ONTARIO ENERGY BOARD

Report to the Minister of Energy

Improving Distribution Sector Resilience, Responsiveness and Cost Efficiency

June 29, 2023

Ontario

Ontario Energy Board

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1 EXECUTIVE SUMMARY

Electricity distributors are essential players in Ontario's transition to a cleaner economy. They are vital contributors in the province's electrification strategy, and as Ontario's climate changes, they will have a critical role to play in ensuring that the electricity service provided to the province's 5.4 million customers is reliable, resilient and affordable.

In view of the climate-related challenges that are coming, the Minister's Letter of Direction asked the OEB for advice and proposals to improve distribution sector resilience, responsiveness and cost efficiency. The Letter makes specific reference to the pressing need for distributors to continue providing high levels of reliability and resilience to their customers, be responsive to changing consumer expectations and new government mandates, and to do it all at an affordable price.

Our response to the Minister's Letter gives priority to customers and the potential hardships they face when severe weather occurrences happen. Customers are at the heart of everything the Ontario Energy Board does as an energy regulator. As we state in our business plan, our purpose is to oversee the provincial energy markets, protect the interests of customers, and support the collective advancement of the people of Ontario. As we continue to evolve into a Top Quartile Regulator, we are particularly mindful of the importance of transparency, accountability and continuous improvement. The advice and proposals in this Report reflect these commitments.

When severe weather hits and electricity service is interrupted, customers' lives and businesses can be affected over an extended period of time. Uncertainty, inconvenience, loss of income, decreased productivity, and potentially worse, are some of the unfortunate impacts that can come from the most severe types of storms, to say nothing of the significant costs to repair damaged assets.

While distributors are on the front lines of response to get power restored as quickly and safely as possible, it is important to recognize that they very often act in tandem with other distributors, municipal services, and levels of government to get the restoration job done and keep customers informed. In other words, climate-related events are not a distributor-only problem. Because weather events are unpredictable, the OEB's view is that the best

defence is to learn from each one, build a regulatory framework that is fortified by lessons learned, industry-wide best practices and the development of performance standards over time, and respond in ways that put the well-being and expectations of customers first.

ADVICE FOR GOVERNMENT

The Minister's Letter states that the time to reconsider the structure and regulation of the distribution sector is now. Having reviewed work that is already underway internally at the OEB, considered the research provided in the 2023 London Economics International (LEI) Report, and kept in mind related work pertaining to the distribution sector in recent years, the OEB offers the following summary of its advice to government. There is an opportunity for the Ontario government to:

- Spearhead a multi-sector resilience approach, one that brings to the table distributors, the OEB, and ultimately other municipal services, sectors, and levels of government, in order to support more informed asset planning and enhance coordination among different kinds of infrastructure owners. This Report enables that approach by providing the rationale for such a strategy, as well as a definition for resilience. Importantly, it also outlines in detail how the OEB's regulatory tools and oversight can be leveraged to build greater resilience and efficiency into distributors' overall performance. Alignment and coordination will drive efficiencies that benefit customers.

- Engrain a resilience and efficiency mindset further into distributors' planning initiatives and drive greater capacity for resilience, responsiveness and cost efficiency. The OEB looks to government to support the specific resilience efforts of the energy sector because we believe that enhanced resilience in electricity delivery will help to increase confidence and commitment to the energy transition. Government endorsement of the definition of resilience as put forward in this Report will help to generate momentum for the work ahead. Making available a common set of climate and weather forecast inputs for planners to use in their analyses is a further measure of support.

- Establish resilience expectations for a broad array of public facilities such as hospitals, schools or seniors' centres, as well as for services

such as water and wastewater. Its public oversight and public infrastructure planning roles mean government is well positioned to identify what these electricity customers should prepare for in order to meet their own power needs during disruptions, and to consider whether these facilities could also serve as gathering centres during extended outages.

- Support the testing and demonstration of temporary power supply options at a defined scale, in order to better understand the options that exist for customers to meet their own needs during power outages. Funding for such an endeavour could come from the creation of a new resilience-related focus area within the Independent Electricity System Operator's Grid Innovation Fund.

Through these steps, the provincial government can help to ensure that, at a macro level, public sector action is coordinated and appropriately aligned with relevant emerging standards and protocols, to best benefit all Ontario residents and businesses in the face of a changing climate.

The OEB's detailed advice for government is discussed on page 31 (Cross-Sectoral Collaboration – Opportunities for Government).

In support of the above initiatives, the OEB has a significant and complementary role to play. Our proposals for driving resilience into key areas such as operations planning, system hardening, restoration performance and capacity building are summarized below.

THE OEB'S RESILIENCE PROPOSALS

The path forward to enhanced resilience and improved capacity begins with a first critical step. To start, Ontario distributors need a commonly held, sector-wide definition of resilience. In the LEI Report, this is defined as: ***The ability of the electricity distribution network to respond to high-impact, low-frequency (HILF) disruptions by adequately preparing for, withstanding, rapidly recovering from, and adapting to these events.***

The OEB supports this view. Distributors will need to adopt this definition and apply it to everything from business planning and investment decisions to customer communications and cross-sectoral collaboration. They will also need to broaden their understanding of resilience, seeing it as more than simply the measures they take to return to service after a disruption, but a reality that informs their planning, system development, and management of assets.

We view a resilience mindset as one that goes beyond today's reliability-focused activities and is:

- Proactive
- Data-driven
- Performance-based
- Outcome-oriented
- Adaptable
- Agile

Resilience Mindset

Resilience-related expectations should not replace current reliability requirements., Distributors should build on the discipline that already goes into maintaining system reliability and take a holistic approach to their adaptation to risks arising from extreme weather events.

In pursuing a resilience mindset, distributors are not starting from scratch. Ontario distributors already undertake a number of actions consistent with ensuring a level of resilience in their systems. They plan their systems to operate reliably and safely in a range of conditions. They have emergency response plans. They may share mutual aid protocols with other utilities. They are expected to approach vegetation management (a major cause of service disruption) in a proactive way.

But a larger measure of preparation and planning is called for. Climate change means that the likelihood and severity of extreme weather are growing. Some storms are expected to inflict considerably more damage to infrastructure, making resilience expectations warranted. The OEB's view is that a more robust and consistent approach, applied to all distributors, is required in order to better protect Ontario customers and electricity distribution infrastructure. While these new expectations will challenge some utilities more than others, applying a common framework across the province will help to ensure all Ontario customers see the benefits of increased focus on resilience measures, regardless of which distributor serves them.

If step one in the new order of things is to define resilience, and step two is to adopt a resilience mindset, then step three is to establish a regulatory framework to enable resilience practices that acknowledge the potential

severity of the coming climate challenges, despite the fact that their exact nature, timing and severity are unknown.

The OEB believes that the question of resilience can largely be addressed within the current provincial regulatory framework. We are confident that the kinds of tools we already use today can be successfully developed to help define expectations for distributors as they prepare for, and respond to, weather-induced resilience events (referred to in this Report as HILF events). This clear and consistent framework of resilience expectations will enhance regulatory certainty for distributors and enable necessary planning and investment to take place so that customers (residential or commercial, large or small) can continue to count on dependable power delivery service in Ontario.

PROPOSALS AT A GLANCE

Improving Resilience & Responsiveness

The OEB proposes that distributors be required to:

- Provide details of their resilience and recovery efforts today, such as restoration plans, mutual aid practices, storm preparedness and storm-related exercises, in order to enable best practices to be identified and disseminated
- Integrate resilience into their system planning
- Engage in regular data-driven empirical assessments of the vulnerabilities in their distribution system and operations in the event of severe weather
- Prioritize value for customers when investing in system enhancements for resilience purposes
- Measure and report on restoration of service following a HILF event
- Satisfy minimum targets for customer communication related to interruptions and restoration of service following a disruption as a result of a HILF event

- Establish a peer review committee to evaluate restoration activities and review their peers' storm responses after a HILF event, with a view to identifying areas of improvement and best practice

- Report to government, via the peer review committee, at a set frequency on the aggregate impacts of severe weather in a given period

Enabling Capacity Through Cost Efficiency

New demands on distributors, such as those resulting from the need to prepare their systems and operations for the consequences of climate change, will require additional organizational capacity and resources.

The OEB has identified the following opportunities for enabling this outcome:

- To promote greater sharing of services among distributors, the OEB proposes that the government consider amending the *Ontario Energy Board Act, 1998* (or the regulations under the Act) in a manner that provides greater clarity and support for the sharing of services between or among distributors.

- To further enhance distributors' interest in sharing services, the OEB will review whether the accounting and associated rate treatment of shared services should be adjusted. It will also develop guidance on fair approaches to cost and risk apportionment for shared service provision, in order to protect customers' interests, as well as evaluate prior guidance that relates to sharing among distributors.

- To encourage greater efficiency through consolidation, and as a tool for shareholder decision-making, the OEB could commission the preparation of a handbook, directed at utility shareholders, to address common concerns related to utility transactions.

- The OEB will engage in a scoping exercise with stakeholders at the outset of its planned review of its mergers, amalgamations, acquisitions and divestitures (MAADs) policies in order to establish a set of common expectations regarding the issues to be considered.

- To encourage more efficient distributor behaviour, the OEB will review the elements used in its incentive rate-setting mechanisms and examine distributors' spending patterns to identify where changes or incremental incentives are warranted.

- To further motivate distributors to deliver the outcomes that customers value, the OEB proposes to develop a performance incentive regime in concert with stakeholders, building on prior work.

2 INTRODUCTION

This Report recommends a wide variety of measures to build capacity, increase cost efficiency, and plan for high-impact/low-frequency (HILF) events in Ontario's electricity distribution sector – all with a view to meeting customers' expectations for reliable and affordable electricity service.

The key pillars of the OEB's proposed resilience framework are anchored in service reliability and the value customers place on it. The expectations embedded in the framework encompass operations and system planning, restoration, and customer communication, and are designed to enable improvement over time.

Ontario distributors already practise measures that enable them to plan for emergencies and contain the risks of service interruptions. They prepare storm recovery plans, identify critical loads whose restoration must take

priority, and conduct training to prepare for restoration activities. However, the main thrust of this Report is that, industry-wide, the effort needs to be more rigorous and consistent; and that distributors must not only take steps to anticipate, prepare for, and, where possible, avoid disruptions. They must also determine the steps necessary to measure their performance in support of continuous improvement. To that end, the OEB favours the development of performance metrics, established in consultation with distributors, consumers and their representatives, and the broader sector, as well as reporting requirements that anchor resilience planning and investment in robust data and shared best practices.

A common thread running throughout this Report is that resilience is more than a distribution system challenge. Energy system operators around the world are grappling with potential solutions, as are federal, provincial and municipal governments. Energy consumers, too, have expectations for what constitutes sufficiently resilient energy delivery service. The interconnectedness of the resilience issue implies that there are multiple strategies and multiple solutions to making Ontario's electricity system ready to withstand, respond and adapt to severe weather events. As noted, a cohesive and coordinated approach, with clearly defined outcomes, is critical, especially in the context of the energy transition. Knowing that electricity services will remain resilient even as the climate changes is key to enhancing consumer trust in commitments to the low carbon pathways that are essential for meeting net zero goals.

Rationale for a new resilience framework*

- On May 21, 2022, a derecho brought winds of 190 km/h to the Ottawa/Gatineau region, knocking over thousands of trees, and leaving 180,000 homes and other buildings served by Hydro Ottawa without power. Some of the outages lasted for days. During the first 24 hours, the volume of calls to 911 totaled 2,800, almost triple the usual volume.

- On September 21, 2018, six tornadoes touched down in and near the National Capital Region. The strongest was an EF-3 tornado (with estimated wind speeds up to 265 km/h), as well as an EF-2 tornado (up to 220 km/h), and four EF-1 tornadoes (between 138-177 km/h). Over 300,000 customers in Ottawa, Gatineau, and Eastern Ontario were without power. According to the Canadian Disaster Database,

the estimated total costs attributed to the event were approximately $334 million.

- In Canada, insured catastrophic losses have risen from around $456 million per year on average over the late 1900s and early 2000s to "routinely exceeding" $2 billion per year, according to the Insurance Bureau of Canada, most of which is due to water-related damage. In 2022, insured losses across the country related to severe weather totaled $3.1 billion.

- Recent data from the Insurance Bureau of Canada also show that in Ontario, insured losses related to severe weather climbed to $1.2 billion in 2022 from $400 million in 2021.

- Natural Resources Canada (NRCan) reported in August 2022 that "Canada's climate is warming at a rate about twice that of the global average. Ontario's mean annual temperature increased by 1.3 degrees Celsius between 1948 and 2016, with mean annual precipitation increasing by 9.7 per cent over the same period. Climate model projections indicate these changes will continue, highlighting that the risks currently presented by climate change will become even greater in the future."

- The Intergovernmental Panel on Climate Change (IPCC) suggests that the electricity sector is one of the sectors most at risk of disruption from climate change. The effects of climate change and extreme weather can have direct and indirect impacts on electricity infrastructure. Examples of direct impacts include ice accretion and lightning strikes on overhead conductors, wind damage, premature aging, and conductor sag and annealing. Indirect impacts include changes to vegetation management, ice road integrity, vector-borne disease, and supply chain issues, as well as precipitation overwhelming riverine and urban drainage systems, resulting in flooding and potentially straining submersible equipment. Changes to climate may affect natural systems that control snow cover, frost depth, permafrost, ice cover on waterways, and lake-effect snow, which may, in turn, affect the integrity of infrastructure.

*Excerpts from LEI Report

3 METHODOLOGY

The OEB takes this opportunity to thank all stakeholder representatives who provided input for this Report.

In developing our advice and proposals, we leveraged our internal resources as well as expert advice from an external consultant (London Economics International), combining this with input from OEB stakeholder groups. We also developed a stakeholder engagement process and circulated a targeted survey to distributors participating in the process, to receive their input on the specific topics of collaboration and consolidation.

Documents related to this stakeholder engagement can be found at the OEB's Engage with Us microsite.

Collaborating with Stakeholders:

October	Received Letter of Direction from Minister of Energy.
November	Developed project plan; initiated literature review.
December	Developed scope and timing of jurisdictional review; developed project outline.
January	Assigned LEI to review best practices in managing HILF events, in jurisdictions around the world.
March	Convened first stakeholder meeting (March 20) with 145 participants including 28 local distribution

companies (LDCs). Presented external consultant's report for stakeholder discussion.

Initiated a targeted survey for 29 LDCs to gain more specific input on key non-resilience issues regarding consolidation and shared services.

April

Aggregated survey results from LDCs to help shape preliminary advice and proposals.

Convened a second stakeholder meeting (April 25) to discuss capacity-enabling measures and resilience proposals.

May

Convened third stakeholder meeting (May 17), focusing on restoration performance.

June

Report writing and internal reviews.

Submitted final report to Minister of Energy.

4 IMPROVING RESILIENCE AND RESPONSIVENESS

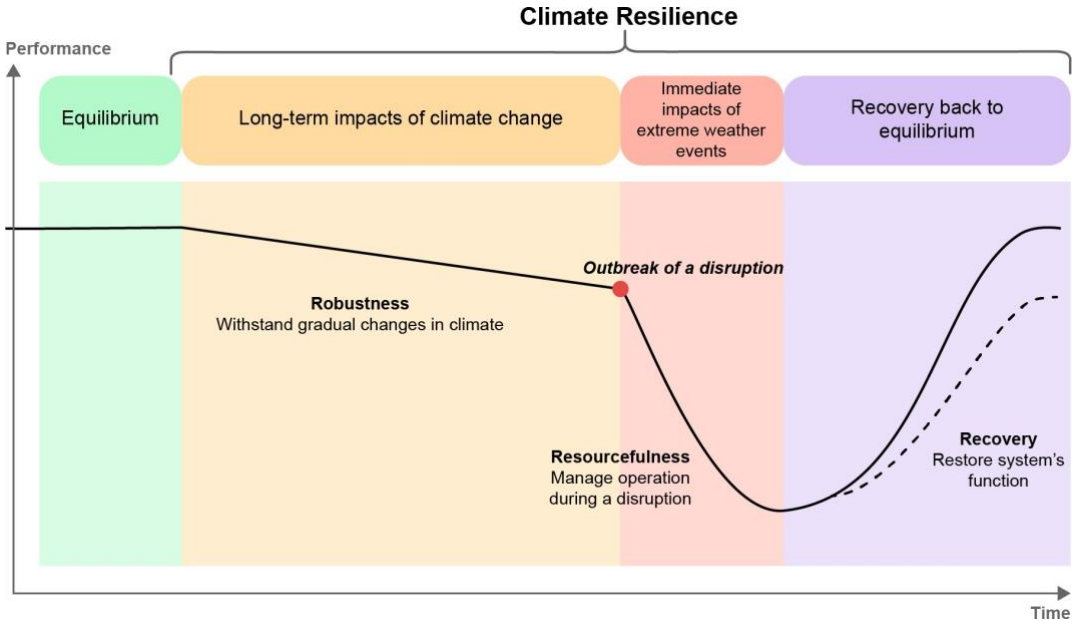
Electricity is inextricably linked to customers' comfort, safety and sense of security as well as to the province's economic growth and prosperity.

Enabling greater resilience and responsiveness in the face of HILF events is critical because it helps distributors to build trust with their customers, provides a coherent and integrated response to restoration that reflects value to customers, and ensures that the broader economic and societal risks associated with such events are minimized. The agility with which a utility responds to events, deals with emerging issues and threats, and demonstrates its ability to adapt to changing consumer and public policy expectations are all aspects of responsiveness that are discussed in this section.

What is resilience?

The OEB agrees with the definition for resilience that is used in the LEI Report: "***The ability of the electricity distribution network to respond to high-impact/low-frequency disruptions by adequately preparing for, withstanding, rapidly recovering from, and adapting to these events."***

Resilience refers to a spectrum that includes the electricity system's activities prior to and following a disruption. The chart shown below follows the path of a HILF event through the disruption phase, ending with recovery and restoration.



When HILF events occur, customers are affected in multiple ways including the time it takes for service to be restored, the costs associated with lost productivity and/or damaged assets, and the inconvenience they may experience until the system's full functionality returns.

Credit: *Climate Resilience for Energy Security Report*, International Energy Agency (April, 2021)

It is important to understand how the disruptions identified in the definition of resilience intersect with 'major events', a concept that utilities currently use to measure and define reliability.

The term 'major event' refers to an impact on the system that exceeds what equipment and operations are built to deal with on any given day, or in the face of a typical storm. A major event is characterized by a larger-than-usual impact on customers, a greater scale and duration of interruption, and a disruption to service that requires a response more intensive than is typical for wind, snow or thunderstorms. Major events are sometimes identified by a threshold level of interruption to customers, such as 10 per cent. Today, the OEB's preferred measure is to define major events quantitatively, with reference to the most recent five years of actual experience. Using this approach, major events are expected to happen two to three times per year.

The weather-induced disruptions mentioned in the definition of resilience are a subset of major events. They do not occur often; however, their impacts are distinctively high – higher than is typical of other major events. That is why we have elected to use the term high-impact, low-frequency (HILF) event throughout this Report.

Because the effects of HILF events can be widespread and costly, distributors need to consider ways to withstand and contain their impact, preparing their distribution systems and operations so as to reduce damage, and enable quick and effective recovery.

Resilience-related expectations should not replace current reliability requirements. Distributors should build on the discipline that already goes into maintaining system reliability and take a holistic approach to their adaptation to risks arising from extreme weather events.

To move from the conceptual stage of defining HILF events to the practicalities of implementing HILF-related actions and practices will require a number of steps. Distributors will need to develop greater understanding of the options available, evaluate those which are preferable given their circumstances, resources, and risks, and integrate them with existing approaches and plans. An essay prepared by the representatives of 17 regulatory bodies across the Midcontinent Independent System Operator (MISO) footprint provides a starting point, including a sampling of potential resilience measures, as shown in the chart here:

Examples of Electricity Distribution Resilience		
Event-agnostic physical improvements	**Physical improvements to address specific weather events**	**Event-agnostic policy/practice improvements**
• **Automated components** (smart meters, intelligent switching) to improve **problem detection** as well as **data collection** during an outage • **Protect key communication systems** used during a disaster • **Self-healing grid** components • **Microgrids** for critical facilities • **Replace aging infrastructure** • **Mobile substation equipment** • **DERs** to reduce load during a crisis • **Energy efficiency** to maintain livable conditions for longer periods • **Vegetation management**	• **Undergrounding** distribution lines • **Reinforce** poles • Install **guy wires** (i.e., tensioned cables to add stability to free-standing structures) • Install **hardened** pole-and-line designs and configurations • **Coat lines** to prevent ice buildup • **Elevate substations** • Use **advanced weather-prediction models**	• Develop **response protocols** • Develop **communications protocols** • Participate in **shared inventory/mutual assistance programs** • Develop business continuity and **emergency action plans** • Create **demand response programs** • **Regular testing** of backup generators • Utilize **drones** for damage inspections • **Regular security briefings** on emerging threats • Identify **critical infrastructure** and key resources

Source: Figure 9, LEI Report, p16.

OEB Proposal for a Resilience Framework

For the purposes of this Report, the OEB developed a preliminary resilience framework to help conceptualize its recommendations to the Minister. The framework outlines the expectations that need to be addressed in order for Ontario distributors to be considered 'resilient'.

The framework focuses on customers, who are at the heart of everything we do as a regulator. Electricity customers want energy security. They want value. They expect cost-effective and consistent service from a responsive, agile electricity delivery company. They accept that interruptions due to weather can occur. But when outages do happen, they want accurate information that can help them make the best choices for weathering the storm.

Electricity consumers value consistent service, and when outages do happen, they want accurate information that can help them make the best choices for weathering the storm.

The framework also focuses on ensuring consistency and uniformity among distributors, adopting data and quantitative approaches to ensure priorities are identified with appropriate rigour, and setting out measures that address each element of resilience (i.e., preparing for HILF events, assisting customers in withstanding the event, recovering safely and as rapidly as possible, and learning from past experience).

Overall, the OEB's framework is based on these guiding principles:

- Distributors' resilience-related operations and planning are transparent and consistent.
- System hardening to enhance resilience is based on an assessment of risk and value.
- Communication with customers during HILF events is accurate and adequate.
- Restoration performance is improved through reporting and assessment.
- Monitoring and peer review are used to identify gaps and encourage continuous improvement.

Operations Planning

Raising the profile of resilience-related activities will increase transparency and develop more consistency in these practices among distributors. Many of these tasks are already carried out today, as part of operations planning, but there is an opportunity to better organize them and give them more prominence as part of distributors' business activities.

To achieve this goal, the OEB proposes to require distributors to:

Provide details and report on their current storm recovery planning and preparation activities.

This includes data such as inventories of critical loads, details regarding restoration scenarios, storm-related exercises and description of mutual aid agreements, if any. It also calls for discussion of the broader context to demonstrate how their plans reflect and respond to experience. Additional information would include:

- Number and frequency of storm response deployments over the preceding period
- Explanation of how these deployments met or didn't meet the assumptions that formed the basis for distributors' plans
- Assessment of how plans and preparations need to change to reflect lived experience of the distributor, its staff, and its customers during the deployment
- Description of the inputs, contingency planning exercises or modeling used to develop and test the strength of their plans.

Currently, only some of this activity is regularly reported to the OEB or reviewed in the course of an application to establish a distributor's rates on the basis of the cost of providing service. The proposed framework provides a basis for bringing more information and knowledge about restoration practices to the fore.

It is important to note that how, and under what conditions, this information will be collected has yet to be determined, and will come into clearer focus as the resilience framework is developed and implemented. Generally speaking, if this information is used to substantiate associated spending on these efforts, it would be included as part of distributors' cost-based rate applications. Alternatively, if folded into reporting expectations (such as those which apply to major events), this information may be submitted after a triggering event.

The primary benefits of these new requirements include:

- Greater transparency into preparedness and the diversity of practices
- Increased awareness for the degree to which distributors are paying attention to resilience, and the strategies they have adopted for managing restoration efforts, prioritizing certain loads, and managing resources

- Clearer and more uniform regulatory expectations
- Identification of best practices.

More visibility into distributor practices can, in turn, support the development of more precise regulatory instruments, such as the development of a common methodology for determining the amount of expected recovery costs that should be provided for in rates on a forecast basis.

As part of this process, the OEB will need to consider the appropriate level of reporting by different distributors on the basis of their size. In general, the OEB's intent is to focus on the depth of resilience measures relative to the risks to be managed.

System Hardening

Another way that resilience can be improved is by making incremental investments in the distribution system itself – in other words, hardening the assets to withstand more severe conditions. While this is an important means of prevention of disruptions due to HILF events, it is vital that distributors do so in a way that ensures these investments are made on the basis of the value customers place on service, and in a way that complements existing planning drivers.

The first step is to require that distributors:

> Incorporate resilience into their system planning as an additional investment driver within their integrated system planning process.

In the same way as planners assess an asset's condition when considering asset renewal priorities, they also need to assess climate risks when analyzing a system for its exposure to disruption during a HILF event. Vulnerability assessments allow a distributor's exposure to specific climate-related risks to be gauged, given the equipment used, the terrain in which it operates, the geographic location where it operates, and the types of weather to which it may be exposed. This type of assessment is central to the resilience strategies found in jurisdictions such as California and New York

(see LEI Report) where catastrophic events prompted state governments to become more proactive about climate-related risk mitigation.

The OEB therefore proposes to require distributors to:

> Engage in a regular assessment of the vulnerabilities in their distribution system and operations in the event of severe weather.

Weather patterns are a critical aspect of vulnerability assessments. The OEB recommends distributors use the same data sources for weather information (specific or relevant to their service area and network characteristics). As discussed in the Cross-Sectoral Coordination section, we are of the view that the provincial government is well suited to ensuring that dependable, trusted and sufficiently granular information is available. As the LEI Report makes clear, common inputs will add clarity and consistency. They can also help to make the adjudication of applications that come before the OEB more straightforward, which ultimately delivers a more efficient result for customers across the sector. External inputs will also ensure that distributors use the most current data available, rather than relying on historical trends, which are not necessarily a sufficient predictor of the frequency and intensity of future HILF events.

Vulnerability assessments should be integrated into distributors' existing system planning and asset management practices. The benefit of integrating resilience opportunities into the overall planning framework is that the combination of resilience with existing planning drivers (such as asset renewal) could help distributors uncover new options for dealing with end-of-life asset replacement and new ways to add more value for customers.

The OEB also proposes that distributors:

> Prioritize value for customers when investing in system enhancements for resilience purposes.

The value of hardening options would be estimated as a function of the:

- probability of the event which gives rise to the investment need
- duration and scope of the impact on customers should the event occur
- value that affected customers, given their classes, place on electricity service.

This requirement will help to ensure that, as with all planning, distributors consider more than the technical merits of a given investment or modification to existing facilities. The cost of the investments (and the incremental value of the change) must also be closely evaluated in order to ensure service remains cost-effective and reflects customers' needs. In the context of resilience, customer benefit is gauged by the value they place on avoiding a service interruption (also known as the 'value of lost load', or VoLL).

"The value from a VoLL study is … in standardizing a framework for investment decisions. Not all resiliency investments are worthwhile, and regulators need to be cautious about being presented with ad hoc statements about the value of VoLL that may be inflated." (LEI, p.69)

VoLL allows quantification of the benefits that result from a lower number of interruptions, shorter duration of interruptions, or a smaller number of affected customers. The LEI Report suggests VoLL should be calculated for different customer classes, and should take into consideration different times of day and different seasons.

The LEI Report highlights how Germany, Norway and the United Kingdom use VoLL in their respective jurisdictions. The OEB also notes the approach taken by Ausgrid (Australia), where a climate impact assessment was used to calculate the dollar value of network interruptions due to extreme weather events using the 'Value of Customer Reliability', an input developed by the regulator.

The OEB recognizes that the value of adopting an investment assessment framework based on customers' VoLL is not in its precision (VoLL cannot be empirically measured; it must be estimated), so much as in the way it helps to standardize an approach to the evaluation of alternatives. The use of VoLL to guide planning also does not imply that investments are necessary, or even expected. Based on how customers value electricity service, not all kinds of vulnerabilities would be expected to be economic to avoid. The use of VoLL will simply help to ensure that opportunities are assessed with an appropriate level of consistency, detail and quantification.

While we acknowledge the challenges inherent in defining VoLL in a meaningful and consistent way, we remain of the view that a clear VoLL framework can ultimately enable more efficient decision-making. We will work with stakeholders to develop and implement an investment assessment approach incorporating VoLL. The additional rigour will ensure greater investment discipline and help to protect customers' interests with respect to the cost of service.

Restoration Performance

Assessing distributors' restoration performance will be an integral part of Ontario's resilience framework. When a HILF event happens, customers expect their electricity service to be restored in a timely manner. We believe that as electrification intensifies, customers' tolerance for, and ability to withstand longer outages will diminish. This makes restoration performance all the more critical.

Measurement will help to increase the alignment between customer expectations and utility capabilities, promote consistency in service levels across the province, allow successful approaches to be identified and replicated, and help substantiate improvements in response capability when performance lags.

This is why the OEB will work with the sector to enable distributors to:

Measure and report on restoration of service following a HILF event.

Restoration performance will be one of the more technically challenging aspects of the resilience framework. Its development will require input, and buy-in, from utility experts who are tasked with HILF event restoration, as well as from customers whose expectations will form the basis for the requirements ultimately put in place for distributors.

The OEB's ongoing Reliability and Power Quality Review (RPQR) initiative has been addressing major events reporting and measurement. We believe the RPQR working group (whose membership comprises utilities as well as customer groups both large and small) is the appropriate forum to engage

with industry participants for detailed exploration of restoration performance assessment methods and measures, as an extension of major event reporting.

In our recent engagements with stakeholders, the criteria for good restoration performance and potential measures were discussed at length. Stakeholders made it clear that the details of this issue will require more specialized discussion. The first task for the RPQR working group will be to determine and recommend to the OEB how HILF events should be further distinguished from other major events. The group can then determine and recommend to the OEB what metrics and related reporting would be effective for a HILF event, as distinct from a major event. Ultimately, the collection and review of reported measures (and other HILF event information) would serve as a reference for individual utility and sector improvement, as well as to enable benchmarking comparison of utilities and act as a reference point for customers' expectations.

The OEB expects that as the resilience framework matures and more HILF experience is reported, the potential for restoration performance standards following a HILF event, as a subset of reliability standards, will become apparent.

As this work progresses, a complementary measure to be considered will be the use of customer perspectives and priorities, which distributor stakeholders identified in our consultations as a crucial input for determining response capabilities. The OEB will consider the value of requiring surveys of customer satisfaction after restoration activities have been completed. In considering the benefits of this potential requirement, the OEB will remain mindful of the need to balance the associated costs with the value to be gained from capturing customer sentiment while the event is still top-of-mind.

Customer Communications

To provide communication that supports customers during outages, allowing them to make informed decisions about what to do during interruptions, the OEB proposes to require distributors to:

Satisfy minimum targets for customer communication regarding interruptions and restoration of service following a HILF event.

Communicating with customers during any type of service interruption is critical. It is paramount that customers be informed as quickly as possible that the utility is aware that an outage is affecting a given set of customers. Customers need to be given an estimate for how long it will take for power to be restored, so they can make informed decisions about what to do during the power restoration stage.

The OEB therefore proposes to work with the sector to develop standards for customer communication including: the time it takes distributors to inform their customers that an outage has taken place; the time to provide them with an estimated restoration time; and the frequency with which they should communicate with customers until power is actually restored. Included in the scope of this work should be consideration of the best channels to use to communicate with customers when outages happen.

The OEB also proposes that utilities be required to measure the accuracy of their outage identification messages and restoration estimates after a significant storm event, as well as the adequacy of the information provided, and that they undertake measures to improve customer supports based on results.

It is noteworthy that in a recent application following the 2022 derecho in Ontario (EB-2022-0317), three of the five activities which the distributor identified as areas for improvement related to customer information support and better messaging.

Further afield, the OEB also notes that in the aftermath of Storm Arwen that hit the U.K. in November, 2021, nearly one third of customers were given a restoration time that was not within 24 hours of their actual restoration time (and as many as 12 days later for some customers). The U.K.'s energy regulator (Ofgem) later conducted customer research and solicited stakeholder feedback which indicated that customers prefer knowing the worst-case scenario and being kept up-to-date with progress. In a report on the storm response, Ofgem recommended that "distributors develop their assumptions for estimating restoration times to improve their accuracy, so that customers can make informed choices about meeting their needs." The OEB's proposals are consistent with such an approach.

Continuous Improvement

In order to support continuous improvement, as well as identify and disseminate best practices, the OEB proposes that:

> Distributors establish a distributor peer review committee to evaluate restoration activities following a HILF event.

Distributors and their crews are first responders during service disruptions. While they often call upon each other for assistance during a storm event, after-the-fact, there is an opportunity to establish a regular practice of collaboration for assessing the efficacy, efficiency and responsiveness of their restoration work.

The Cornerstone Hydro Electric Concepts (CHEC) group reports that its member distributors already engage in this type of peer review. In the same way, the North American Electric Reliability Corporation (NERC) has implemented an event analysis program focusing on resilience, and developed a website with lessons learned on resilience-themed topics (i.e., anti-icing control strategies for turbines, cold weather operation of breakers, and dealing with high wind forecasts).

Ontario's distributors also use a peer-to-peer knowledge sharing approach to enhance cyber security readiness in Ontario's electricity sector. For example, through the Cyber Security Advisory Committee (CSAC), an industry-led committee consisting of representatives from Ontario's electricity utilities and other stakeholders, Ontario distributors collaborate and provide the OEB with expert advice to evolve Ontario's Cyber Security Framework.

The peer review recommendation is based on the notion that summaries of HILF events should be widely shared, lessons learned openly discussed, and opportunities for improvement implemented as appropriate.

The OEB also proposes a second responsibility for the peer review committee. In addition to reviewing utility responses to HILF events, the OEB proposes that:

Distributors report to the Minister of Energy, via the peer review committee, at a set frequency on the aggregate impacts of severe weather in a given period.

The report would include analysis and information such as:

- Number of HILF events
- Costs of recovery
- Total area affected
- Number of utilities affected
- Extent of damage
- Average time to restoration
- Total time to restoration
- Lessons learned
- Opportunities to improve response capacities.

Reporting directly will enable government to consider whether any policy measures should be enhanced through new tools. For example, if the government is undertaking a broader economic analysis of the impact that climate change events are having on the economy and provincial well-being, this type of reporting could help to determine whether certain types of businesses would benefit from additional supports to assist them in managing through interruptions. Equally, this type of data could inform discussions about whether tax-supported contributions should be made to complement ratepayer-funded investments in resilience. It could also identify weak spots where additional coordination and cooperation with provincial emergency management functions could reduce response times and get things back to normal more quickly. Information from the sector to government can help to ensure that policy deliberations are informed by timely, contextualized information.

5 CROSS-SECTORAL COORDINATION – OPPORTUNITIES FOR GOVERNMENT

As noted elsewhere in this Report, resilience is a cross-sectoral challenge that requires integrated thinking and solutions that are broader in scope than those typically applied to rate regulation of monopoly services. While rate-setting, licensing, compliance, data collecting, monitoring and performance incentives all have a role to play, regulatory instruments are just one part of a larger toolkit of resilience responses. Other tools and levers are better suited to government.

The first way the government can add value to the energy sector's resilience efforts is to:

> Endorse and champion the OEB's proposed definition of resilience as laid out in this Report.

This small signal can add momentum to the sector's efforts and help to move the process forward.

An equally strategic opportunity for government is to help to streamline the effort involved in forecasting and estimating the coming weather changes and to:

> Provide a common set of climate change inputs for planners to refer to, and apply, in their modelling.

As noted earlier in this Report, making available a trusted, common source of forecasting inputs (whether commissioned by government and supplied by an external expert group, or provided directly by an appropriate entity within the provincial government) will help to ensure that distributors' vulnerability assessments and resilience planning are conducted more consistently and uniformly. Not only will utility planners benefit from a durable, reliable and trusted data set, commonly and uniformly applied data will reduce utility, OEB staff and intervenor time in the review of applications, and help to focus

efforts on what to plan for, rather than judging whether the information used to prepare the plan is valid.

As part of a much broader resilience strategy, the government can help to:

Establish resilience expectations for public services such as hospitals, schools or seniors' centres, as well as for public services such as water supply.

The provincial government (with the input of local distributors where appropriate) is well-positioned to identify what these customers should prepare for in order to meet their power needs during HILF events, and which public facilities could potentially serve as shelter or a common resource point at those same times. The government could also request that an entity such as Emergency Management Ontario evaluate community needs and identify synergies between resilient public service facilities and public shelter requirements.

The government can also:

Support the testing and demonstration of temporary power supply options at a defined scale.

For example, by defining a new focus area for the Independent Electricity System Operator's (IESO) Grid Innovation Fund, the government could encourage the exploration of microgrid solutions designed to provide short-term self-supply options for customers that could safely 'island' during a power interruption and, for a certain period of time, meet some of their own needs in non-emitting ways. In addition, the province could help to identify financial or other supports for such programs that may be available through federal government programs.

The Ontario government could also take steps to ensure better coordination of asset and infrastructure resilience planning, with a view to anticipating, supporting and streamlining the resolution of issues that arise when multiple assets experience climate-related impacts at the same time. This would occur, for example, when emergency drainage is required around sewers near underground electrical vaults, when roads need to be cleared to help service remote infrastructure, or when telecommunications support is required for emergency response and public service communications.

The first step in this endeavour is to ensure that all planners of linear assets are using the same environmental and weather inputs for assessing their vulnerabilities. This would entail making climate change forecast inputs available not just to those who plan electricity distribution infrastructure, but also electricity transmitters, generators and those involved in building and maintaining sewers, water supply systems, roads and other public assets.

This type of activity may in turn call for provincial coordination with other line ministries, municipalities and their associations, as well as broader federal and national programs and strategies. To bring together these disparate groups and interests, the government could:

Spearhead the formation of a working group comprised of asset owners and planners, municipal and federal partners, industry associations and others to establish priorities and maintain a dialogue between all of those whose contributions are necessary in order to rise to the resilience challenge.

6 ENABLING CAPACITY THROUGH COST EFFICIENCY

Distributors are accustomed to managing and meeting new demands: They respond to their customers and connect new ones. They train, support and develop their staff. They plan long-lived assets and balance priorities for reinvestment, collectively deploying about $2 billion of new capital in a given year. Of late, they have been instrumental in preparing their systems to enable new pricing options and enhance customer support, including the recently introduced ultra-low overnight price plan and the adoption of the Green Button standard.

Like all organizations, Ontario distributors have their limits. Requiring distributors to prepare their systems and operations for the consequences of climate change will add to the demands they already face and will likely require additional organizational capacity and resources.

The Minister's Letter of Direction observes that additional capacity can be enabled through the pursuit of efficiencies within distributors' existing businesses, allowing the cost impact of satisfying new expectations to be offset, to some degree at least.

The Minister's Letter identifies the following ways in which LDCs can expand their capabilities: increased collaboration/shared services and consolidation (i.e., how utilities can join forces to provide services in lower-cost ways), and changes to the rate-setting framework and its incentive structure (i.e., how utilities are encouraged to find savings and increase performance in meeting their customers' needs and expectations). This section discusses options in each of these areas.

Collaboration and Shared Services

Fostering greater collaboration and enhancing the use of shared services (between and among distributors) is one way for a distributor to become more efficient and enable additional capacity. The OEB looked closely at how to make this approach to distribution service provision more straightforward.

Through reviews of utility applications, research, surveys and engagement with the sector, the OEB found that there is already substantial collaboration taking place today between distributors. Much of this effort takes place in the form of coordinated purchasing, working together on technical and

implementation matters (such as Green Button implementation), and, in more isolated cases, use of technical services made available by other distributors or their affiliates. However, from our review, we believe that distributors would appreciate more clarity about how the sharing of services should be structured; clarification could promote more sharing of services, especially day-to-day activities such as billing or frequently used resources such as customer information systems. Moreover, for some distributors, the statutory requirement to carry out business activities other than distribution through an affiliate may be an impediment to some shared services arrangements, since the costs or complexity of using an affiliate may diminish the value to be gained from offering a service to another distributor.

The OEB could provide interpretive guidance (such as a Staff Bulletin) on the options for distributors to share services with each other, but that may not overcome hesitation in the sector to explore new sharing opportunities. In our view, an amendment to the legislative framework is likely to be more effective in eliminating challenges to the sharing of services. Accordingly, the OEB identifies that:

> The government could consider whether to amend the *Ontario Energy Board Act, 1998* (or the regulations under the Act) in a manner that provides greater clarity and support for the sharing of services between distributors.

There are various ways such an amendment could be structured. One way might be to create a new exemption under the *Ontario Energy Board Act, 1998* (or potentially the regulations under that Act) allowing distributors to provide shared services to each other as a permissible non-distribution activity. This would relieve the distributor that provides the service from the requirement either to do so through an affiliate or to apply for an exemption from the OEB;[1] it would also eliminate any doubt about whether the distributor is allowed to provide the service in another distributor's licensed service area.

As a complement, the OEB could support greater sharing of services with further clarification, specifically:

[1] Under section 71 of the Act, a distributor is prohibited from carrying out a non-distribution activity except through an affiliate, subject to certain enumerated exceptions or an OEB order.

The OEB will review whether the accounting and associated rate treatment of shared services should be adjusted. It will also develop guidance on a fair approach to cost and risk apportionment for shared service provision, in order to protect customers' interests, as well as evaluate prior guidance that relates to sharing among distributors.

The OEB will review the way in which shared services are treated from a rates and accounting perspective. In addition, the OEB will consider any other related regulatory issues. If, under the current rate-setting framework, a service involves the investment of capital that can earn a return, some utilities may choose to provide the service themselves rather than buy it from another party because the latter would mean forgoing the opportunity to earn additional income. The OEB could consider whether the accounting and rate treatment of shared services, or other issues, should be adjusted so that it can be better aligned with earnings opportunities associated with in-house provision of the same service.

Further work would focus on the development of guidance on the fair apportionment of costs and risks between distributors and their customers. This would help to ensure there is no cross-subsidization between a utility's customer and other utilities or affiliated service providers, with a view to ensuring that customers are protected, and benefit, from sharing activities that their service providers engage in.

Consolidation

The Minister's Letter of Direction specifically asked us to explore consolidation as a source of efficiency gains.

As the OEB notes in its Handbook on Electricity Distributor and Transmitter Consolidations, the acquisition or merger of utilities can increase efficiency through the creation of economies of scale and contiguity. By permitting a larger scale of operation, customers can be served at a lower cost per customer, particularly as the responsibilities of utilities increase and become more complex. Consolidations that eliminate geographical boundaries between distribution areas can result in a more efficient distribution system; having fewer distributors could also simplify some aspects of electricity market operations and settlement. It is possible that some of the challenges that come with increased electrification, new technology, the pursuit of innovation, and climate change pressures can be addressed more efficiently where consolidation has already occurred.

Distributors hold some strong views on consolidation. Some stakeholders who participated in our engagement process said they are not convinced that the purported benefits of consolidation will materialize, especially in the context of a sale to a larger entity. Others indicated that bigger utilities can do more things (and do them differently) than small utilities. This might mean they have more to offer customers than smaller utilities do, or can more effectively manage some kinds of risks in ways that are beneficial for customers. Some participants noted that at times these differences in distributor capability are not considered when discussing the value of consolidation, and that when this happens, it can discourage interest in further consolidation.

In the OEB's view, there is an opportunity to provide the sector with more information about consolidation in order to help to address uncertainties, support more informed decision-making and promote consolidation among willing parties.

One opportunity is the following:

To encourage greater efficiency through consolidation and as a tool for shareholder decision-making, the OEB could commission the preparation of a handbook, directed at utility shareholders, to address common concerns related to utility transactions.

A handbook would help to address some recurring issues that may hinder consolidation activity. During the consultation, we heard that when the sale or merger of a small municipally held utility is being considered, local priorities often rise to the top of the agenda. For example, one utility reported that its discussions about a potential merger halted once it became clear that a local office would close. Another reported that concerns over potential political repercussions prevent a more open discussion of options such as consolidation.

If the shareholders of smaller utilities had a set of references, case studies or tools which identified different options for resolving key issues, or which illustrated how other parties have overcome key issues in the past, as well as the means to assess and value consolidation options, the process might be less fraught.

While a shareholder handbook could address certain kinds of issues specific to shareholder interests, additional work with the broader stakeholder community can also provide benefits.

That is why OEB intends to:

Engage stakeholders in a scoping exercise at the outset of its planned review of Mergers, Acquisitions, Amalgamations and Divestiture (MAADs)-related policies.

Survey responses and stakeholder input received as part of our work on this Report show broad and divergent views on consolidation. Some respondents suggested changes are needed to existing MAADs policies (such as the deferred rebasing policy that applies to electric utility consolidations). Others identified concerns such as uncertainty in transaction or related costs as barriers to consolidation activity, and proposed that an OEB policy be developed to allow these types of costs to be recovered through rates. This mixed input clearly suggests that more can be done to delineate the issues that OEB's policies are designed to address, as contrasted with those which parties must manage in other ways. It is for this reason that we see the value of a robust scoping exercise at the outset of the planned MAADs policy review.

An additional way for the OEB to stimulate support for consolidation deliberations has already been committed to: Earlier this year, the OEB indicated in its response to a report by the Office of the Auditor General of Ontario that it would establish a minimum standard for reporting requirements during deferred rebasing periods.

More information about the achieved savings of consolidated utilities will help to provide all interested parties with better information about the magnitude of savings that can be realized through consolidation and the confidence with which it can be predicted.

Once implemented, stakeholders will be able to review reporting from consolidated entities and conduct their own analysis. Over the longer term, the OEB could explore the extent to which improved performance, including in areas such as resilience, comprises part of the value proposition of utility consolidation.

Rate-Setting Adjustments

The OEB's rate-setting framework contains various elements, each of which contributes to a set of incentives for distributors to pace and prioritize their spending, increase productivity, manage risk, and seek out efficiencies in

their businesses. By using incentives, the OEB can motivate and support utilities in their drive to improve and innovate while avoiding the inefficiencies (and other issues) that can come from mandating a given technology or approach to service provision.

Regular review of rate-regulated entities' actual spending, income and other indicators helps to ensure that the regulator's incentives are functioning as designed, and that distributors' revenues remain a reasonable reflection of their costs. During the consultation, the OEB shared analysis with stakeholders regarding a preliminary review of distributor spending patterns (on operations, maintenance and administration). The analysis was prepared in order to inform discussion as to whether the number of years remaining in a five-year rate term (the standard under the current framework) affects the level and pace of spending in a given year.

A central thread of the feedback we heard was that in order to draw conclusions about the influence of the rate term, or other factors, on productivity, distributors' operational expenditures ought not be looked at in isolation. We heard that the OEB should consider and evaluate any patterns in capital spending at the same time. Accordingly, the OEB intends to:

Review the elements used in its incentive rate-setting mechanisms and examine distributors' spending patterns to identify where changes or incremental incentives are warranted.

This will involve expanding analysis beyond the interplay of operational expenditures and net income that was developed for this consultation; a more comprehensive evaluation of distributor spending patterns for both operating and capital costs will be undertaken instead. Once this analysis is complete, the OEB can consider whether any incentives could be developed or augmented so as to increase distributors' pursuit of efficiencies over the course of their entire rate term.

This work will become part of a broader planned initiative to review the elements that together comprise the incentive rate-setting mechanisms under the Renewed Regulatory Framework for Electricity. This includes, but is not limited to, the review of productivity and stretch factors employed in adjusting rates in years two through five of a utility's rate plan.

The OEB expects this work will:

- Fortify incentives for the pursuit of efficiencies
- Support more investigation into alternative methods for delivering service
- Prompt utilities to consider the use of enhanced shared services which take advantage of economies of scale
- Motivate utility managers to search for lower cost approaches through new or more effective use of technology.

Performance Incentives

Because of their focus on results and outcomes, performance incentive mechanisms provide a strong opportunity to enhance distributors' organizational capacity over the long term.

In our current framework, a relatively small percentage of distributors' revenues is determined as a function of their measured performance (within a range of 0.6 per cent of expected annual revenues, implemented through the stretch factor adjustment to a distributor's rates under incentive rate-setting options such as the Price Cap).

We have made considerable gains in some areas that would justify taking steps to increase the proportion of a distributor's revenues that are contingent on its performance, beyond the amount set out in the stretch factor. Work on activity- and program-based benchmarking, which looks at the costs of discrete work items (such as installing a distribution pole, or managing vegetation) is helping to standardize the measurement and reporting of the costs of particular activities. The RPQR initiative has also helped to improve the consistency and use of reliability data reporting by electricity distributors.

We believe there is an opportunity to go further, with a durable framework for performance incentives that comprises a larger share of revenue for distributors. Through the design of complementary incentive mechanisms, the OEB can enable a transition from reputational incentives (i.e., the distributor scorecard) toward the greater use of financial incentives that result in increments (or decrements) to a distributor's revenues based on results. However, in pondering this transition, there are important caveats. Good incentives crucially depend on good data. Setting and calibrating incentives can be challenging, and require considerable deliberation and consultation. Also required is a firm understanding of how performance-based incentives interact or overlap with other elements of rate-setting, such as the cost of

capital and the fact that earning is based on the value of capital investments in-service.

The design of incentives themselves is crucial. How quickly the value of an incentive increases or decreases (based on results achieved) can alter its power, and can sometimes lead to unintended consequences. Other considerations include: how much more revenue overall should be at risk as a result of outcomes achieved; the type of data required; and the development of reporting and measurement processes that underpin and generate confidence in the overall performance framework. Consideration must also be given to the areas of the distribution business that are suitable for measurement, beyond unit costs and reliability. Areas such as customer service, resilience, or managing peak loads on the system in ways that defer distribution system needs could all be worthwhile domains for performance incentives.

In light of these considerations, the OEB proposes to:

Develop a performance incentives regime that considers each of these aspects, and work with the sector to develop principles, generic designs, and other criteria for performance incentives.

This project will take time to carry out, but the anticipated result is that utilities will have stronger incentives to deliver the outcomes that customers value.

7 CONCLUSION

This Report provides the starting point for an industry-wide conversation about preparing Ontario's energy sector for the climate-related challenges ahead and paving the way for Ontario's energy transition. It offers advice and recommendations for government in this regard, and outlines the OEB's role in supporting the government's vision for greater distributor resiliency, responsiveness and cost efficiency.

In forming our response to the Minister's Letter of Direction, energy customers were the key priority. Protecting customers' interests, addressing their concerns, answering their questions, delivering value for money, among other things, are all part of the OEB's mandate, and it was therefore appropriate for us to consider the Minister's request from this vantage point. Our deliberations were also guided by our core values as an independent energy regulator, and those of other top quartile regulators, which include: independence, accountability, certainty, effectiveness, efficiency, and innovation.

This Report puts forth a definition for resilience, a strong rationale for adopting a resilience mindset and a regulatory framework to encourage greater distributor resilience. As a package, these steps will help to build clarity and contribute a measure of certainty for the sector's response to the approaching challenges of climate change.

Our proposals reflect our belief that a consistent set of expectations for distributors' approaches to preparedness, restoration and customer communication are key during severe weather events, and that effective regulatory oversight informed by strong data and measurable performance can ensure good outcomes for customers and for the electricity system. As work moves toward implementation, we will continue to take steps to ensure any incremental reporting or filing obligations are necessary, efficient, and focused on the objective of delivering value for customers.

We recognize that the steps required to meet new resilience expectations discussed in this Report may open the door to new costs for distributors. This is why we believe there are ongoing opportunities for distributors to look for operational efficiencies, leverage new technologies, adopt innovative approaches, undertake greater levels of shared services, and pursue consolidation to free up capacity and drive change. As a whole, all of these

measures lay the foundation for economic growth and prosperity for Ontario customers and their communities.

While the OEB believes that its regulatory tools and oversight can be leveraged to deliver more resilient distribution service for customers, we are also of the view that resilience is not a distributor-only issue. Resilience cuts across different sectors. It affects geographies, customers, and distribution assets differently. It is also strategically important: Resilience will enhance Ontario's clean energy advantage, and augment our safe, secure, reliable and low-emission supply.

The centrality of resilience within our work as Ontario's energy regulator is one of the main reasons why we see a significant role for government, as both a champion of cross-sectoral collaboration and an advocate for industry-wide sharing of climate- and resilience-related information. The entire energy sector, not just distributors, is in the transition to net zero together. This collaborative approach is modeled by other jurisdictions that were evaluated in the LEI Report, and the OEB fully supports further discussion of the specific opportunities that exist for Ontario.

DISCLAIMER

This report contains advice to inform the development of energy policy by the Ministry of Energy. It is not intended as guidance for the independent adjudication of applications by panels of OEB Commissioners, nor is it binding on them.

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