settlement Systems	In replacing settlement systems that have been in operation since market opening in 2002, this project will address market re-design needs associated with implementation of the Market Renewal Program and enable systems to meet current and future business needs. In 2021, the IESO settled approximately \$22B in the IESO-Administered Markets, Ministry of Energy supported programs, and Global Adjustment through the settlement systems.
Data Excellence Program	To help harness the full value of IESO data, this program establishes an evolved data management and analytics framework to support the IESO’s complex business needs. Data governance policies and tools (data catalogue), an updated data warehouse strategy and supporting applications for high-value use cases and a centre of excellence for advanced machine learning applications are in the scope of the program roadmap.
Wide Area Visualization Environment (WAVE) - Phase 2	This project will improve situational awareness and maintain ongoing compliance with NERC IRO standards by expanding modelling to neighbouring power systems (NYISO, PJM and Hydro-Quebec), improving the IESO’s ability to monitor and respond to real-time conditions that may affect the IESO controlled grid.
Enabling Resources Program	Through the Program the IESO will prioritize and undertake the work to increase the number of resource types (e.g. hybrids, storage) that can participate in the IESO markets to deliver energy, capacity and ancillary services in order to increase options for reliability and competition to drive affordability.
Addressing Market Surveillance Panel (MSP) Recommendations	A portfolio of initiatives to develop, evolve and address inefficiencies in the electricity market in response to observations by the MSP and other stakeholders.
Dynamic Limits in Real-Time	In enabling the continuous assessment of real-time grid conditions, the Dynamic Limits in Real-Time (DLRT) Project will significantly improve the utilization of Ontario’s transmission system, resulting in market and system operations efficiencies, and increased system security and resilience.
Enterprise Antivirus Replacement	The current antivirus solution which was commissioned in 2018 has approached end of support by the vendor on the solution lifecycle. The current vendor is moving to a cloud based service offering only, which will not meet the current NERC Critical Infrastructure Protection (CIP) standards. This project will replace the current antivirus solution with a new on-premise solution that will maintain the IESO’s security posture and continue to meet the NERC CIP requirements.
Resource Adequacy Program	As part of its commitment to competitive mechanisms to meet Ontario’s resource adequacy needs, the IESO is working with stakeholders to implement the Resource Adequacy framework to develop and execute multiple mechanisms, such as the Capacity Auction and Requests for Proposals to acquire products and services needed to maintain reliability cost-effectively.
Market Analysis and Simulation Toolset (MAST)	As the Market Renewal Program (MRP) is introducing wholesale market changes, current tools to monitor, assess and analyze the new market will be insufficient. MAST will deploy a common assessment tool environment that can be utilized in multiple business processes that will monitor, correct, improve or alter market design or operations over the day-ahead, pre-dispatch and real-time periods. The new tools are required after MRP go-live.

Long Term Demand Forecast Tool Replacement	This project will replace the existing Long-Term Demand Forecast tools which have reached end of life and update the end-use load profiles used to develop the long-term forecasts. These tools are essential to support the planning processes that forecast system needs and provide infrastructure investment advice for the next 20 years.
Core Network Refresh	The IESO’s Core and Data Centre networks provide the backbone of the IESO’s network infrastructure, connecting all systems and locations in a robust and reliable high-performance network. The existing core and data centre infrastructure needs to be refreshed as it is approaching the end of manufacturer support.
PMU Integration - Phase 3	<p>Phasor Measurement Units (PMUs) can continuously deliver high-quality, time synchronized real-time power system data at a high frequency (30-60 samples per second). Obtaining PMU data from across Ontario will improve real-time monitoring of the IESO-controlled grid; obtaining PMU data from other jurisdictions will improve wide-area view; and both will improve the IESO’s overall situational awareness. PMUs also provide the IESO the ability to diagnose incidents and to more efficiently comply with several NERC reliability standards.</p> <p>Building on the earlier phases of this work, Phase 3 will integrate PMU data into the IESO's operations support tools and services, as well as live information into the Control Room.</p> <p>The Market Rules to support this change have been implemented and will become enforceable at the end of 2024 to give participants and the IESO sufficient time to implement these changes.</p>
Space Needs Program	IESO owns and leases three office facilities in the Greater Toronto Area. Our primary location in Mississauga, which the IESO owns and operates, was built in 1989 and requires significant investments in its electrical, mechanical and structural systems over the next 4-5 years. Building on the experience from an office pilot project being undertaken in 2022, the results will define the path forward with respect to the IESO’s overall office footprint and the modernization of the workspace. The modernization of the workspace will be critical to meet the needs of today’s workforce and supports the attraction and retention of IESO staff
Backup Operating and Data Centres Relocation Project	As part of its system operator mandate, the IESO operates a Backup Operating Centre (BOC) and Backup Data Centre (BDC) to ensure continuous operation of Ontario’s power system and IESO’s business operations in event of an emergency affecting the power system or IESO’s control centre. These facilities are also required in order to comply with North American Electric Reliability Corporation (NERC) reliability and critical infrastructure protection standards. The current BOC and BDC are reaching the end of their current lease terms and no longer meet the evolving needs of the IESO. This project will determine and secure a new location for these two critical facilities and make the necessary investments in order to meet both regulatory compliance and reliability needs.
Meter Data Management System Replacement (MDMS)	The current Meter Data Management solution that supports the IESO settlement processes is currently deployed on an application that cannot be upgraded. The business capabilities that the application supports will be delivered as part of an alternative solution through the Meter Data Management System Replacement project.

Enabling Grid Transformation Program	In conjunction with the PMU Phase 3, Wide Area Visualization - Phase 2 and Dynamic Limits In Real-Time projects, this program will implement new technologies, processes, and more dynamic tools to support the operation of the transforming grid with more diverse resource types and a more complex transmission system. This work is critical to support resource retirements/replacements, meet incremental system demand by adding supply resources to the system, as well as provide future options for de-carbonization.
Lawson Refresh	Lawson Financials, the current financial and accounting application that supports both the Market and Corporate accounts has been used at the IESO since 1998. The last Lawson refresh project was completed in 2020 and is approaching end of life. This project will refresh our current financial system to ensure that it continues to meet our future financial accounting needs with a vendor supported tool.
Firewall Refresh	The existing IESO firewalls which provide access control to critical parts of the network such as the DMZ and internal corporate network are nearing the end of vendor support and need to be upgraded. This project seeks to build on the strengths of the existing security architecture by upgrading the key security controls at the firewall perimeter of IESO's data network and allow the IESO to take advantage of features which are used to reduce the risk of evolving cyber attacks and ensure mitigation of security concerns related to the industry.
Data Loss Prevention (DLP) Phase 2	Data loss prevention (DLP) is an approach that seeks to improve information security and protect business information from data breaches. This project will implement a technological DLP solution that will provide features and benefits in a variety of situations, all of which will allow the IESO to better understand how high-value data is handled within the network and will automate the prevention of data sharing with unauthorized personnel.
Windows Infrastructure Refresh	The current version of Microsoft Windows Server operating system is nearing end-of-life at which time Microsoft no longer provides support for the product, including critical security patches. This project will move us to the latest supported version of the Windows operating system and refresh the underlying hardware.
MIM Technical Refresh	The Market Information Management (MIM) system is the IESO solution that receives Dispatch Information (bids/offers) from Market Participants and is the repository for the results of the Day Ahead Optimization System and Market Information System. This project will update the solution to use supported hardware and supported technology components.
LogRhythm SIEM Refresh	LogRhythm is IESO's Security Information and Event Monitoring (SIEM) solution which monitors security events by gathering log data across all IT connected systems. This project will refresh the LogRhythm solution to provide more computing capacity to accommodate the growth of IESO's IT systems.
Network WAN Infrastructure	The IESO Wide-Area Network (WAN) infrastructure is a collection of networks that communicate with one another between all IESO locations, and with Market Participants through a WAN provider. This project will replace all WAN infrastructure which is reaching end of life.
Cybertec Refresh	The IESO collects over 100,000 telemetry data points every two (2) seconds and pushes that data into IESO's Supervisory Control and Data Acquisition (SCADA) systems. The Cybertec gateways support this critical function. This project will refresh the existing Cybertec gateways that have reached the end of their useful life.

Aspen File Server Refresh	Aspen is IESO’s corporate fileserver which stores much of IESO’s business information. This project will replace the underlying hardware and software with new hardware and software and migrate data to the new platform.
Intrusion Prevention System (IPS) Refresh	The Intrusion Prevention System (IPS) prevents network security attacks such as brute force attacks, Denial of Service (DoS) attacks and vulnerability exploits. IPS continuously monitors network traffic to detect/prevent against known and unknown vulnerability. This project will refresh the current IPS as it reaches end of life.

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