Distribution System Plan

2026-2030

Hydro Ottawa

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			2	Customer
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			2	Current Issues
		4		**Program Benefits**
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		3		**Program Drivers and Need**
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			2	Current Issues
		4		**Program Benefits**
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		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
			1	Reliability and Aging Infrastructure
			2	Resilience and Climate Change Adaptation
			3	Customer Experience
			4	Grid Modernization and DERs
			5	Workforce Planning and Renewal
			6	Productivity and Innovation
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
			3	Other Factors
	3	Customer Engagement Platforms		
		1		**Program Summary**
		2		**Performance Objectives and Targets**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	3	Customer Engagement Platforms (cont'd)		
		4		**Program Benefits**
			1	Reliability and Aging Infrastructure
			2	Customer
			3	Grid Modernization and DERs
			4	Productivity and Innovation
			5	Digitization and Technology Evolution
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
	4	Enterprise Solutions		
		1		**Program Summary**
		2		**Performance Objectives and Targets**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
			1	Reliability and Aging Infrastructure
			2	Customer
			3	Digitization and Technology Evolution
			4	Workforce Planning and Renewal
			5	Productivity and Innovation
		5		**Program Costs**
			1	Cost Factors

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	4	Enterprise Solutions (cont'd)		
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Project Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
	5	Data and System Integrations		
		1		**Program Summary**
		2		**Performance Objectives and Targets**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
			1	Reliability and Aging Infrastructure
			2	Resilience and Climate Change Adaptation
			3	Customer
			4	Cost Control and Rate Mitigation
			5	Digitization and Technology Evolution
			6	Productivity and Innovation
			7	Energy Transition and Electrification
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	5	Data and System Integrations (cont'd)		
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
			3	Other Factors
	6	Grid Technology		
		1		**Program Summary**
		2		**Performance Objectives and Targets**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
			1	Improved Distribution Model Accuracy
			2	System Operation Efficiency and Cost Effectiveness
			3	Reliable Solutions to Power Advanced Applications
			4	Cyber Security
			5	Economic Development
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Project Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	7	Connection to Cost Recovery Agreement		
		1		**Program Summary**
		2		**Performance Outcomes**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
			1	Operation Efficiency and Cost Effectiveness
			2	Customer
			3	Safety
			4	Coordination and Interoperability
			5	Economic Development
			6	Environment
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Preferred Alternative
		7		**Project Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
		8		**Leave-To-Construct (If Applicable)**
	8	Infrastructure and Cyber Security		
		1		**Program Summary**
		2		**Performance Objectives and Targets**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	8	Infrastructure and Cyber Security (cont'd)		
		4		**Program Benefits**
			1	Reliability and Aging Infrastructure
			2	Cyber Security
			3	Regulatory Compliance
			4	Grid Modernization
			5	Productivity and Innovation
			6	Digitization and Technology Evolution
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Program Execution and Risk Mitigations**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
	9	Tools Replacement		
		1		**Program Summary**
		2		**Performance Outcomes**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	9	Tools Replacement (cont'd)		
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
	10	Buildings - Facilities		
		1		**Program Summary**
		2		**Performance Outcomes**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
		5		**Program Costs**
			1	Cost Factors
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies
	11	Fleet Replacement		
		1		**Program Summary**
		2		**Performance Outcomes**
		3		**Program Drivers and Need**
			1	Main and Secondary Drivers
			2	Current Issues
		4		**Program Benefits**
		5		**Program Costs**
			1	Cost Factors

Schedule	Section	Sub-Section	Sub-Section (2)	Contents
2-5-9	General Plant Investments			
	11	Fleet Replacement (cont'd)		
		6		**Alternatives Evaluation**
			1	Alternatives Considered
			2	Evaluation Criteria
			3	Preferred Alternative
		7		**Program Execution and Risk Mitigation**
			1	Implementation Plan
			2	Risks to Completion and Risk Mitigation Strategies

1

DISTRIBUTION SYSTEM PLAN OVERVIEW

1. INTRODUCTION

Hydro Ottawa's Distribution System Plan (DSP) provides a comprehensive overview of how the utility manages its electricity distribution assets and plans for future investments to deliver safe, reliable, and cost-effective service to customers over the 2026-2030 period. The DSP is included in this Application as Schedules 2-5-1 through 2-5-9, and encompasses the following key areas:

- **Coordinated Planning with Third Parties:** Details how Hydro Ottawa coordinates infrastructure planning with customers, transmitters, other distributors, the IESO and other third parties where appropriate.
- **Performance Reporting:** Outlines how Hydro Ottawa tracks key performance indicators to monitor the effectiveness of its asset management practices and ensure performance targets are met.
- **Asset Management Strategy:** Details how Hydro Ottawa identifies, assesses, and manages risks and opportunities associated with its infrastructure. This includes the utility's approach to maintenance, refurbishment and equipment replacement.
- **Capital Expenditure Plan:** Details Hydro Ottawa's planned investments in the distribution system, which includes upgrades, expansions, and new technologies aimed at improving reliability, safety, and accommodating load growth.
- **Material Investments:** Details capital expenditure projects and programs that meet Hydro Ottawa's materiality threshold. Material investments are grouped by the four investment categories identified by the OEB, namely System Access, System Renewal, System Service and General Plant.

Hydro Ottawa's 2026-2030 DSP is a comprehensive roadmap for managing and investing in the electricity distribution system. It outlines a systematic approach used to collect and analyze

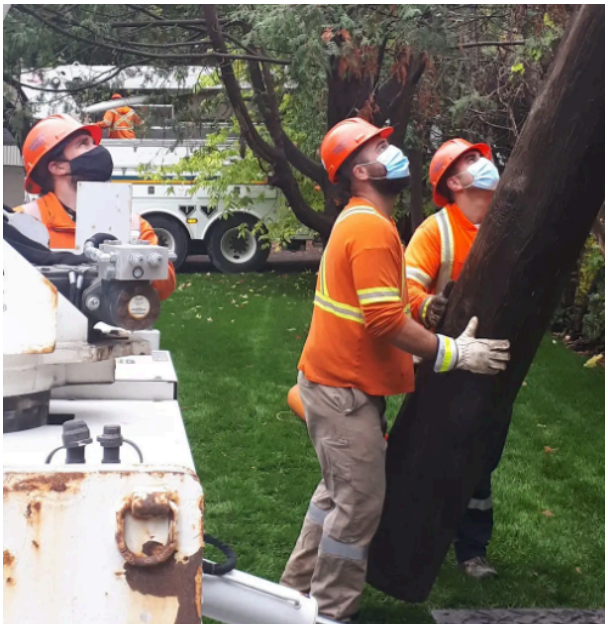
information on physical assets, current and future system operating conditions, and Hydro Ottawa's business and customer service goals. This thorough assessment allows Hydro Ottawa to strategically prioritize and optimize expenditures related to system upgrades, maintenance, and overall operation. The DSP ensures that Hydro Ottawa's investments are aligned with its overarching goals and the current and future needs of customers and the electricity grid.

Hydro Ottawa continuously maintains and improves its robust asset management practices. The ongoing evaluation and adjustment of the processes and information informing the DSP ensure alignment with evolving industry best practices, regulatory changes, and emerging technologies. This proactive asset management approach supports the achievement of the OEB's four RRF performance outcomes: Customer Focus, Operational Effectiveness, Public Policy Responsiveness, and Financial Performance, contributing to the safe, reliable, and sustainable electricity service essential for community growth and economic development.

The DSP was developed in alignment with the OEB's *Chapter 5 Filing Requirements for Electricity Distribution Rate Applications - 2025 Edition for 2026 Rate Applications*, dated December 9, 2024, as well as with the *Handbook for Utility Rate Applications* issued by the OEB in 2016.

1.1. CONTEXT

Between 2021 and 2024, Hydro Ottawa faced an unprecedented series of unforeseen challenges that tested its resilience. These challenges included the COVID-19 pandemic and its associated supply chain disruptions and inflationary pressures; a historic storm (the 2022 Derecho) that caused extensive damage to the electricity grid; eleven other major weather events requiring emergency response; and a 84-day strike in 2023. Despite these obstacles, Hydro Ottawa's robust systems and processes, coupled with its agile approach to adapting priorities and programs, enabled the utility to effectively assess and navigate these extraordinary circumstances. This resilience and adaptability allowed for continued progress towards the goals outlined in the 2021-2025 DSP, underscoring Hydro Ottawa's commitment to operational continuity and achieving its long-term strategic objectives.

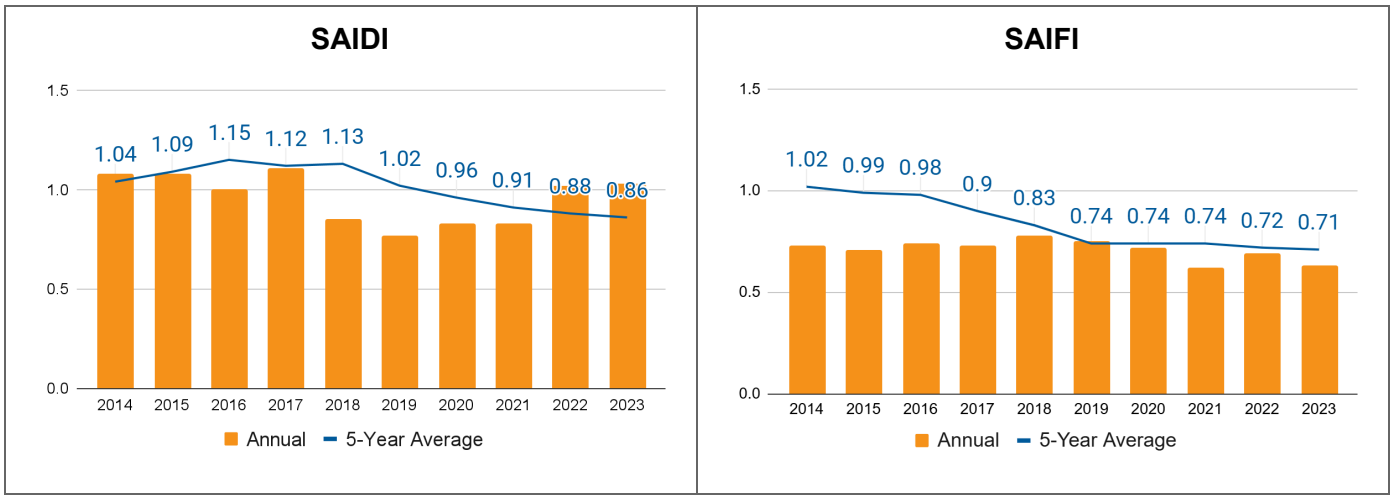


Hydro Ottawa crew during COVID-19

Hydro Ottawa's 2021-2025 DSP, as filed in its 2021-2025 Custom Incentive Rate-Setting (Custom IR) Application,[1] focused on expanding system capacity and renewing aging infrastructure. This included strategic investments to increase system capacity by 160MVA (Cambrian-100MVA, Limebank-33MVA and Uplands-27MVA) through new station construction and upgrades. The distribution capacity upgrade program also significantly unlocked new distribution line capacity. Targeted infrastructure renewal projects supported the overall improvement to system reliability as evidenced by the reduction to the 5-year average SAIDI and SAIFI performance excluding Loss of Supply and Major Event Days, shown in Figure 1.

[1] Hydro Ottawa Limited, *2021-2025 Custom Incentive Rate-Setting Distribution Rate Application*, EB-2019-0261 (February 10, 2020).

Figure 1 - SAIDI & SAIFI - Annual and 5-Year Average (Excluding Loss of Supply and Major Event Days)



Restoration work after the 2022 Derecho

Hydro Ottawa's 2026-2030 DSP outlines a comprehensive investment strategy that aligns with customer expectations and addresses the evolving needs of Hydro Ottawa's electricity grid. The updated 2026-2030 plan incorporates key improvements, including enhanced asset management processes, expanded grid modernization and resilience planning, updated system capacity assessments, and refined long-term forecasting based on customer feedback and system needs.

Hydro Ottawa has identified four strategic investment priorities for its 2026-2030 DSP. These priorities were determined through a comprehensive analysis that considered customer preferences identified through engagement activities, system needs, historical system performance, and trends identified through the business planning process.[2] The four Investment Priorities are:

1. **Growth & Electrification - Powering the Growing Community:** Focusing on expanding grid capacity to serve a growing community and ensure a reliable, resilient electricity system capable of meeting increasing demand driven by new customer connections and distributed energy resources (DERs).
2. **Renewing Deteriorating Infrastructure:** Focusing on mitigating reliability risk by strategically upgrading or replacing deteriorating and critical infrastructure, prioritizing assets with the greatest impact on system reliability and safety based on condition assessments.
3. **Grid Modernization - Enabling the Energy Transition:** Focusing on modernizing the grid through strategic technology adoption and infrastructure upgrades to enable the energy transition, facilitate customer participation, and optimize DER integration, thereby enhancing grid capabilities and efficiency.
4. **Enhancing Grid Resilience:** Focusing on enhancing grid resilience by proactively upgrading infrastructure and implementing measures to protect against increasingly frequent and intense severe weather events and cyber threats.

[2] For further details on Hydro Ottawa's business planning process, see Schedule 1-2-3 - Business Plan.

These four investment priorities address Hydro Ottawa's key distribution system planning challenges and opportunities, supported by two foundational focuses: Managing Rising Costs and Investing in the Workforce. In all aspects of planning, execution and performance monitoring, Hydro Ottawa emphasizes maintaining affordability for customers while ensuring a reliable and resilient electricity system to meet growing demand. To accomplish the priorities set out in this plan, Hydro Ottawa recognizes the importance of workforce development and safety to ensure a skilled and secure energy future.

1.2. 2026-2030 CAPITAL EXPENDITURE PLAN

Hydro Ottawa's planned capital investments for 2026-2030 represent a significant increase compared to the previous five-year period, reflecting the substantial challenge of modernizing and expanding the grid to meet the evolving needs of the community. The scale of these investments underscores Hydro Ottawa's commitment to providing safe and reliable electricity to the City of Ottawa and Municipality of Casselman while ensuring resilience in the face of climate change.

Figure 2 below provides a visual representation of 2026-2030 planned expenditures by Investment Priority.

Clearing damaged equipment after the May 2022 Derecho

Figure 2 - 2026-2030 Capital Expenditure by Investment Priority

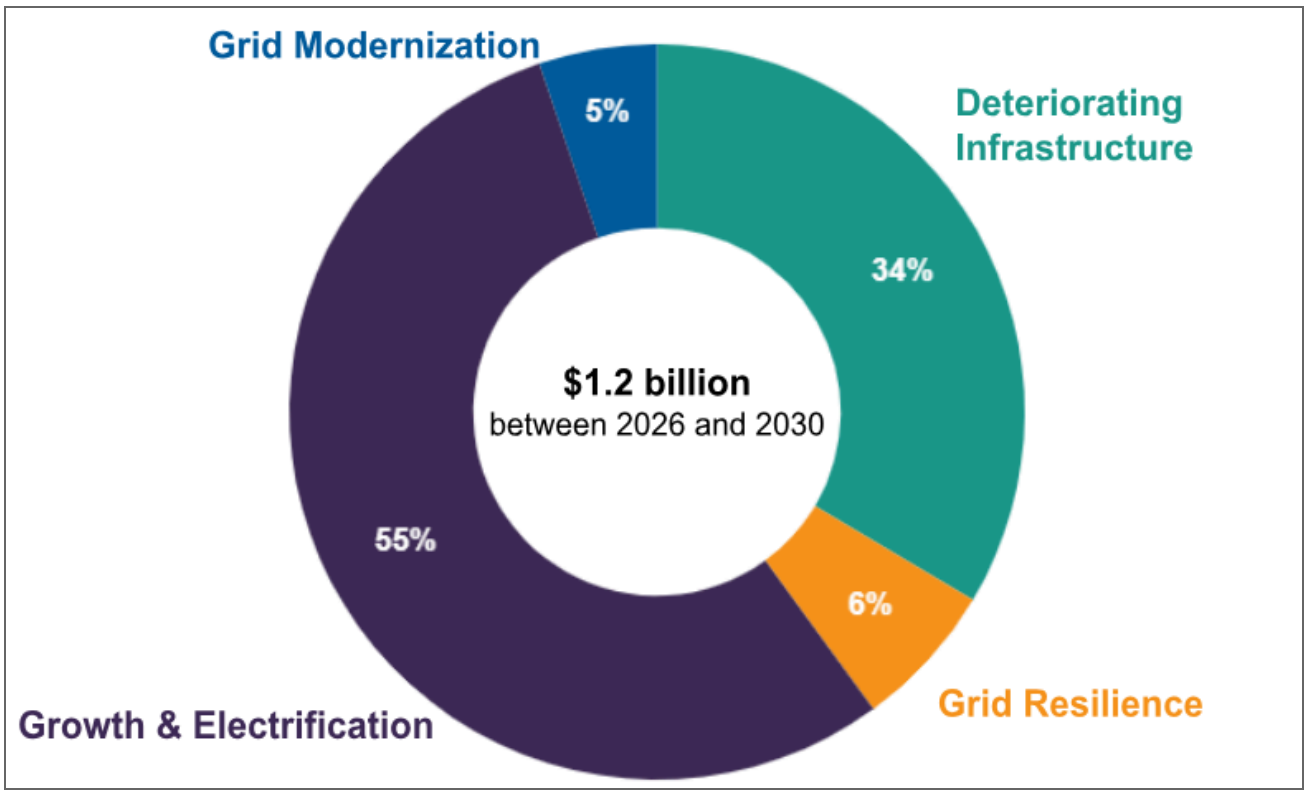


Table 1 below outlines the variance between Hydro Ottawa's 2021-2025 and 2026-2030 planned investments by investment category.

Table 1 - Capital Expenditure Variance by Investment Category - 2021-2025 DSP vs. 2026-2030 DSP ($'000 000s)

Investment Category	Historical / Bridge Years	Test Years	Variance
	2021-2025	2026-2030	
System Access	$ 293	$ 369	$ 77
System Renewal	$ 232	$ 432	$ 199
System Service	$ 161	$ 473	$ 312
General Plant	$ 76	$ 134	$ 57
Total Capital Expenditures	**$ 762**	**$ 1,409**	**$ 646**
Capital Contributions	$ (162)	$ (213)	$ (51)
Net Capital Expenditures	**$ 600**	**$ 1,195**	**$ 595**

Hydro Ottawa's 2026-2030 DSP strikes a balance between customer priorities and system needs, representing the minimum investment required to ensure a reliable, resilient and sustainable electricity grid. Through strategic planning and prudent investment aligned with customer priorities, Hydro Ottawa is committed to meeting the evolving energy needs of the community while ensuring continued safe, reliable and affordable electricity for its customers.

2. KEY ELEMENTS OF THE DSP

This section details the key elements included within the DSP. It outlines the essential components and considerations that shape the DSP's development and implementation, ensuring a robust and effective approach to managing the distribution system. Key elements of the 2026-2030 DSP include details of the updates to the DSP since filed with the 2021-2025 Rate Application, customer priorities, the challenges and trends faced by the utility, and resulting focus areas that inform investment plans.

2.1. CHANGES IN THE DSP

The following sections detail the key changes that impact the inputs into the DSP since the previous DSP submission in the 2021-2025 rate application.

2.1.1. Asset Management Process

To ensure a reliable, resilient, and customer-centric electricity grid, Hydro Ottawa has made significant enhancements to its asset management process. These improvements, centered on predictive analysis, refined testing, inspection, and maintenance, and a more robust ACA framework, reflect a forward-thinking approach that strategically aligns asset management practices with the company's broader objectives and customer needs. Hydro Ottawa has also continued to demonstrate a commitment to advanced asset management, evidenced by initially achieving ISO 55001 Asset Management Standard certification in 2020 and recertified in 2023. This certification highlights the maturity of the asset management system, which includes enhancements like a comprehensive risk register and targeted mitigation plans. These practices support strategic asset decision-making, balancing cost, risk, and performance to meet customer expectations and regulatory requirements.

A key enhancement is the incorporation of predictive analysis into system renewal investment planning. This involves using the Copperleaf Asset Predictive Analytics (PA) module to model distribution assets and forecast system renewal needs. This predictive capability allows Hydro Ottawa to move towards a more proactive approach by predicting the effects of asset degradation over time and optimizing replacement schedules. The PA module analyzes asset data, including condition and risk information, to forecast the impact of asset degradation and inform investment decisions. This analysis helps determine the optimal timing for interventions like replacements or upgrades, considering factors such as risk mitigation and cost-effectiveness. By leveraging PA, Hydro Ottawa aims to make higher-value investment decisions, ultimately improving the management of its assets.

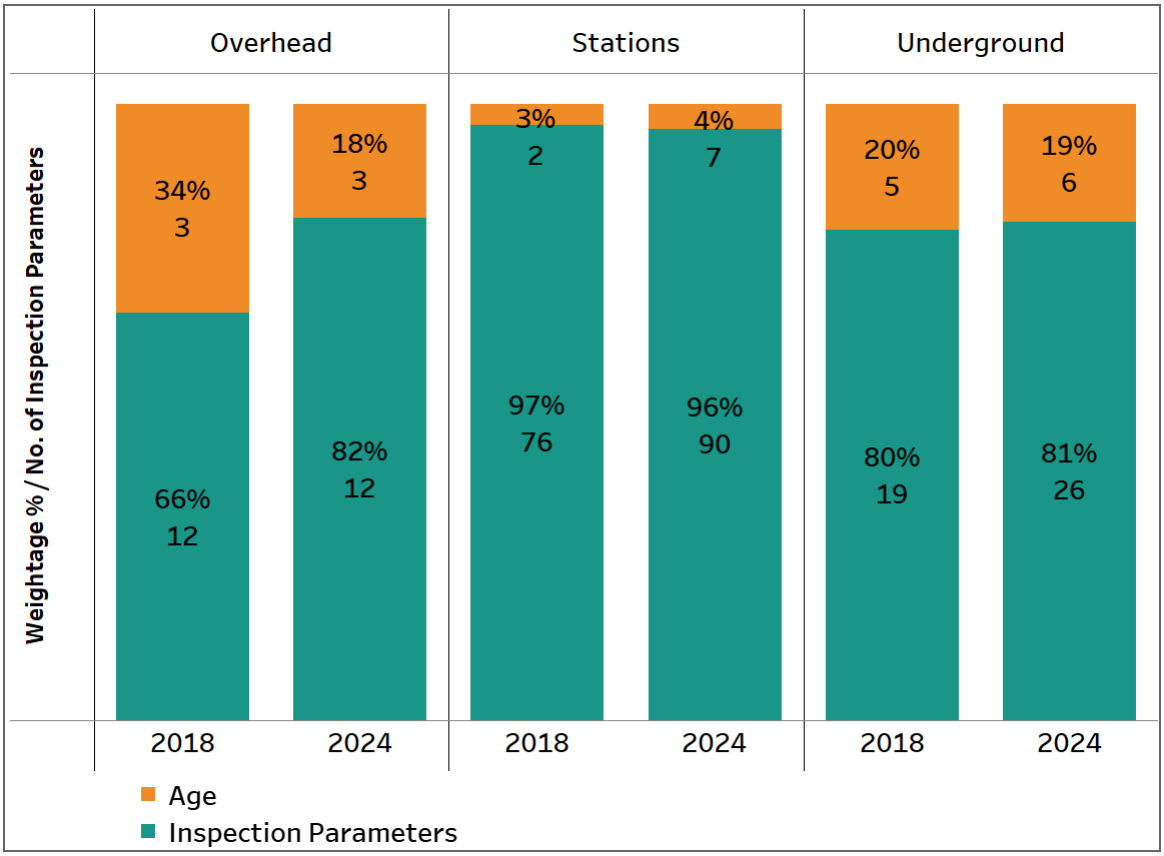
In addition to PA, Hydro Ottawa has also significantly refined its testing, inspection, and maintenance programs. These refinements aim to capture more detailed data on asset conditions. For instance, the overhead asset inspection program now captures information on pole-mounted transformers, switches, and related hardware at every pole inspected, rather than only when an issue is found. This provides a more comprehensive understanding of the health of these assets. For underground infrastructure, Hydro Ottawa has enhanced its cable testing methodology, incorporating advanced testing methods such as Very Low Frequency Tan-Delta, Partial Discharge, and Time Domain Reflectometry. These advanced techniques provide a deeper understanding of the condition of cable components, facilitating more targeted remediation efforts. This improved data collection allows for more precise condition assessments to inform investment planning.

Hydro Ottawa has also enhanced its Asset Condition Assessment (ACA) framework to provide a more accurate and comprehensive evaluation of asset health. A key improvement involves incorporating additional condition parameters derived from testing, inspection, and maintenance programs into the calculation of asset health index scores. This integration of diverse data sources results in a more holistic view of an asset's condition.

Hydro Ottawa's Asset Condition Assessment framework has undergone significant evolution between 2018 and 2024, as evidenced by the data presented in Figure 3 below. A notable shift from age-based to condition-based asset evaluation is demonstrated across various asset categories. For overhead assets, the reliance on age was substantially reduced due to improvements to the condition assessment framework for poles, alongside moderate improvements to condition data quality from Overhead (OH) switches and transformers through ground-based inspections. Station assets saw a significant increase in the number of parameters utilized, reflecting the integration of previously underutilized inspection data, with minimal reliance on age. Underground assets experienced an increase in assessment parameters, though the reliance on age remains comparatively higher. However, Hydro Ottawa has implemented ongoing improvements to the cable testing and vault inspection programs,

demonstrating a commitment to enhancing condition data accuracy. Hydro Ottawa's strategic enhancements to the ACA framework underscore a commitment to proactive maintenance and risk management, aligning with industry best practices and emphasizing the importance of real-time, accurate condition data for informed decision-making.

Figure 3 - Hydro Ottawa's ACA Framework Enhancements



More information on Hydro Ottawa's ACA process can be found in Section 5.1.2.1 of Schedule 2-5-4 - Asset Management Process.

These improvements collectively contribute to a more data-driven and risk-based approach to asset management, enabling Hydro Ottawa to optimize investments, enhance reliability, and

ensure the long-term sustainability of its electricity grid. More details on the improvements that Hydro Ottawa made to its Asset Management Process are provided in Section 4.4 of Schedule 2-5-4 - Asset Management Process.

2.1.2. Grid Modernization

Grid Modernization Strategy & Roadmap Creation

Recognizing the challenges and opportunities of the evolving energy landscape, Hydro Ottawa engaged Hatch in 2022 to develop a comprehensive Grid Modernization Strategy and Roadmap. This initiative prioritized enhancing grid reliability, flexibility, resilience, and sustainability through a methodical, two-phased approach.

The first phase began with establishing a baseline maturity level by completing an assessment of Hydro Ottawa's existing grid infrastructure and operational capabilities. This evaluation was then compared against a desired future state vision across various time horizons, which revealed key areas for improvement. The second phase of the project used these key findings to develop the Grid Modernization Strategy, also drawing upon existing corporate directives, operational plans, ongoing initiatives, and industry best practices to ensure alignment and efficacy. This structured approach was designed to ensure that Hydro Ottawa's grid modernization efforts are strategically aligned, operationally sound, and effectively address the evolving demands of the energy landscape.

The Grid Modernization Strategy translates the corporate priorities into actionable objectives, which are then translated into investment plans by informing the objectives of both the Asset Management and Digital strategies. For more information, please see Section 3.4 of Schedule 2-5-4 - Asset Management Process. This ensures coordinated investment and avoids duplicated effort or inefficiencies that could arise from shared asset accountabilities. Specifically, it allows for sole oversight and coordination of distribution assets under the Asset Management framework and information technology assets under the Digital framework.

The Grid Modernization Roadmap operationalizes the Grid Modernization Objectives in conjunction with the Capital Expenditure plan. The Strategy defines the needs, which are then translated through the Asset Management and Digital Strategies into concrete investment plans. These plans are consolidated within the capital expenditure planning process and monitored through the Grid Modernization Roadmap to ensure the Grid Modernization Objectives are achieved.

April 2023 Ice Storm

More details on the Grid Modernization Strategy are available in Section 3.4.2 of Schedule 2-5-4 - Asset Management Process.

2.1.3. Resilience

As part of Hydro Ottawa's ongoing commitment to grid resilience and service reliability, a 2023 Climate Study Reaffirmation and the Resilience Investment Business Case assessments were undertaken. See Attachment 2-5-4(B) - Addendum Report to Distribution System Climate Vulnerability Risk Assessment and Climate Change Adaptation Plan and Attachment 2-5-4(E) - Resilience Investment Business Case Report, respectively. These assessments support planning to enhance grid resilience and prioritize system reliability in the face of increasingly frequent severe weather events and growing dependence on stable power. The Climate Study Reaffirmation reconfirmed the necessity of continued adaptation and mitigation strategies, while the Resilience Investment Business Case Report offered a data-driven approach to identify and prioritize areas for strategic undergrounding of overhead lines.

Hydro Ottawa's resilience assessment aligns with the OEB's new and ongoing Vulnerability Assessment and System Hardening (VASH) framework, which intends to set out how distributors should incorporate climate resilience into their asset and investment planning to mitigate climate-related vulnerabilities. Hydro Ottawa uses an asset-based approach, leveraging climate forecast data from models developed by Burns & McDonnell's subsidiary 1898 & Co. by quantitatively comparing asset threshold criteria with the probability of extreme weather events during the project evaluation stage, Hydro Ottawa ensures investments enhance climate resilience within the distribution system.

Assessing Damage after the 2022 Derecho

Climate Study Reaffirmation

In 2023, Hydro Ottawa commissioned Stantec Consulting Ltd. to conduct a study to update the 2019 climate risk assessment,[3] incorporating the latest climate projection data and factoring in recent extreme weather events, including the 2022 Derecho storm. This comprehensive assessment utilized updated climate models and regional projections to refine the probability estimations of extreme weather events. Notably, two new wind speed thresholds, exceeding 130 km/h and 180 km/h, were introduced based on updated criteria and empirical observations from the 2022 Derecho storm. This led to a reassessment of potential high-wind impacts on infrastructure, resulting in elevated consequence ratings.

Despite the increased risk scores associated with severe wind events, the overall risk level for the majority of Hydro Ottawa's infrastructure remains unchanged. This finding indicates that the adaptation and mitigation measures outlined in the 2019 plan retain their efficacy. Consequently, the primary areas of vulnerability within Hydro Ottawa's system, namely overhead assets, remain consistent with previous assessments.

As a result, Hydro Ottawa commissioned a further study to explore strategic opportunities for undergrounding vulnerable sections of overhead lines to enhance the overall resilience of the electricity distribution system. Further details on the study's findings can be found in Section 4.4.8 of Schedule 2-5-4 - Asset Management Process.

Resilience Investment Business Case

Hydro Ottawa engaged 1898 & Co. to conduct a comprehensive assessment and develop a Resilience Investment Business Case for strategically burying vulnerable sections of the overhead distribution system. Refer to Attachment 2-5-4(E) - Resilience Investment Business Case Report. The report emphasizes the growing importance of grid resilience, highlighting the

[3] See Hydro Ottawa Limited, *2021-2025 Custom Incentive Rate-Setting Distribution Rate Application*, EB-2019-0261 (February 10, 2020), Attachment 2-5-4(B): Addendum Report to Distribution System Climate Vulnerability Risk Assessment and Climate Change Adaptation Plan.

increasing frequency of severe weather events and the community's dependence on reliable service. Employing a data-driven model, the study identified and prioritized resilience investments, focusing on the strategic conversion of overhead lines to underground systems.

Hydro Ottawa integrated the study's findings with empirical evidence from recent storm events to proactively incorporate resilience investments into the capital plan. The resulting Distribution System Resilience program encompasses a multi-faceted approach, including:

- Strategic undergrounding of vulnerable overhead lines;
- Reinforcement of existing overhead infrastructure;
- Feeder reconfiguration;
- Undergrounding of station egress points; and
- Relocation of lines.

April 2023 Ice Storm

These investments are designed to mitigate system disruptions caused by severe weather events, ultimately minimizing restoration costs, customer outage durations, and overall system recovery time.

A detailed description of the Distribution System Resilience program is provided in Section 3 of Schedule 2-5-8 - System Service Investments.

2.1.4. System Planning

Decarbonization Study

Decarbonization targets set out by federal and municipal bodies are increasingly impacting Hydro Ottawa's distribution system. Traditional forecasting methods which primarily rely on historical consumption patterns and projected growth based on known and observable trends fail to capture the uncertainties introduced by decarbonization goals and the resulting electrification of building, water heating and transportation. Recognizing this gap, the IESO created a Decarbonization Sub-Working Group to support studying the impacts of electrification on regional forecasts. In support of this sub-working group, Hydro Ottawa commissioned Black & Veatch in 2023 to conduct a Decarbonization Study, included in this Application as Attachment 2-5-4(F) - Decarbonization Study. This study evaluates the potential impacts of societal electrification trends on Hydro Ottawa's distribution system out to 2050 with a scenario-based approach. Five scenarios with varying assumptions of decarbonization initiatives on the distribution system are assessed in the Study with refinement from the Decarbonization Sub-Working Group. More details about this group are provided in Section 4 of Schedule 2-5-2 - Coordinated Planning with Third Parties.

Hydro Ottawa is utilizing the Decarbonization Study's Reference Scenario forecast to inform its Integrated Regional Resource Plan (IRRP) forecast. This alignment is crucial for long-term regional transmission planning, given the extended lead times of transmission grid investments. Recognizing the uncertainties associated with government policies and technological advancements, Hydro Ottawa leveraged the forecast derived from the Decarbonization Study's

Reference scenario to augment its own investment decisions. Hydro Ottawa's 2026-2030 capital expenditure plans balance investment needs with affordability by prioritizing a mix of wire and Non-Wire Solutions (NWSs). Investments are focused on already constrained regions and areas with immediate, confirmed, and committed load requirements necessary to meet customer service obligations. These infrastructure investments were sized to accommodate demand growth projections in the IRRP forecast through 2035 to ensure efficient capital deployment. The most notable examples of projects, programs or updates that were informed by the decarbonization study include (a) the decision to increase the capacity of the Hydro Road, Cyrville, Kanata North and Greenbank stations to align with Hydro Ottawa's standard 100MVA design, (b) the decision to convert voltage levels to 13kV when replacing deteriorated 4kV station assets to support intensification and other known large projects such as the New Ottawa Hospital and (c) the reaffirmation of Hydro Ottawa's residential transformer sizing guideline. This strategic approach balances immediate operational demands with long-term sustainability goals thereby optimizing capital allocation and asset utilization. By leveraging decarbonization projections to inform the mid to long term outlook (beyond 2030) and aligning investments with both near-term (until 2030) and future needs, Hydro Ottawa ensures the development of a reliable, resilient, and cost-effective power grid capable of supporting the transition to a sustainable, net-zero energy future.

Further details on the Decarbonization Study are available in Section 9 of Schedule 2-5-4 - Asset Management Process, and Attachment 2-5-4(F) - Decarbonization Study.

2.2. CUSTOMER PRIORITIES

Hydro Ottawa prioritizes ongoing customer engagement as a core component of its business operations. This commitment is reflected in various initiatives and channels designed to gather customer feedback, understand evolving needs, and ensure a customer-centric approach to service delivery. For details on Hydro Ottawa's ongoing customer engagement initiatives, please see Schedule 1-4-1 - Customer Engagement Ongoing. Hydro Ottawa's 2026-2030 DSP was developed with extensive and targeted customer input gathered in two phases in collaboration

with Innovative Research Group Inc, a national consulting firm with extensive expertise in public opinion research and specifically in the context of energy policy and utility operations. Phase I focused on strategy, and sought input aimed at understanding customer needs and preferences. This was distilled into priorities and principles that Hydro Ottawa planners and subject matter experts were guided by in developing the draft distribution system and business plans (as reflected in the "Needs and Preferences Planning Placemat" in Appendix.08 of the consolidated Customer Engagement Report found in Attachment 1-4-2(A) - Customer Engagement Report on Hydro Ottawa's 2026-2030 Rate Application). In Phase II, the Customer Engagement process focused on gathering customer feedback on Hydro Ottawa's proposed investment plan. This was achieved through an online survey that presented the plan's four key categories: Growth and Electrification, Aging Infrastructure, Grid Modernization, and Grid Resilience. The survey aimed to gauge customer investment preferences across these categories and assess the overall level of support for the proposed plan by outlining priority investment options with varying paces and cost impacts, enabling them to directly influence the final plan by providing feedback on their preferred balance of cost, timing, and system outcomes (reliability, resilience, renewable integration).

Key Findings:

- **Strong Support for the Plan:** The results demonstrated strong overall support for the plan, particularly among commercial customers who recognize the value of a reliable and modern electricity grid. An average of 87% of customers, across all rate classes, gave Hydro Ottawa social permission to proceed with its draft plan. These customers provided social permission by indicating either:
    - 16% think Hydro Ottawa should accelerate spending beyond the level in the draft plan to deliver better system outcomes.
    - 28% support the proposed rate increase that is reflected in the draft plan, or
    - 43% feel that the proposed rate increase in the draft plan is necessary, even though they don't like the proposed rate increase.

- **Acceptance of Necessary Increases:** While many customers expressed a general dislike for bill increases, a majority within each customer category acknowledged the necessity of these increases to fund critical system investments.
- **Desire for Accelerated Investment:** A significant minority of respondents favored an even faster pace of investment, indicating a willingness to absorb higher near-term costs to expedite system upgrades and realize their associated benefits sooner.

A summary of Hydro Ottawa's customer engagement on the 2026-2030 Application priorities are summarized below, with fulsome details available in Schedule 1-4-2 - Customer Engagement on the 2026-2030 Application.

Phase I

Phase I took place from February to May 2024 and focused on understanding customer needs through focus groups and interviews. This comprehensive approach ensured that diverse customer perspectives were gathered and analyzed to shape Hydro Ottawa's investment plan from its early stages.

Engagement results and key findings from Phase I, in relation to satisfaction and general priorities, include:

- Customer satisfaction has improved relative to 2019 for residential and small business customers.
- Residential and small business customers prioritize very similar general outcomes, with both ranking "maintaining reliable electricity service" as their top priority.
- Commercial and industrial and key account customers have more distinctive prioritizations, with reliable service being important, but outranked by the related and more specific objective of hardening the grid to withstand severe weather. Capacity to meet future demand was also a high-ranked priority of these customer classes.

Phase II

Phase II was conducted from September to October 2024 through an online survey to gauge customer investment preferences across four investment priorities that were identified throughout Phase I. These four priorities are: Growth and Electrification, Aging Infrastructure, Grid Modernization, and Grid Resilience. The majority of customers across all categories supported the proposed plan, with many even encouraging Hydro Ottawa to exceed it. Feedback was obtained from 21,8399 customers during this phase. Table 2 outlines the identified priority rankings by customer class.

Table 2 - Customer Priority Ranking by Category[4]

Investment Priority	Customer Category		
	Residential	Small Business	Commercial & Industrial and Key Account
Grid Resilience	1	1	2[5]
Grid Modernization	2	2	2
Aging Infrastructure (replacing equipment)	3	3	1
Metering Renewal	4	5	5
Growth and Electrification	5	4	4

In Phase II customers reviewed a draft plan outlining the four identified priority investment categories, presenting various options with different paces and cost implications. This allowed customers to directly influence the final plan by providing feedback on their preferences regarding the balance between cost, timing, and system outcomes (i.e. reliability, resilience, renewable integration).

2.3. INVESTMENT PRIORITIES

Through business planning and asset management processes, Hydro Ottawa has identified four

[4] Customer priority ranking was determined by adding support for Accelerated Pace and Draft Plan
[5] Grid Resilience and Grid Modernization received the same ranking

strategic Investment Priorities in this DSP. These priorities have been validated through customer engagement, ensuring that investments address the most pressing needs of both the community and the electricity grid, and are aligned with customer's top concerns: resilience against severe weather, reliability, reasonable rates, and grid capacity expansion. By focusing on these key areas, Hydro Ottawa aims to create a resilient and sustainable electricity system that can meet the evolving demands of the community while ensuring service remains safe, reliable, and affordable.

The four Investment Priorities are:

- **Growth & Electrification:** Powering a Growing Community
- **Renewing Deteriorating Infrastructure**
- **Grid Modernization:** Enabling the Energy Transition
- **Enhancing Resilience**

These Investment Priorities are underpinned by two Focus Areas:

- **Managing Rising Costs:** Ensuring customer affordability amidst economic uncertainties.
- **Investing in the Workforce:** Developing a robust and skilled workforce to navigate the evolving energy landscape.

By strategically balancing system upgrades with affordability and investing in its workforce, Hydro Ottawa is building a resilient and sustainable electricity system. Customer surveys, detailed in Section 3.3 of Schedule 2-5-4 - Asset Management Process, demonstrate strong support for the capital plan, confirming the effectiveness of this customer-centric approach.

2.3.1. Growth & Electrification - Powering a Growing Community

Focusing on expanding grid capacity to serve a growing community and ensure a reliable, resilient electricity system capable of meeting increasing demand driven by new customer connections and distributed energy resources (DERs).

To meet Ottawa's growing energy needs driven by electrification and expansion, Hydro Ottawa is strategically evolving its infrastructure and operations through 2030.

The City of Ottawa is experiencing consistent expansion, with ongoing residential development driving increasing demands on Hydro Ottawa. The utility's residential customer connection volumes illustrate this growth. These volumes have increased from a budgeted annual average of 3,190 to actuals of 6,067 over the 2021-2023 period. This upward trend is projected to

continue, fueled by the City of Ottawa's forecasted population growth at a rate of 1.3% CAGR[6] over the 2026-2031 period and provincial emphasis on new housing development, as evidenced by the *More Homes Built Faster Act, 2022.*[7] For details on this, see Section 3.5.1, Schedule 2-5-6 - System Access Investments.

Electrification is also profoundly influencing electricity demand, adding significant pressure to the system. And this trend is expected to continue as Federal Government legislation requires 60% of all light duty vehicles sold in Canada to be electric vehicles by 2030 and 100% by 2035, compared to 9% of vehicles sold in 2021.[8] The increasing adoption of electric vehicles represents a substantial load growth factor, with the electrical demands of EV charging, particularly when concentrated and simultaneous, requiring robust grid reinforcement, especially around public charging facilities. For example, Hydro Ottawa has planned grid infrastructure investments to support the City of Ottawa's plan to procure 354 electric buses by 2027 and a full transition to electric buses by 2036[9]. Refer to Section 4.3.2, Schedule 2-5-6 - System Access Investments for additional details.

Similarly, the growing adoption of electric space heating contributes to increased electricity consumption, particularly during peak winter demand periods. These trends necessitate infrastructure upgrades to accommodate higher loads and maintain system reliability with heat pumps projected to provide more than 50% of residential space heating needs by 2050, up from 6% in 2021.[10]

[6] City of Ottawa, "Growth projections for Ottawa: 2018-2046," https://ottawa.ca/en/living-ottawa/statistics-and-demographics/growth-projections-ottawa-2018-2046#section-26e79cf6-0a3c-4ab0-92fe-6a0c44150b93
[7] Legislative Assembly of Ontario, "Bill 23, *More Homes Built Faster Act, 2022.*"
[8] Statistics Canada, "Watt's up? Electric Vehicles and future electricity generation needs," https://www.statcan.gc.ca/o1/en/plus/5497-watts-electric-vehicles-and-future-electricity-generation-needs
[9] Ottawa-Carleton Transportation, "Zero-Emission Bus," https://www.octranspo.com/en/our-services/vehicles/zero-emission-bus/
[10] Canada Energy Regulator, "Canada's Energy Future 2023: Energy Supply and Demand Projections to 2050," https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2023/

Hydro Ottawa is witnessing a significant escalation in large load requests, exceeding 5 MVA, fueled by the accelerating trend of electrification. Since 2018, the utility has recorded a marked upswing in large load connection requests and inquiries, and the pace of demand notably quickened from 2023 onwards. This burgeoning load profile is clearly depicted in Figure 4, which breaks down 110 MVA of large loads successfully integrated into the grid between 2010 and 2023 (blue), 113 MVA of confirmed customer commitments, secured through signed Offers to Connect and slated for completion by 2028 (orange), and a further 199 MVA of potential load requests, encompassing preliminary inquiries through to formal load summary submissions (grey and green). Should these potential requests materialize by 2030, Hydro Ottawa anticipates an unprecedented 312 MVA increase in its total load demand over the 6 year span of 2024-2030; a three-fold increase from the 110MVA connected in the previous 10 years.

Figure 4 - Large Load Connections, Commitments, Requests & Inquiries

If all these requests materialize, this would represent an increase of 312 MVA by 2030, tripling the amount connected during the previous 14-year period.

Key examples of the projects driving these large load requests include the Ottawa Hospital's New Campus, OC Transpo's Zero Emission Buses, Department of National Defence Dwyer Hill Training Center Upgrade, new laboratory facilities for the Regulatory and Security Science Main Project (located at the Canadian Food Inspection Agency's Ottawa Laboratory), and the TerraCanada National Capital Area project (located at the National Research Council of Canada facilities).

To effectively address these converging challenges—increased residential connections, the electrification surge, and escalating demand from large-load customers—Hydro Ottawa is pursuing strategic and substantial investments, with a focus on:

Capacity Expansion: Investments in new substations, upgrades to existing facilities, and expansion of the distribution network to effectively manage increased load and ensure service reliability.

Grid Modernization: Initiatives to modernize the grid to better accommodate the dynamic load profiles associated with EV charging and electric heating, enhance grid flexibility and responsiveness, and DERs and integrate smart grid technologies.

Non-Wires Solutions (NWSs): Strategic implementation of NWSs, such as utility-owned battery energy storage systems and a Non-Wires Customer Solutions Program, to proactively manage peak demand, defer or avoid traditional infrastructure investments, and enhance grid reliability.

With anticipated growth and rapid rate of change across the City of Ottawa, Hydro Ottawa is committed to collaboration, working with developers and the City of Ottawa through various working groups, including the Utility Coordinating Committee, Energy Evolution, and the Decarbonization Working Group. These partnerships are essential to developing well-informed grid capacity enhancement plans and ensuring the continued provision of reliable electricity services to a dynamic and expanding community. This collaborative approach aims to support ongoing residential and commercial development, facilitate urban intensification initiatives, and enable major infrastructure projects within the community in a cost-effective manner.

2026-2030 Capital Expenditure Overview

Hydro Ottawa's proposed capital investments are driven by the need to adapt to the evolving energy landscape that is being reshaped by Growth & Electrification. The portfolio of

investments under Growth & Electrification focuses on expanding the electricity system to accommodate customer connections, forecasted demand and support the integration of DERs. This is achieved through investments in the System Access category, which includes programs like Customer Connections to facilitate new residential and commercial developments, System Expansion to address major infrastructure projects like new stations, and Generation Connections to enable the connection of customer-owned DERs. It is also achieved through investments in the System Service category where although the primary driver is dealing with capacity constraints it also allows efficient investment in programs that prepare the grid for the projected impacts of decarbonization and integration of distributed renewable energy resources. These proactive initiatives are essential to ensure the continued provision of reliable and sustainable electricity services, effectively managing the challenges and opportunities presented by these transformative trends, and ultimately, enabling a robust energy transformation in Ottawa.

2.3.2. Renewing Deteriorating Infrastructure

Focusing on mitigating failure risk by strategically upgrading or replacing deteriorating and critical infrastructure, prioritizing assets with the greatest impact on system reliability and safety based on condition assessments.

To ensure continued, safe, and reliable electricity delivery to its customers, Hydro Ottawa must proactively invest in renewing its deteriorating infrastructure.

Hydro Ottawa's enhanced asset management process, detailed in Section 4.4 of Schedule 2-5-4 - Asset Management Process, includes comprehensive ACAs to determine asset health and facilitate holistic risk assessment. These assessments reveal that 54% of Hydro Ottawa's assets have reached the end of their typical useful life (TUL) as shown in Figure 5 below, and 6% are in degraded (Poor or Very Poor) condition as shown in Figure 6 below.

Without intervention, these figures will worsen significantly. By 2030, the proportion of assets beyond their TUL is projected to increase to 67% as shown in Figure 7, and the percentage in degraded condition will rise to 10%, see Figure 8. This presents a growing and immediate risk of

asset failure, with the potential to disrupt electricity service. Hydro Ottawa estimates that replacing all assets projected to be in degraded condition by 2030 would cost $862M, as shown in Table 4.

Figure 5 - 2024 Overall Asset Age Demographics (Current State)

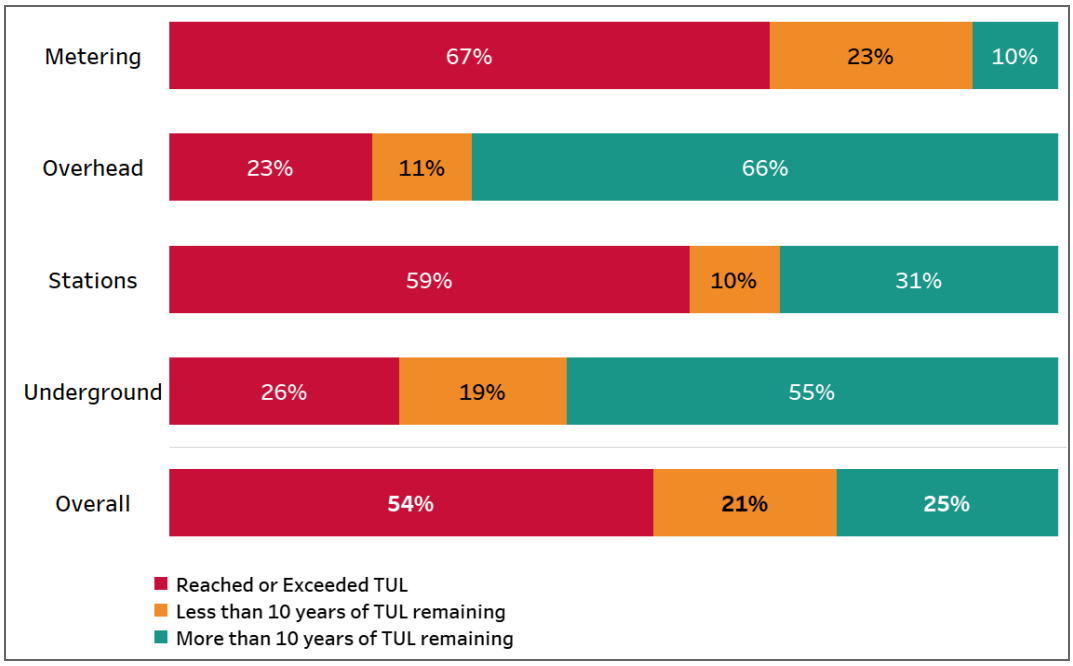


Figure 6 - 2024 Overall Asset Condition Profile (Current State)

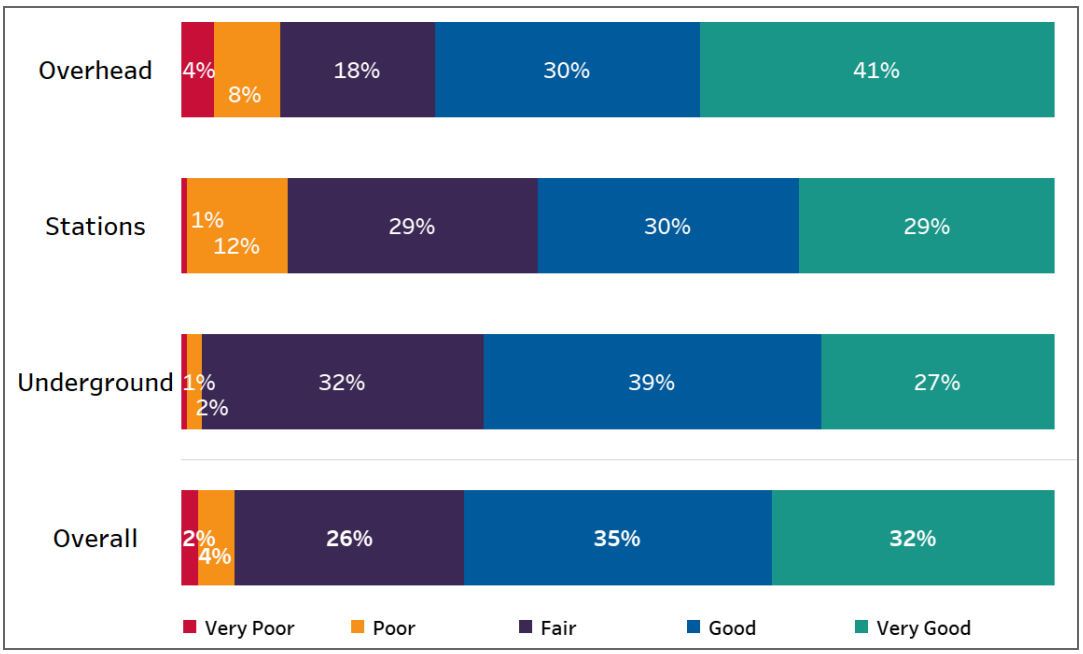


Figure 7 - 2030 Overall Projected Asset Age Demographics - 2030 (No Investment)

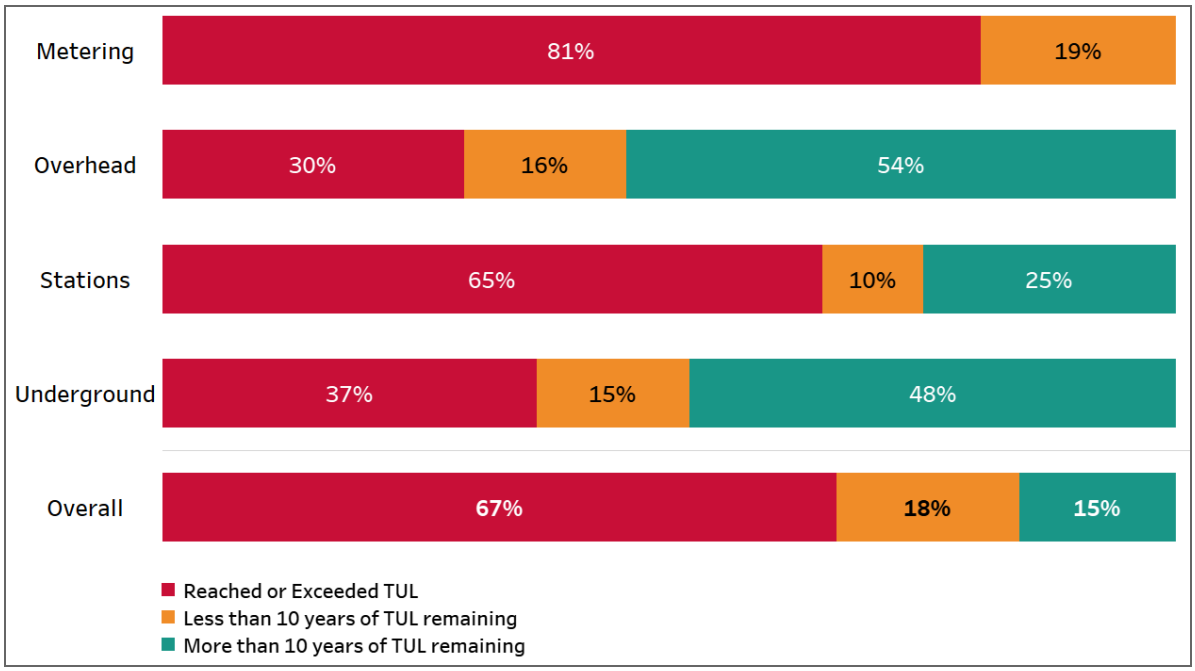
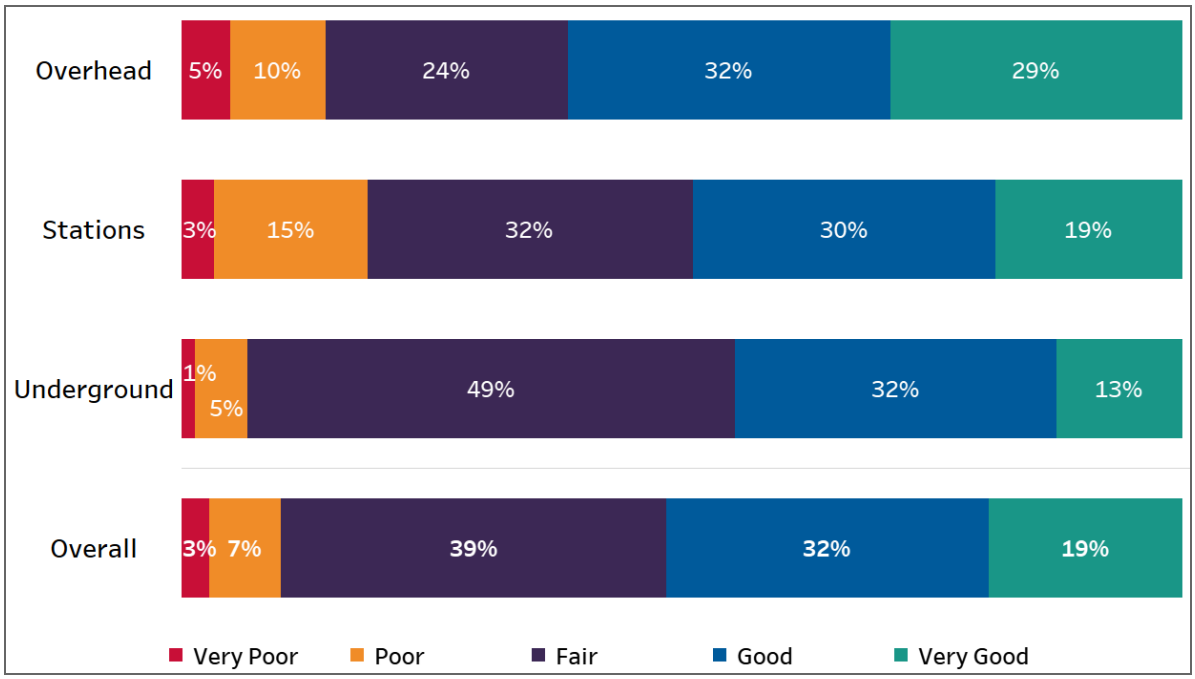


Figure 8 - 2030 Overall Projected Asset Condition Profile - 2030 (No Investment)

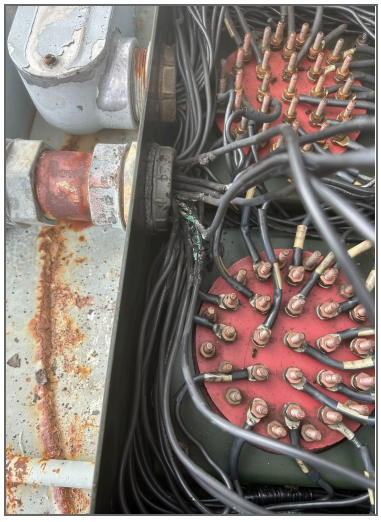


Figures 9 to 11 illustrate examples of deteriorating asset infrastructure found through inspection and maintenance programs.

Figure 9 - Examples of Station Asset Deterioration

(a) Station transformer corrosion and leaks

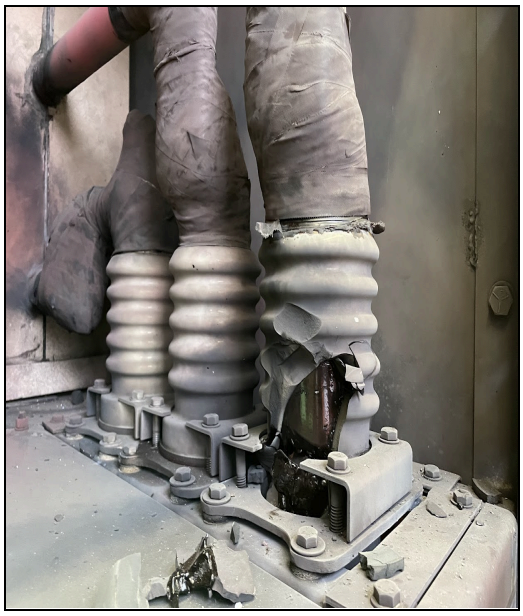
(b) Switching equipment lubrication leaks



(c) Corroded connections and burnt wiring

(d) Switchgear failure and fire

(e) Station outdoor infrastructure deterioration



(f) Pothead failure connected to station bus

Figure 10 - Examples of Underground Distribution Asset Deterioration

(a) Underground transformer corrosion

(b) Underground cable failure

1

Figure 11 - Examples of Overhead Distribution Asset Deterioration

(a) Pole decay

(b) Overhead switch operational defect

Hydro Ottawa's asset renewal strategy is to replace assets at a pace which maintains a consistent percentage of assets in degraded condition with the aim of maintaining overall system reliability. Hydro Ottawa prioritizes replacement of assets that pose the highest overall system risk by leveraging Predictive Analytics to forecast asset degradation based on the age and condition of assets. While safety, financial, environmental, and compliance risks are considered, reliability is the primary driver of the overall risk value.

Table 3 demonstrates the outcomes of the risk mitigation approach proposed by Hydro Ottawa for the 2026-2030 period. As outlined in the table, the investment required to replace all assets that are projected to be in degraded condition by 2030 is estimated at $862M - this would effectively reduce the percentage of assets in degraded condition to 0% by 2030. Competing financial priorities, notably growth, electrification, grid modernization, and resilience, render this investment level impractical. Alternatively, Hydro Ottawa is proposing an investment of $261M over the 5-year period, which is projected to result in 8% of the overall assets being in degraded condition by 2030, a 2% increase compared to 2024. Hydro Ottawa has demonstrated strong

reliability results through the 2021-2025 period, see Schedule 2-5-3 - Performance Measurement for Continuous Improvement. Despite the increase forecasted in overall percentage of assets in degraded condition, Hydro Ottawa expects to maintain the same level of service over the 2026-2030 period due to the improved risk prioritization stemming from the use of Predictive Analytics and the enhancements to the inspection and maintenance programs. Details of Hydro Ottawa's proposed System Renewal investments are provided in Schedule 2-5-7 - System Renewal Investments.

Table 3 - 2024 and 2030[11] Asset System Renewal Needs by Condition

Asset System	Hydro Ottawa's Current (2024) % of Assets in Degraded Condition	Investment Required to Replace all Assets Projected to be Degraded by 2030 (in 2024 dollars)	Hydro Ottawa's 2026-2030 Proposed System Renewal Investment	Hydro Ottawa's 2030 Projected Outcome for % Assets in Degraded Condition (after investment)
Overhead	12%	80 Overhead (OH) Switches, 5,737 Poles **$199M**	340 OH Switches, 1,975 Poles **$68M**	10%
Stations[12]	13%	53 Station Batteries,177 Station Breakers, 12 Station Transformers **$205M**	14 Station Batteries, 83 Station Breakers, 11 Station Transformers **$90M**	15%
Underground	3%	114 Cable Chambers, 28 Underground (UG) Switchgear, 336 km XLPE Cable, 1,972 Vault Transformers, 18 Vault Switchgear **$458M**	30 Cable Chambers, 30 UG Switchgear, 61 km XLPE Cable, 90 Vault Distribution Transformers, 30 Vault Switchgear **$103M**	6%
Total	**6%**	**$862M**	**$261M**	**8%**

[11] All costs are in 2024 dollars
[12] For Stations, the dollars shown don't consider relays, RTUs, station minor assets, buildings/facilities and transfer trip installations, as these asset types don't have condition information associated with them. These specific station assets follow an age-based replacement criteria and Hydro Ottawa has considered them in the 2026-2030 system renewal investment plans.

Hydro Ottawa's risk-mitigation asset renewal strategy relies heavily upon condition information from maintenance inspections. This necessitates adjustments to both the frequency and scope of the distribution and stations testing, inspection, and maintenance programs. To improve data accuracy, Hydro Ottawa will implement advanced inspection technologies, including drone inspections for overhead assets, enabling targeted maintenance and improved asset health assessments. For underground assets, advanced techniques like Very Low Frequency Tan-Delta, Partial Discharge, and Time Domain Reflectometry will identify vulnerabilities and optimize investments. Cost-effective refurbishment, such as cable accessory replacement, will extend underground asset life. Hydro Ottawa's asset renewal strategy does not prioritize replacing assets that have reached or exceeded their typical useful life (TUL). As such, an increase in the frequency of inspections of assets that have reached TUL is also proposed for certain assets. Details of Hydro Ottawa Operations & Maintenance plans are provided in Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs.

In addition to its distribution assets, Hydro Ottawa relies on a diverse fleet of 237[13] vehicles and 44 other units of transportation equipment to support its operations, maintenance and administration (OM&A) and capital work programs. The vehicles and equipment are essential for providing efficient and reliable customer service including timely power restoration, efficient distribution system construction and maintenance, and ensuring worker and public safety. Of the 281 vehicles and equipment, 154 (55%) will be at or beyond their replacement criteria age in the 2026-2030 rate period. More details on the Fleet strategy and capital investment plan can be found in Section 3.4.5 of Schedule 2-5-4 - Asset Management Process and Section 11 of Schedule 2-5-9 - General Plant Investments.

2026-2030 Capital Expenditure Overview

Recognizing the importance of maintaining a reliable and safe electricity network, Hydro Ottawa prioritizes Renewing Deteriorating Infrastructure. This involves dedicating a substantial portion

[13] As of September 30, 2024

of the capital investment plan to the System Renewal category, which focuses on replacing deteriorating assets and upgrading critical infrastructure components. Key programs within this category include Stations and Buildings Infrastructure Renewal to replace deteriorating station assets, UG Distribution Assets Renewal to address deteriorating underground assets, OH Distribution Assets Renewal to renew deteriorating overhead infrastructure, Metering Renewal to modernize metering infrastructure, and Corrective Renewal to enable rapid response to unexpected failures. The capital investment plan for Fleet is included under the General Plant investment category.

2.3.3. Grid Modernization - Enabling the Energy Transition

Focusing on modernizing the grid through strategic technology adoption and infrastructure upgrades to enable the energy transition, facilitate customer participation, and optimize DER integration, thereby enhancing grid capabilities and efficiency.

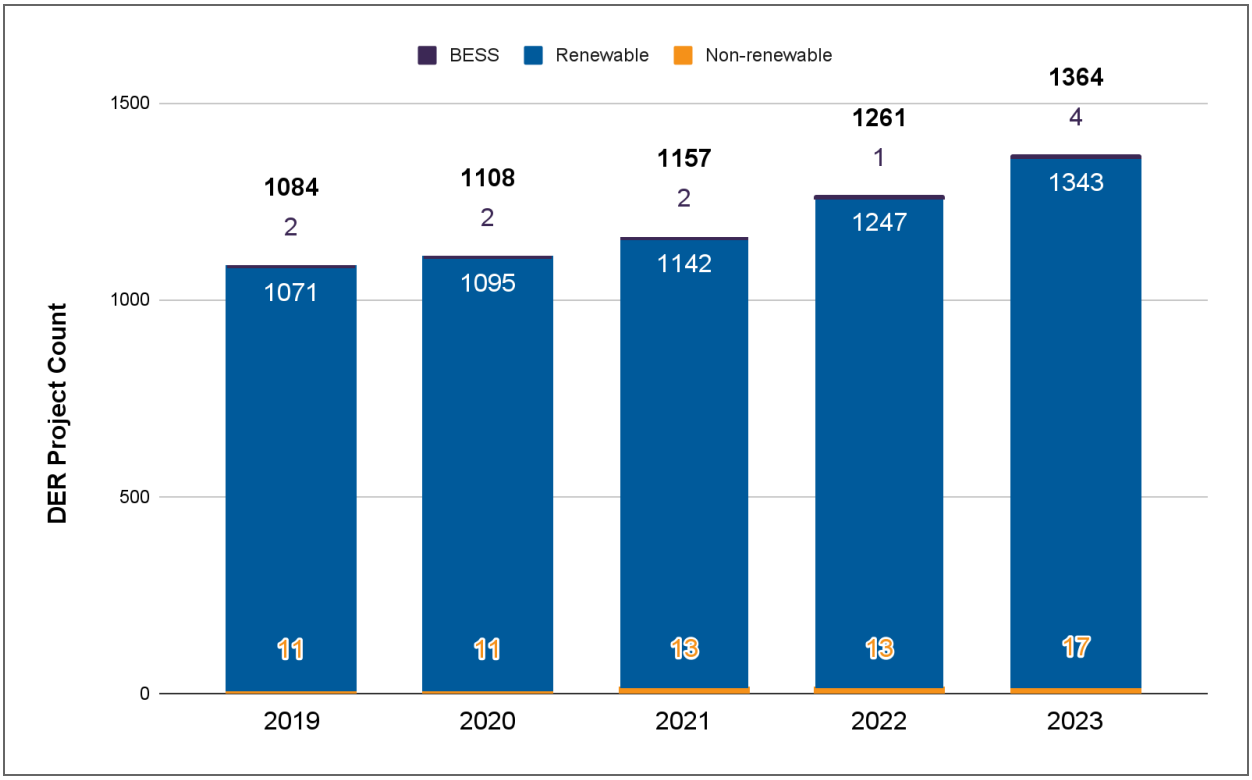
Hydro Ottawa is committed to enabling the energy transition by modernizing the grid to facilitate customer participation, enable widespread electrification, and optimize the penetration and integration of DERs.

Market forces, regulatory drivers, and funding opportunities are converging to create a compelling case for grid modernization to enable the energy transition. This need is underscored by Ontario's own energy policies, such as the recently released *Ontario's Affordable Energy Future: The Pressing Case for More Power,*[14] which explicitly identifies the need to modernize distribution grids to facilitate active monitoring of systems, build better resilience, and provide customers the energy and services they will need into the future.

Customer demand for DERs within Hydro Ottawa's territory is increasing. Electricity Canada engaged Innovative Research Group Inc. to conduct a national Behind the Meter (BTM) Survey in 2021 to explore Canadian attitudes towards new technologies designed to help consumers better manage their energy use and enable the energy transition. The survey showed that 14% of respondents already had, or would actively take steps to acquire solar panels. Please refer to Attachment 1-4-1(F) - Behind the Meter Survey. To illustrate, from 2019 to 2023, the number of connected DERs on Hydro Ottawa's grid increased by over 25% as per Figure 12. See Schedule 2-5-4 - Asset Management Process for more details.

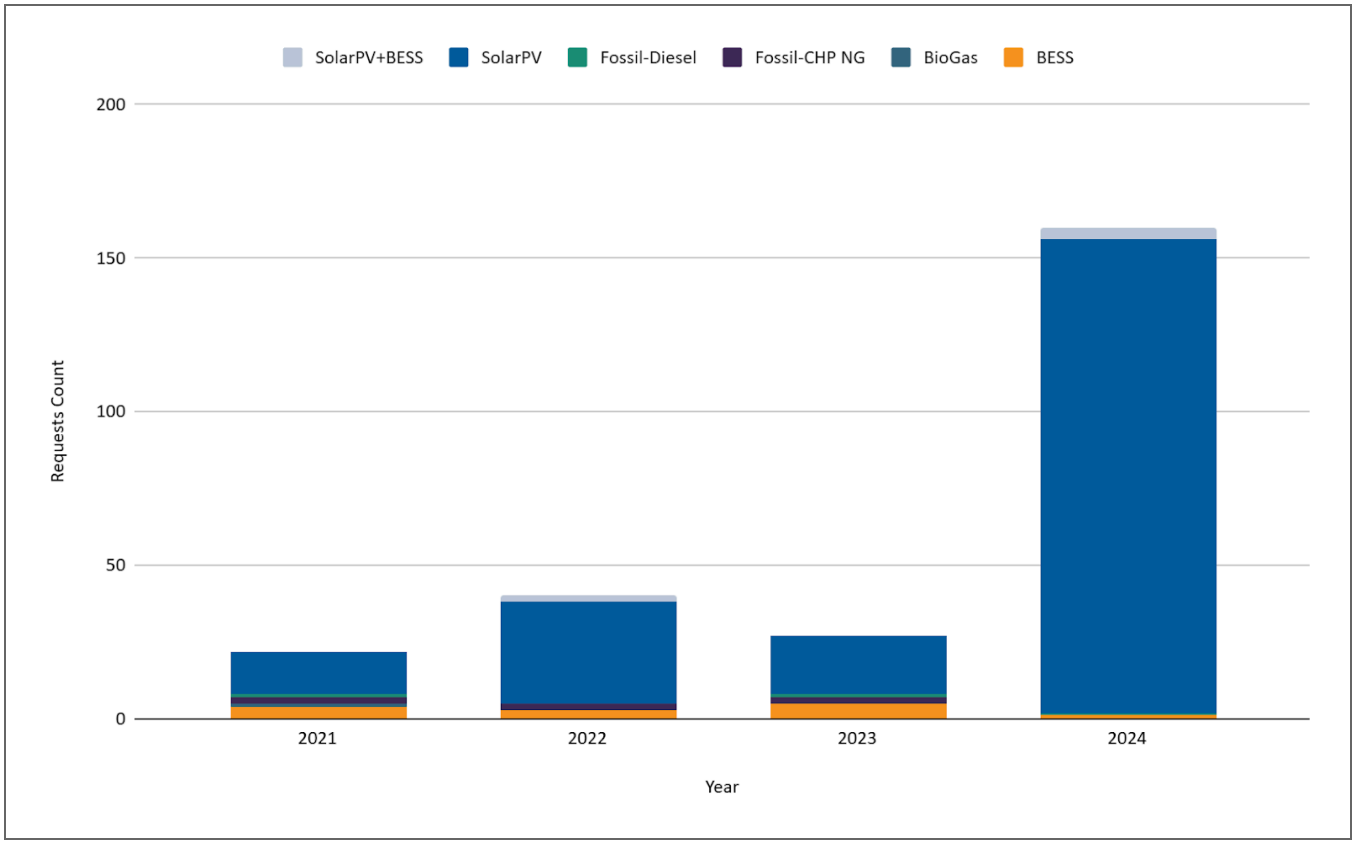
[14] Ministry of Energy and Electrification, *Ontario's Affordable Energy Future: The Pressing Case for More Power*, https://www.ontario.ca/page/ontarios-affordable-energy-future-pressing-case-more-power

Figure 12 - Total System Generator Count 2019-2023



Hydro Ottawa has seen a steady rise in preliminary connection impact assessment requests for DERs, alongside the growing number of annual DER connections. This is particularly evident in 2024, with a significant surge in requests attributed to the IESO's Ottawa DER Large Solar PV Funding Incentive program launched in January 2024, see Figure 13. The program's expansion to province-wide customers in January 2025 suggests that this trend will likely persist, although not all inquiries result in actual projects. These incentive programs are clearly stimulating public interest and participation in DER.

Figure 13 - DER Annual Requests Count 2021-2024



This surge, coupled with customer expectations for enhanced reliability during extreme weather events and a growing interest amongst customers to store energy for their own use and potentially for system benefit, necessitates a more flexible and responsive grid. As outlined in Schedule 1-4-2 - Customer Engagement on the 2026-2030 Application, a majority of customers surveyed across all customer classes support Hydro Ottawa's proposed investment plan, citing the need for the utility to prepare its grid for the future.

"Ontario's Affordable Energy Future: The Pressing Case for More Power"[15] and the 2024 Minister of Energy and Electrification's Letter of Direction to the OEB[16] emphasize the critical role of grid modernization in achieving Ontario's energy goals. This includes meeting growing electricity demand, integrating renewable energy, and enabling the energy transition by advancing NWSs, customer enabled solutions, and future utility business models. The OEB, which is also prioritizing grid modernization in its strategic planning,[17] has streamlined DER connection processes, and is encouraging innovation through its regulatory frameworks and Innovation Sandbox. Although policy and regulatory frameworks must continue to adapt to support customer choice, address barriers to DER adoption, and optimize the use of DERs to meet energy demands, the grid modernization investments Hydro Ottawa is implementing are crucial for facilitating this transition to a more distributed grid.

Further bolstering these efforts, Natural Resources Canada (NRCan) has provided substantial financial support to the utility sector through programs like the Smart Renewables and Electrification Pathways Program and the Energy Innovation Program's Smart Grid Call. This confluence of customer needs, provincial policy alignment, OEB regulatory support, and Federal funding creates a clear and compelling market signal supporting strategic investments in grid modernization for a sustainable energy future. By responding to these drivers, Hydro Ottawa is proactively building a grid that can meet the evolving needs of its customers, support the energy transition, and contribute to a more reliable and resilient electricity system.

To achieve this objective, Hydro Ottawa is focusing on:

- **Amplifying Grid Observability:** Increasing visibility and understanding of the grid's operational status, including constraints, to enhance operational decision making and to inform targeted system upgrades. Hydro Ottawa will achieve this by investing in AMI 2.0, advanced sensors, monitoring systems, and data analytics.

[15] https://www.ontario.ca/page/ontarios-affordable-energy-future-pressing-case-more-power
[16] Ministry of Energy and Electrification, *Letter of Direction to the OEB* (December 19, 2024).
[17] OEB, *Strategic Plan 2021/22 - 2025/26* (April 30, 2021).

- **Improving Grid Controllability:** Improved grid controllability will focus on increasing the level of control Hydro Ottawa has over the grid. This will allow for more dynamic operation, facilitating optimized performance and improving reliability and resilience through redundancy. These capabilities will be unlocked by investing in remotely operable control devices, advanced control systems, and observability enhancements.
- **Meeting Electrification Capacity Needs:** Hydro Ottawa has integrated electrification demand projections into its investment planning framework to strategically address the anticipated increase in electricity demand associated with a decarbonized future. This forward-looking approach ensures the efficient deployment of capital to ensure that grid upgrades provide the necessary foundation for growth and a sustainable electricity grid.
- **DER Enablement:** Hydro Ottawa is committed to enabling the widespread adoption and utilization of DERs by connecting customers to available financial incentives, see further details in Section 2.4.3 of Schedule 1-4-1 - Customer Engagement Ongoing, fostering collaborative partnerships, and implementing strategic programs. This increased integration of DERs, NWSs combined with advancements in grid observability and controllability, will allow Hydro Ottawa to accommodate two-way flow of electricity generated by these sources and leverage DERs and other controllable devices to reduce peak load and integrate local renewable energy sources within its service territory, enhancing operational flexibility.

Through strategic investments in grid modernization, Hydro Ottawa is building a foundation for a more sustainable and resilient energy future. This will enable greater customer participation, support the widespread adoption of electric vehicles and other technologies, and facilitate the integration of DERs.

2026-2030 Capital Expenditure Overview

Grid Modernization is a key focus of Hydro Ottawa's investment plan, with initiatives spread across multiple categories. These initiatives aim to leverage technologies and enhance grid capabilities to enable DER connections, improve efficiency, reliability, and resilience. This includes Capacity Upgrades to increase capacity through various means, including NWSs,

Distribution Enhancements to improve system observability through initiatives like advanced grid monitoring, Grid Technology to enable enhanced monitoring and control, cyber security and IT Infrastructure to strengthen IT systems and protect against cyber threats, and Data and System Integrations to consolidate data systems and improve decision-making.

2.3.4. Enhancing Resilience

Focusing on enhancing grid resilience by proactively upgrading infrastructure and implementing measures to protect against increasingly frequent and intense severe weather events and cyber threats.

Performing restoration work in the Pineglen neighbourhood post May 2022 Derecho

Extreme Weather

As noted in Hydro Ottawa's Customer Engagement survey, which can be found in Schedule 1-4-2 - Customer Engagement on the 2026-2030 Application, Ottawa has become the weather-alert capital of Canada.[18] Extreme weather events such as high heat, high winds, flooding and ice storms are increasingly straining and damaging the electricity grid.

[18] Environment and Climate Change Canada

The City of Ottawa, in partnership with the National Capital Commission and Environment and Climate Change Canada developed climate projections for the National Capital Region which were published within *"The Climate Change Vulnerability & Risk Assessment"*[19]. The report states:

> "People are feeling the impacts of climate change globally and locally. Research predicts these impacts will intensify and affect the National Capital Region for decades to come. As such, the region will experience more extreme weather events like floods, wildfires, droughts, heatwaves, freeze-thaw spells and tornadoes."

The OEB is also addressing climate-related challenges by focusing on enhancing distribution sector resilience, responsiveness, and cost efficiency. Following the Minister of Energy's 2022 Letter of Direction, the OEB released a report on June 29, 2023, outlining actions to mitigate vulnerabilities to severe weather events. The OEB is now implementing these recommendations and pursuing policy consultations, including the Distribution Sector Resilience, Responsiveness & Cost Efficiency (EB-2023-0003), which has led to further work in the Reliability and Power Quality Review (EB-2021-0307) and the Vulnerability Assessment & System Hardening Project (EB-2024-0199).

[19] National Capital Commission, Climate Change Vulnerability & Risk Assessment (June 2022), page i.

City of Ottawa Climate Resiliency - What will Ottawa's climate look like in the future?[20]

Hydro Ottawa has experienced firsthand the impact of these events, with a series of severe storms in recent years causing significant damage and disruption to the electricity grid.

[20] City of Ottawa, "Climate Resiliency," https://ottawa.ca/en/climate-resiliency

The effects of the May 2022 Derecho on Hydro Ottawa equipment

Recent events, as detailed in Table 4 below, include:

- 2017: Freezing rain, heavy snow, flooding, and a severe thunderstorm which impacted thousands of customers.
- 2018: Tornadoes, freezing rain, and high winds caused widespread outages, impacting over 200,000 customers.
- 2019: A flash storm, flooding, lightning strikes, and high winds which caused repeated disruptions throughout the year.
- 2021: Lightning strikes caused further outages.

- 2022: The devastating Derecho, with record-breaking wind speeds, which impacted over 180,000 customers and became the 6th costliest natural disaster in Canada's history. This was followed by a bomb cyclone in December, causing further outages.
- 2023: Tornadoes, an ice storm, freezing rain, and multiple lightning strikes continued the trend of severe weather impacts.

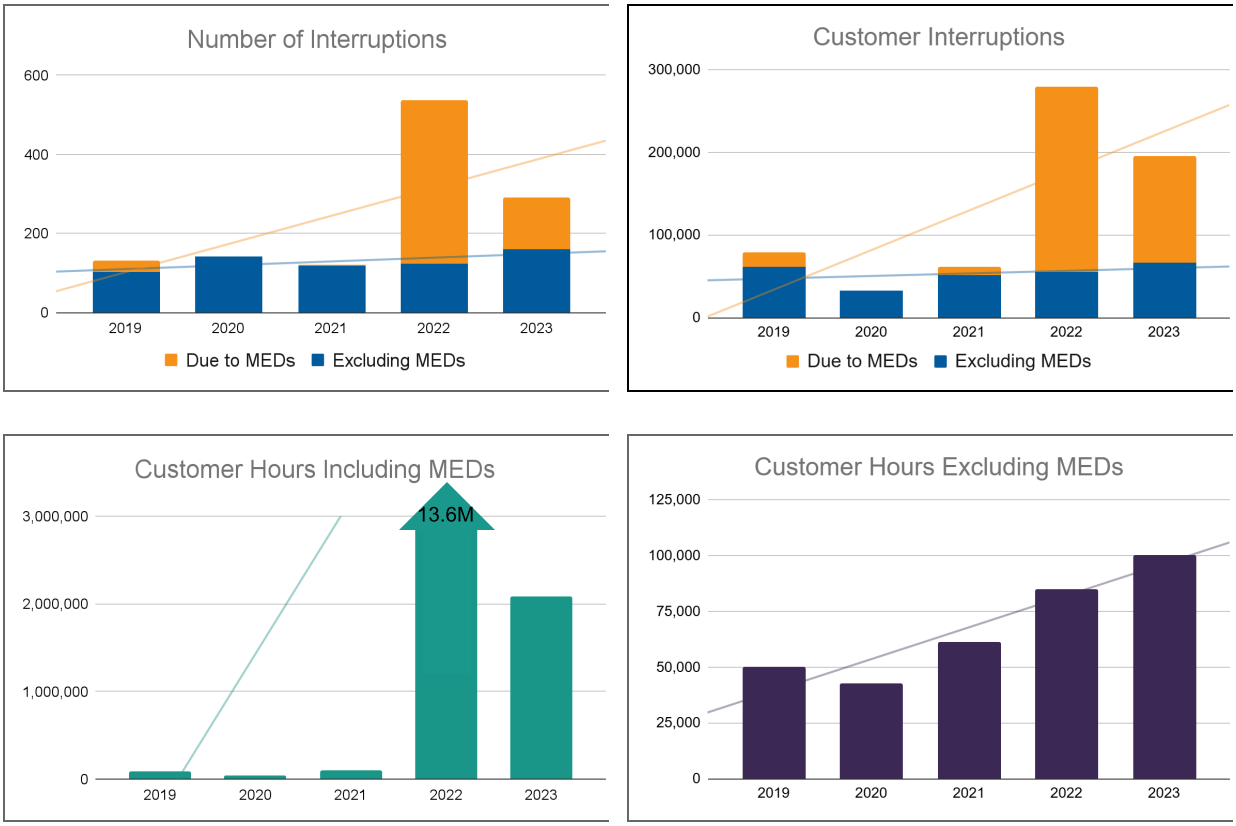
Downed poles after the May 2022 Derecho

Table 4 - Historical Weather Events & Impacts

Year	Severe Weather Event	Description & Impacts
2017	Freezing rain & heavy snow (January)	• 19,130 customers (6% of customer base)
	Flooding (May)	• 1-in-100-year flood levels for Ottawa River
	Thunderstorm (September)	• 11,391 customers (3% of customer base)
2018	Freezing rain (April)	• 55,101 customers (17% of customer base)
	High winds (May)	• 63,869 customers (19% of customer base)
	Tornadoes (September)	• 216,000 customers (65% of customer base) • Class EF-2 and EF-3 tornadoes; 260 km/h winds • 90% of customers restored within 2.5 days
2019	Flash storm (April)	• 44,511 customers (13% of customer base) • Loss of supply and substation flooding
	Flooding (May)	• 1-in-1000-year flood • Highest water levels on record for Ottawa River
	Lightning (July)	• 70,069 customers (21% of customer base) • Four separate loss of supply outages
	High winds (November)	• 14,228 customers (4% of customer base)
2021	Lightning (June)	• 17,441 customers (5% of customer base) • Lightning and loss of supply
2022	Derecho (May)	• 180,946 customers (52% of customer base) • Highest wind speeds on record in Ottawa & Ontario • Severity of wind speeds greatly exceeded forecast • 6th costliest natural disaster in Canada's history • $24M in restoration costs for Hydro Ottawa • 90% of customers restored within seven days
	Bomb cyclone (December)	• 67,710 customers (19% of customer base) • Intense freezing rain and snow; loss of supply
2023	Ice storm and freezing rain (April)	• 163,448 customers (45% of customer base) • 90% of customers restored within two days
	Lightning (June)	• 15,413 customers (4.25% of customer base) • Loss of supply
	Tornados, lightning, hail and wind (July)	• 37,821 customers (10.4% of customer base) • >6,000 total lightning strikes during month of July 2023 (8 times as many as July 2022)

These events have contributed to increased spending on emergency asset replacement and have significantly impacted the system reliability performance, see Figure 14, underscoring the need for proactive investment in grid resilience.

Figure 14 - Weather Related Reliability Impact



To combat the growing risks associated with major events, Hydro Ottawa is focusing on proactive measures such as strategic undergrounding of overhead lines, increasing tree trimming, strengthening the grid through infrastructure upgrades, and hardening assets. These measures are aimed at reducing the likelihood of storm damage, thereby enhancing resilience against extreme weather events.

Cyber security

In response to the rising threat of cybercrime impacting Canadian organizations, and the strategic importance of Ottawa as a G7 capital, Hydro Ottawa maintains a strong focus on strengthening cyber security protections and controls for its essential assets and networks. Moreover, cybercrime is on the rise across Canada. As the capital city of a G7 country which is a high-value target for malicious actors, investing in grid resilience is essential to protect the community's electrical system from the increasing frequency and intensity of cyber threats. This focus is essential to prevent compromises that could impact reliability and put customers at risk. As is highlighted in the National Cyber Threat Assessment 2025-2026 (NCTA) published by the Canadian Centre for Cyber Security, Ransomware is the top cybercrime threat facing Canada's critical infrastructure, including the energy sector[21]. From 2021-2024, Ransomware incidents saw a 26% year-over-year growth with predictions of this to continue to trend upwards.[22] Statista's Market Insight also predicts that from 2024 to 2028, the global cost of cybercrime will rise from $9.22 trillion to $13.82 trillion[23]. The NTCA also emphasizes threats from nation states as geopolitical events will continue to impact critical infrastructure as well as the continued rise of an expanded attack surface that will exponentially grow as more connected devices are brought online and require access to the OT infrastructure. This further enforces the need for a holistic cyber security approach towards key investment priorities such as Grid Modernization and Grid Resilience.

These areas of focus align with industry standards and regulatory requirements for grid resilience, including compliance with the OEB's Vulnerability and System Hardening requirements. Hydro Ottawa is also actively implementing measures outlined as in Attachment 2-5-4(B) - Addendum Report to Distribution System Climate Vulnerability Risk Assessment and Climate Change Adaptation Plan and Attachment 2-5-4 (E) - Resilience Investment Business Case Report to enhance resilience against future extreme weather events.

[21] Canadian Centre for Cyber Security, "National Cyber Threat Assessment 2025-2026," https://www.cyber.gc.ca/sites/default/files/national-cyber-threat-assessment-2025-2026-e.pdf
[22] *Ibid*
[23] Statista, "Cybercrime Expected To Skyrocket in Coming Years" (February 22, 2024)

By focusing on grid resilience, Hydro Ottawa is taking proactive steps to protect its customers and ensure a reliable and resilient electricity supply for the future, despite the growing challenges posed by a changing climate and increasing cyber threats.

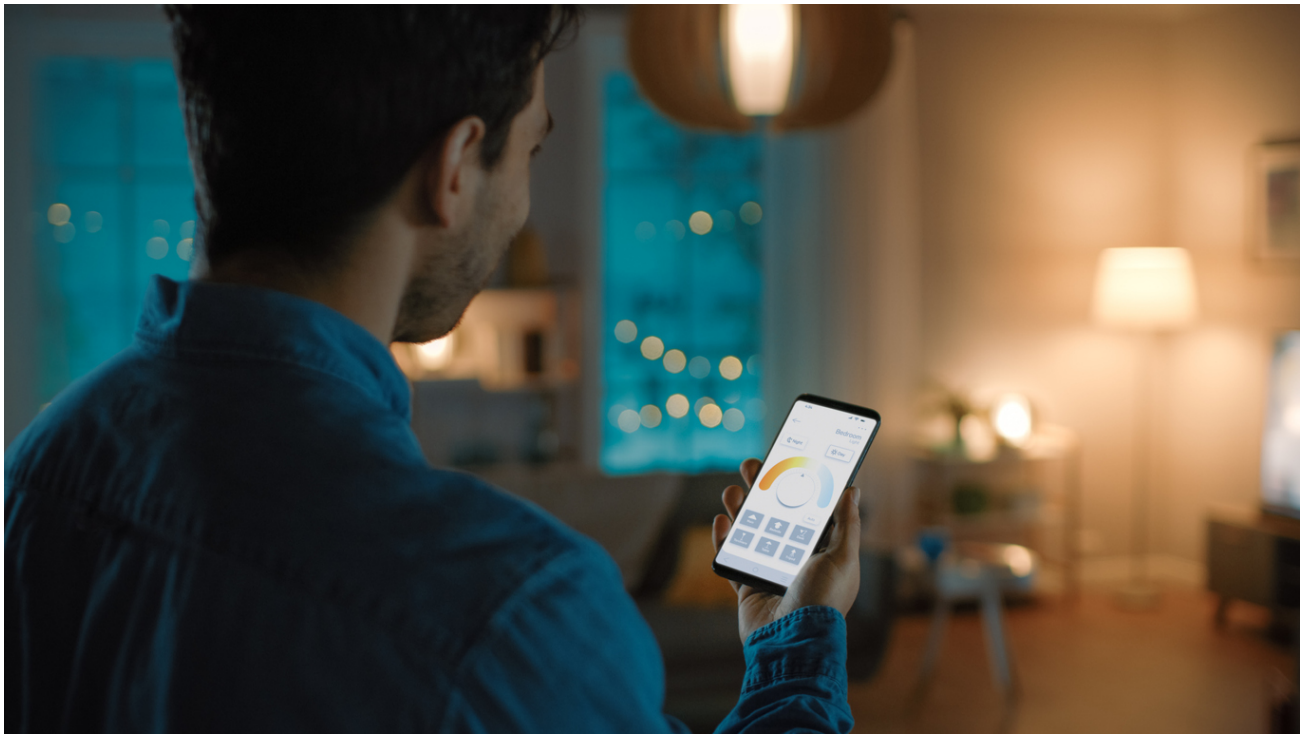
2026-2030 Capital Expenditure Overview

Grid Resilience is a priority embedded throughout Hydro Ottawa's investment plan. Initiatives focus on strengthening the grid against various threats, including extreme weather events, equipment failures, and cyberattacks. This is achieved through System Renewal to replace deteriorating infrastructure and improve reliability, Distribution Enhancements to implement initiatives like strategic undergrounding of overhead lines and storm hardening initiatives, control and optimization to improve grid flexibility through advanced monitoring and control capabilities, cyber security and IT Infrastructure to enhance IT security measures, and Grid Technology to focus on improving resilience to extreme weather events and integrating new technologies.

2.3.5. Focus Areas

Hydro Ottawa's investment planning for the 2026-2030 period is fundamentally anchored in two critical focus areas: ensuring customer affordability amidst economic uncertainties, and investing in a robust and skilled workforce to navigate the rapidly evolving energy landscape. These dual priorities are essential for maintaining service reliability and facilitating the necessary infrastructure upgrades and grid modernization, all while mitigating the impact on customer rates.

Managing Rising Costs



Focusing on managing rising costs to maintain affordability for customers while ensuring a reliable and resilient electricity system to meet growing demand.

Hydro Ottawa is operating within a complex landscape characterized by heightened customer sensitivity to electricity costs, persistent inflationary pressures, elevated interest rates, and an increasing reliance on an uninterrupted power supply. The period from 2021 to 2025 was particularly challenging for Hydro Ottawa, marked by the COVID-19 pandemic, the highest inflation in 40 years, a weakened Canadian dollar, supply chain disruptions, and extreme weather events, including the devastating May 2022 Derecho storm. These compounding factors placed considerable financial strain on the company, yet it prioritized customer affordability by forgoing a Z-factor application which would have allowed Hydro Ottawa to recover approximately $8.7M in OM&A costs and depreciation up to the end of 2025 associated

with $15.1M in Derecho capital additions. This decision reflected a commitment to supporting customers during difficult times.

Furthermore, Hydro Ottawa strategically managed its capital expenditures by deferring planned projects, resulting in a $44.2M budget adjustment. Please refer to Table 4 in Section 4.1.2 of Schedule 2-5-5 - Capital Expenditure Plan for additional information. This proactive approach mitigated further financial variances and demonstrated a commitment to responsible fiscal management despite these challenging circumstances. To achieve this outcome, Hydro Ottawa relied heavily upon its robust asset management framework for decisions around investment priorities. The company's strong project and program oversight, alongside stringent budgetary controls refined during the 2021-2025 period, will continue to guide the company in mitigating rising costs and optimizing capital expenditures throughout the next rate period. Furthermore, the operational efficiencies achieved through targeted process improvements and digital transformation will be systematically maintained, ensuring sustained service reliability and cost-effectiveness for customers. Please refer to Schedule 1-3-4 - Facilitating Innovation and Continuous Improvement, for details on these efficiencies and improvements.

Looking ahead to the 2026-2030 period, Hydro Ottawa faces continued economic uncertainties, including high inflation and the general tariff related uncertainty, and must address the urgent need to renew deteriorating infrastructure, modernize the grid, and add significant capacity due to increased growth and electrification and ensure the resilience of the system. To address these challenges while maintaining customer affordability, Hydro Ottawa has implemented a comprehensive cost management strategy that includes:

- **Advanced Asset Management:** Implementing an Enterprise Asset Management (EAM) system to further optimize investment prioritization through integrations with Predictive Analytics and to optimize maintenance schedules through Condition-Based Monitoring.
- **Proactive Risk Management:** Implementing strategies to minimize project delays and disruptions.

- **Benchmarking:** Conducting comparative analysis to identify improvement opportunities.
- **Continuous Improvement and Innovation:** Modernizing the grid and operations by leveraging digital tools and automation.
- **Digital Transformation:** Enhancing service delivery through technology.
- **Infrastructure Efficiencies:** Optimizing asset utilization and leveraging NWSs.
- **Process Improvements:** Investing in workforce development and operational effectiveness.

Hydro Ottawa is also actively considering the impact on costs and affordability by increasing System O&M programs with more frequent inspections, testing, and maintenance to mitigate the risk associated with the deferral of near-term capital investments.

Hydro Ottawa's planning is rooted in a thorough analysis of the risks posed by deteriorating infrastructure, increasing electricity demand, and the imperative for grid modernization and resilience. Recognizing the critical importance of aligning with customer priorities, the utility proactively sought feedback through a comprehensive engagement survey. The survey confirmed that, even with a clear understanding of the associated bill impacts, customers overwhelmingly support the proposed plan for essential grid investments and infrastructure renewal as outlined in Section 2.2 - Customer Priorities. This valuable insight directly informs our investment decisions, reinforcing our commitment to balancing necessary upgrades with affordability. Cost control and efficiency remain paramount, with a focus on continuous improvement across all operations and capital projects. To minimize rate impacts, Hydro Ottawa will carefully prioritize and phase investments, addressing the most critical system risks first. This approach ensures that all decisions are guided by cost consciousness, customer value, and the long-term reliability of our electrical system.

Investing in the Workforce

Focusing on workforce development and safety to ensure a skilled and secure energy future.

While maintaining a relatively stable headcount over the past two rate periods, Hydro Ottawa now faces a confluence of escalating operational demands, rapid technological advancements, and the intensifying impacts of climate change, necessitating a strategic and significant investment in its workforce. This investment is not merely a reactive measure to address immediate pressures, but a proactive and crucial step to ensure long-term resilience, maintain service reliability, and effectively navigate the complex and evolving energy landscape. The need for specialized skills, expanded capacity, and enhanced responsiveness is paramount to meet the growing demands of the customer base and to safeguard the critical infrastructure upon which the community depends.

Hydro Ottawa recognizes that investments in both assets and a skilled workforce are paramount. While investments in infrastructure and maintenance are critical, the company acknowledges that during challenging times – such as storms, pandemics, and labour disruptions – it is the dedication and expertise of its workforce that is essential to maintain reliable service and ensure the continued provision of electricity to its customers. The challenges of recent years have underscored the critical importance of a well-resourced and resilient workforce. Hydro Ottawa has faced an unprecedented series of challenges, including:

- A near-strike in 2021 and an 84-day strike in 2023, which disrupted operations and highlighted the need for robust contingency planning and workforce stability. These disruptions also reflected, among other factors, underlying staffing concerns.
- Increasingly frequent and severe weather events, with storm after storm demonstrating the vulnerability of the electricity grid and the essential role of skilled personnel in rapid restoration efforts.
- Deteriorating infrastructure and evolving customer energy demands are driving the need for grid modernization, enhanced resilience, and the integration of new technologies.

In addition to the aforementioned, in 2021-2023, Hydro Ottawa experienced an unforecasted surge in customer-driven growth projects, encompassing unforeseen large-scale developments and a residential subdivision boom. This growth significantly amplified the demand for technical and trade staff. Concurrently, engineering resources faced escalating pressure due to the rising complexity and volume of large load and Distributed Energy Resource (DER) connection requests, requiring specialized engineering expertise. Moreover, the implementation of the Advanced Distribution Management System (ADMS) and the broader Grid Modernization Strategy highlighted the need for new engineering roles to manage advanced technologies. Finally, the need for enhanced oversight of larger, more complex projects, combined with a less tenured workforce, strained Hydro Ottawa's leadership and data analytics capabilities. In

response to these immediate and escalating pressures, Hydro Ottawa could not defer action and added 50 new positions to its workforce in 2024.

Looking ahead to 2026-2030, in order to support the proposed capital and OM&A program investments, and to navigate the rapidly evolving utility landscape driven by grid modernization and the energy transition, Hydro Ottawa must continue to strategically expand its workforce. To determine headcount needs for its direct-labour workforce, Hydro Ottawa's employed a robust, data-driven workforce planning model, ensuring staffing levels are strategically aligned with operational needs and objectives. This model, detailed in Attachment 4-1-3(B) - Workforce Planning Strategy, systematically analyzes current and projected workloads, including capital project volumes, maintenance requirements, and customer growth, to identify required skills and competencies. By assessing the existing workforce and identifying gaps, the model facilitates the development of targeted hiring, training, and development initiatives. This comprehensive approach ensures that workforce needs are addressed proactively, rather than reactively.

For workforce needs not directly attributed to the capital and OM&A projects, Hydro Ottawa took the approach of engaging senior leadership to assess current and future skill requirements, particularly in emerging technological areas. All identified needs were then consolidated, rigorously reviewed, and challenged by executive management. This systematic approach ensures that workforce needs are not addressed in an ad hoc manner, but rather through a comprehensive and data-driven process. The combination of these assessments resulted in a proposed staffing plan that includes the addition of 127 new headcount over the 2026-2030 period. The increased headcount is primarily driven by the following key factors:

Significant Capital Program Growth: A near doubling of capital investment necessitates a substantial increase in skilled trades and technical staff to execute projects related to growth and electrification, infrastructure renewal, grid modernization, and resilience. This includes additional workforce to substantiate substation construction, battery energy storage system installations, and the replacement of deteriorating assets.

Increased Complexity and Volume of Projects: The rising complexity of projects, especially those involving grid modernization and the integration of Distributed Energy Resources (DERs), demands specialized engineering and technical expertise. This includes roles focused on new technologies, standards development, and advanced grid operations.

Deteriorating Infrastructure and Enhanced Maintenance: The need to renew deteriorating infrastructure and implement enhanced testing, inspection, and maintenance programs requires additional resources, particularly in skilled trades and technical positions.

Enhanced Oversight and Support Functions: The growth in project volume and workforce size requires strengthening support functions such as system operations, contractor management, project execution planning, and leadership to ensure efficient and safe operations.

Technological Advancement and Digital Transformation: The increasing complexity of IT and OT systems, cyber security needs, and digital customer experience enhancements drive the demand for specialized IT expertise.

Increased Regulatory and Compliance Demands: Growing safety training, business continuity, sustainability initiatives, and complex regulatory requirements necessitate dedicated compliance and policy resources.

Strengthening Internal Support Structures: Increased recruitment, HR technology evolution, and complex financial reporting drive the need for expanded HR and finance support.

As highlighted in Schedule 4-1-3 - Workforce Staffing and Compensation, the percentage of work being completed by external contractors has remained relatively stable at 44-46% of total gross capital expenditures, from 2021-2025 through to the 2026-2030 projections. This consistency indicates that Hydro Ottawa is effectively managing its contractor usage while

prioritizing the addition of permanent staff to address both immediate and long-term needs. It is anticipated that this increased staffing will be necessary not only for the next few rate cycles, but also in the decades beyond, as these challenges are expected to persist and evolve.

3. CAPITAL EXPENDITURE PLAN

Hydro Ottawa is embarking on a period of transformative growth, with a proposed capital expenditure plan for 2026-2030 that nearly doubles the investment of the previous five years. This plan prioritizes system capacity enhancements, the renewal of deteriorating infrastructure, grid modernization, and bolstering overall resilience. Please refer to Table 5 for details on the historical Capital Expenditure Plan and Table 6 for details of the 2026-2030 proposed Capital Expenditure plan. Refer to Schedule 2-5-5 - Capital Expenditure Plan for further details on the historical and planned capital expenditures. The $102.8M variance between Hydro Ottawa's expected net capital expenditures and the OEB-Approved amounts is explained in Section 4 of Schedule 2-5-5 - Capital Expenditure Plan.

Table 5 - Capital Expenditure Historical Year Summary ($'000 000s)

Investment Category	Historical Years			Bridge Years		Total
	2021	2022	2023	2024	2025	2021-2025
System Access	$ 48	$ 47	$ 53	$ 69	$ 76	$ 293
System Renewal	$ 43	$ 65	$ 40	$ 42	$ 41	$ 232
System Service	$ 24	$ 14	$ 17	$ 47	$ 60	$ 161
General Plant	$ 24	$ 11	$ 13	$ 15	$ 13	$ 76
TOTAL CAPITAL EXPENTIDURES	**$ 139**	**$ 138**	**$ 123**	**$ 173**	**$ 189**	**$ 762**
Capital Contributions	$ (27)	$ (28)	$ (29)	$ (37)	$ (41)	$ (162)
NET CAPITAL EXPENDITURES	**$ 112**	**$ 110**	**$ 94**	**$ 136**	**$ 148**	**$ 600**

Table 6 - Capital Expenditure Test Year Summary ($'000 000s)

Investment Category	Test Years					Total
	2026	2027	2028	2029	2030	2026-2030
System Access	$ 86	$ 79	$ 66	$ 67	$ 71	$ 369
System Renewal	$ 85	$ 83	$ 81	$ 87	$ 95	$ 432
System Service	$ 99	$ 125	$ 76	$ 86	$ 87	$ 473
General Plant	$ 38	$ 24	$ 33	$ 28	$ 11	$ 134
Total Capital Expenditures	**$ 309**	**$ 311**	**$ 256**	**$ 268**	**$ 265**	**$ 1,409**
Capital Contributions	$ (51)	$ (51)	$ (38)	$ (32)	$ (41)	$ (213)
Net Capital Expenditures	**$ 258**	**$ 260**	**$ 218**	**$ 235**	**$ 224**	**$ 1,195**

The largest variance between the 2021-2025 and 2026-2030 plans is seen in the increased investment in System Service, driven primarily by capacity upgrades. This is followed by increased investment in System Renewal, primarily for station equipment renewal. System Access also sees increased investment, driven by rising customer connections. Finally, General Plant expenditures are higher, primarily due to Connection and Cost Recovery Agreements for capacity upgrades and Fleet Replacement. The following sections provide a detailed breakdown of the changes in expenditures, summarizing the investment by category and capital program.

3.1. SYSTEM ACCESS

Spending on System Access, necessary to support growth and electrification, is expected to increase during the 2026-2030 period by 26% compared to the 2021-2025 timeframe. Projected capital investments are expected to rise from $293M in the 2021-2025 period to $369M in the 2026-2030 period, excluding Capital Contributions as shown in Table 7. This increase is primarily attributed to the growing number and complexity of customer connections, reflected in the higher expenditures for the Customer Connections and System Expansion Capital programs. This growth in expenditures is partially offset by a projected decrease in Plant

Relocation costs. See Schedule 2-5-5 - Capital Expenditure Plan and Schedule 2-5-6 - System Access Investments for further breakdown of the System Access capital investments.

Table 7 - System Access Capital Expenditure Variance by Capital Program 2021-2025 DSP vs. 2026-2030 DSP ($'000 000s)

Capital Program	Historical / Bridge Years	Test Years	Variance
	2021-2025	2026-2030	
Plant Relocation	$ 45	$ 35	$ (10)
System Expansion	$ 89	$ 108	$ 19
Customer Connections	$ 157	$ 221	$ 64
Generation Connections	$ 1	$ 4	$ 4
Metering	$ 2	$ 2	-
Total Capital Expenditures	**$ 293**	**$ 369**	**$ 77**
Capital Contributions	$ (158)	$ (196)	$ (38)
Net Capital Expenditures	**$ 134**	**$ 173**	**$ 39**

The Capital Programs encompassed within the System Access investment category are detailed below.

Plant Relocation & Upgrade

The capital investment for this program is detailed in Section 2 of Schedule 2-5-6 - System Access Investments. This program funds the relocation or upgrade of Hydro Ottawa-owned or joint-use overhead or underground equipment for third-party infrastructure projects, primarily by the City of Ottawa. This is driven by road widening and other development projects that conflict with existing Hydro Ottawa infrastructure. The program aims to meet regulations, improve system efficiency, and enable economic development. Spending from 2026-2030 is projected to decrease relative to 2021-2025, due to the completion of the City of Ottawa's Light Rail Transit

Phase II project. The 2026-2030 program is budgeted based on planned road widening projects outlined in the City of Ottawa's Transportation Master Plan[24].

System Expansion

The capital investment for this program is detailed in Section 4 of Schedule 2-5-6 - System Access Investments. System expansions are initiated when capacity constraints in Hydro Ottawa's infrastructure necessitate upgrades or additions to accommodate new customers or support existing customer service upgrades. Investments may involve upgrading feeders, transformers, or substations to ensure reliable power supply. Driven by customer service requests, particularly the growing number of large load requests, and Hydro Ottawa's legal obligation to fulfill connection requests, this program aims to ensure timely and efficient customer connections.

The System Expansion program is experiencing significant growth due to the current expansion efforts focused on major infrastructure projects such as the Hydro Road substation for OC Transpo's Zero Emission Buses, the Richmond South substation upgrade to support the DND Dwyer Hill Training Center, and feeder expansions for projects including the Ottawa Hospital's new campus, among others. These projects highlight the growing complexity and scale of distribution system expansion required to meet community energy demands.

Customer Connections

The capital investment for this program is detailed in Section 3 of Schedule 2-5-6 - System Access Investments. This program ensures new and modified customer connections, including residential subdivisions (townhomes, semi-detached, singles, or mixed), commercial developments (underground or vault equipment service), and infill services, are seamlessly integrated into the distribution grid, fulfilling mandated service obligations. The program involves

[24] City of Ottawa, "Transportation Master Plan, Exhibit 7.2: 2031 Affordable Road Network- Project By Phase- https://documents.ottawa.ca/sites/default/files/documents/tmp_en.pdf

installing transformers, lines, switchgear, and metering infrastructure, and may require roadwork and civil works.

The projected increase in this program is a direct result of sustained regional growth and development. This growth is fueled by residential subdivision expansion, commercial development aligned with transit-oriented projects and large load requests, and ongoing infill projects. Key factors to the increase include the City of Ottawa's intensification policies, the energy transition, and the rise of large-scale laboratory developments, all contributing to more complex and larger connection requests. The program focuses on meeting customer connection timelines while adhering to regulations. Two examples of budgeted large and complex commercial customer connections are the Regulatory and Security Science main project at the CFIA facility and the TerraCanada National Capital Area project at the National Research Council facilities.

Generation Connections

The capital investment for this program is detailed in Section 5 of Schedule 2-5-6 - System Access Investments. Hydro Ottawa's Generations Connections program facilitates integrating customer owned DERs into the distribution grid, complying with regulations and ensuring system reliability and safety. The program covers infrastructure upgrades and streamlined connection processes.

The increase in spending is planned to support the anticipated rise in DER adoption driven by enablement programs between 2026 and 2030 as well as the growing number of committed and planned customer generation projects. Notably, there is one large DER connection (over 500 kW) forecasted each year from 2026-2030 in support of the increasing trend of DER connections, see Figure 13 - DER Annual Requests Count 2021-2024. The IESO's DER Market Vision and Design Project[25] is expected to explore, design and implement foundational

[25] DER Market Vision and Design Project, https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Distributed-Energy-Resources-Market-Vision-and-Design-Project

participation models for DERs in Ontario's electricity market and other IESO programs, such as the Save On Energy Home Renovation Savings Program[26] and the Save On Energy Retrofit Program[27] now include incentives for DERs. All these initiatives are expected to contribute to DER growth. The projected trend of accelerated DER adoption is further detailed in Section 9.3.2 of Schedule 2-5-4 - Asset Management Process.

Metering

The capital investment for this program is detailed in Section 6 of Schedule 2-5-6 - System Access Investments. Hydro Ottawa's Metering Program invests in metering technology, including Suite Metering for multi-unit buildings. The projected investment in revenue meter installations and retrofits is consistent with historical investment levels. Hydro Ottawa anticipates no substantial alterations to customer-initiated installations of new and retrofitted suite metering.

3.2. SYSTEM RENEWAL

The System Renewal investment category allocates spending to mitigate critical system risks stemming from aging and deteriorating assets. This includes replacing assets that pose significant reliability risks, upgrading systems, and replacing obsolete equipment to maintain system reliability, enhance efficiency and resilience, and ensure the continued delivery of safe and reliable electricity service.

Projected capital investment for System Renewal is expected to increase by 86% compared to the $232M in the 2021-2025 period, vs. $432M in the 2026-2030 timeframe. The significant increase in capital investment is primarily driven by the investments in station equipment renewals, guided by Predictive Analytics-driven risk assessments and the strategic replacement of the obsolete metering fleet.

[26] Save On Energy, "Home Renovation Savings Program, "https://www.saveonenergy.ca/For-Your-Home/Home-Renovation-Savings
[27] Save On Energy,"Retrofit Program," https://saveonenergy.ca/For-Business-and-Industry/Programs-and-incentives/Retrofit-Program

The implementation of Predictive Analytics and improved asset failure curves have resulted in a more comprehensive assessment of system risk associated with the deteriorating asset condition, please refer to Section 4.4 of Schedule 2-5-4 - Asset Management Process for additional information. This has informed the need for increased investment to renew high-risk station assets, followed by underground and overhead assets. The staged renewal of the obsolete metering population is the second highest contributor to the increased investment under System Renewal. Table 8 outlines the System Renewal program expenditures by the five associated capital programs. See Schedule 2-5-5 - Capital Expenditure Plan and Schedule 2-5-7 - System Renewal Investments for further breakdown of the System Renewal capital investments.

Table 8 - System Renewal Capital Expenditure Variance by Capital Program 2021-2025 DSP vs. 2026-2030 DSP ($'000 000s)

Capital Program	Historical / Bridge Years	Test Years	Variance
	2021-2025	2026-2030	
Stations & Bldgs Infra Renewal	$ 31	$ 108	$ 76
OH Distribution Asset Renewal	$ 43	$ 68	$ 25
UG Distribution Assets Renewal	$ 63	$ 103	$ 40
Corrective Renewal	$ 83	$ 67	$ (16)
Metering Renewal	$ 12	$ 86	$ 75
Total Capital Expenditures	**$ 232**	**$ 432**	**$ 199**
Capital Contributions	-	-	-
Net Capital Expenditures	**$ 232**	**$ 432**	**$ 199**

The Capital Programs encompassed within the System Renewal investment category are detailed below.

Stations and Buildings Infrastructure Renewal

The capital investment for this program is detailed in Section 2 of Schedule 2-5-7 - System Renewal Investments. Hydro Ottawa's Station and Buildings Infrastructure Renewal Program invests in upgrading and replacing deteriorating assets for stations and station buildings to maintain system reliability and safety. These assets include station transformers, station switchgear, batteries, protection and control systems (Relays and Remote Terminal Units (RTUs)), and other minor assets such as reclosers, insulators, arresters, online monitoring equipment and station building roofs. The Stations and Buildings Infrastructure Renewal program investments are driven by asset condition and risk assessments. These assessments are conducted through the distribution asset model within Copperleaf Predictive Analytics (PA), as detailed in Section 5.1.4 of Schedule 2-5-4 - Asset Management Process.

The primary cost driver for the 2026-2030 Stations and Buildings Infrastructure Renewal program is the decommissioning of five high-risk 4kV substations through voltage conversion, undertaken to accommodate anticipated system growth. A secondary, yet significant, cost driver is the renewal of high-risk station breakers at four locations, identified through Predictive Analytics. Deteriorating substation assets within the Stations and Buildings infrastructure represent the most substantial risk to system performance. These critical assets serve a large customer base and provide essential system flexibility and backup capacity. Proactive asset replacement is therefore imperative to mitigate the elevated costs and risks associated with reactive repairs. This is particularly crucial within the 4kV system, where the radial distribution network configuration severely limits restoration capabilities in the event of substation asset failures.

OH Distribution Assets Renewal

The capital investment for this program is detailed in Section 3 of Schedule 2-5-7 - System Renewal Investments. This program focuses on the renewal of overhead distribution infrastructure, which encompasses poles, OH transformers, OH switches and OH reclosers. The investments in the Overhead Distribution Assets Renewal program are driven by asset condition

and risk assessments. These assessments are conducted through the distribution asset model within Copperleaf Predictive Analytics, as detailed in Section 5.1.4 of Schedule 2-5-4 - Asset Management Process.

The expected increase to the pole renewal cost supports the annual replacement of 395 poles, aligning with the 2021-2025 period replacement rate of 400 poles. This projection reflects the increased cost per pole observed in the previous period and incorporates system resilience improvements within the renewed design. Overhead transformer replacement costs are also included in this program.

The expected costs for OH Switch/Recloser Renewal is a direct response to the deteriorating infrastructure, which has resulted in elevated outage rates and corrective maintenance costs during the 2021-2025 period, as detailed in Section 3.3.4 of Schedule 2-5-7 - System Renewal Investments. Project scoping within the OH Switch Renewal Program will also contemplate incremental investments that enhance the observability of the system.

UG Distribution Assets Renewal

The capital investment for this program is detailed in Section 4 of Schedule 2-5-7 - System Renewal Investments. This program replaces deteriorating underground distribution assets, including cables, UG transformers, and UG switchgear, civil infrastructure and vault equipment. Investments in this area are essential for maintaining the reliability and resilience of the underground network and are driven by asset condition and risk assessments. These assessments are conducted through the distribution asset model within Copperleaf Predictive Analytics (PA), as detailed in Section 5.1.4 of Schedule 2-5-4 - Asset Management Process.

The increased capital investment within this program is primarily attributed to escalating per-unit costs associated with the cable replacement program. Despite a slight decrease in the projected cable units to be replaced compared to the previous period, significant price increases are

anticipated due to forecasted material and external service costs. The impacts of the inflationary pressures on Hydro Ottawa are detailed in Schedule 1-2-5 - Impacts of Inflationary Pressure.

Corrective Renewal

The capital investment for this program is detailed in Section 6 of Schedule 2-5-7 - System Renewal Investments. This program addresses the replacement of assets that have degraded to a point of functional failure and pose an imminent failure risk, or have been damaged by third parties. While prioritizing proactive renewal, Hydro Ottawa also recognizes the need for reactive measures to maintain system integrity and address unexpected failures.

The drastic variance in capital investment for the 2026-2030 period compared to the actual expenditures in 2021-2025 period, is primarily attributed to the unusually high number and severity of Major Event Days (MEDs) experienced in the 2021-2025 period. It is assumed that the 2021-2025 MED frequency and intensity represents an anomaly. Therefore, the 2026-2030 forecast is more accurate compared to the 2021-2025 OEB-Approved amount.

A net increase in spending is observed in the 2026-2030 budget relative to the 2021-2025 OEB-Approved budget, due to cost escalations and the increasing impact of climate change on the electrical distribution system. While a discrete event of the magnitude of the 2022 Derecho is not explicitly forecast, the growing frequency and intensity of severe weather events necessitate sustained and strategic investment in infrastructure resilience. This imperative is reflected in the 2026-2030 forecasted capital investment in this program.

Metering Renewal

The capital investment for this program is detailed in Section 5 of Schedule 2-5-7 - System Renewal Investments. This program involves upgrading and replacing functionally obsolete metering infrastructure to support advanced metering functionality and improve system monitoring capabilities. The increase in spending in this category as compared to the previous

period is to begin upgrading the metering fleet to Advanced Metering Infrastructure (AMI) 2.0 meters.

Hydro Ottawa's AMI 2.0 Metering Renewal Project aims to replace end-of-life meters with technology to empower customers with data-driven insights and tools for greater engagement and control over their energy usage. This initiative aligns to grid modernization objectives by facilitating improved grid visibility and interoperability, which is a key to enhancing reliability and efficiency. The project encompasses the replacement of existing meters, upgrades to the head-end system and data management platform, and potential deployment of complementary grid-edge devices. Phased over 2026-2035, the project begins with comprehensive planning and vendor selection, emphasizing open standards and interoperability. Rigorous testing and cyber security measures will ensure a smooth transition. Deployment will be phased, integrating with existing systems and prioritizing staff training. Ongoing evaluation will identify optimization opportunities, maximizing the system's benefits while ensuring cost-effectiveness. Risk mitigation strategies addressing reliability, safety, financial, environmental, and compliance concerns will be implemented throughout the project.

3.3. SYSTEM SERVICE

The System Service investment category allocates spending to increase capacity of the distribution system to meet forecasted demand, improve system reliability and resilience, and increase grid modernization in the distribution system.

Spending under this investment category is escalating by 194% from $161M in the 2021-2025 period to $473M in the 2026-2030 timeframe. The increase is primarily driven by the Capacity Upgrades program, which addresses growing capacity needs due to customer growth and electrification. Increased spending in the Distribution Enhancements program also contributes, with a focus on two new budget programs for Distribution System Observability and Distribution System Resilience. Finally, the Field Area Network Program drives further increases with investments in fiber extensions and wireless communication, as detailed in Table 9. See

Schedule 2-5-5 - Capital Expenditure Plan and Schedule 2-5-8 - System Service Investments for further breakdown of the System Service capital investments.

Table 9 - System Service Capital Expenditure Variance by Capital Program 2021-2025 DSP vs. 2026-2030 DSP ($'000 000s)

Capital Program	Historical / Bridge Years	Test Years	Variance
	2021-2025	2026-2030	
Capacity Upgrades	$ 108	$ 347	$ 239
Stations Enhancements	$ 3	$ 3	$ 0
Distribution Enhancements	$ 28	$ 93	$ 65
Grid Technologies	$ 21	$ 6	$ (14)
Control and Optimization	-	$ 4	$ 4
Field Area Network	$ 2	$ 21	$ 19
Total Capital Expenditures	**$ 161**	**$ 473**	**$ 312**
Capital Contributions	-	$ (4)	$ (4)
Net Capital Expenditures	**$ 161**	**$ 469**	**$ 308**

The Capital Programs encompassed within the System Service investment category are detailed below.

Capacity Upgrades

The capital investment for this program is detailed in Section 2 of Schedule 2-5-8 - System Service Investments. The capacity upgrades program addresses system capacity needs through station capacity, distribution capacity and non-wire capacity upgrades. System capacity needs and required upgrades are determined through the System Capacity Assessment as outlined in Section 9 of Schedule 2-5-4 - Asset Management Process and Integrated Regional Resource Planning as detailed in Section 4 of Schedule 2-5-2 - Coordinated Planning with Third Parties.

Station capacity upgrades, designed to meet forecasted demand, focus on expanding existing Hydro Ottawa substations or the construction of new facilities. The primary reason for the increase to the Capacity Upgrades program capital budget is the planned investment in Station Capacity Upgrades for the 2026-2030 period. This need has been identified through Regional Planning, please refer to Section 4 of Schedule 2-5-2 - Coordinated Planning with Third Parties, and is based on forecasted system requirements. The 2026-2030 plan includes the construction of four new stations: Piperville, Mer Bleue, Greenbank, and Kanata North, and upgrading three existing stations: Riverdale, Cyrville, and Bronson.

To fully utilize the increased capacity provided by the station projects, the distribution capacity upgrades program will enhance the electrical distribution network through feeder expansion and upgrades. This program accounts for the second largest increase in the Capacity Upgrades program budget for 2026-2030. This increase is primarily driven by a greater number of feeder integration projects required to support the planned construction of the four new stations and the planned upgrade of three existing stations identified previously.

The Non-Wires Capacity Upgrade is a new program which accounts for the remaining expected increase in the Capacity Upgrades program for 2026-2030. It aims to improve grid capacity and reliability by implementing alternatives to traditional infrastructure upgrades, such as utility owned battery energy storage solutions (BESS) and Non-Wires Customer Solutions Program. The program's primary focus is on five constrained regions utilizing four BESS in combination with the Non-Wires Customer Solutions Program. These solutions are being strategically deployed in areas that meet one of the following criteria: stations requiring near-term capacity risk mitigation, distribution-connected stations with forecasted overloads of less than 7.5MVA by 2030, or areas projected to exceed capacity by 2030 and are experiencing transmission system constraints, please see Section 9.2 of Schedule 2-5-4 - Asset Management Process.

Based on a thorough analysis of the needs identified for each of the Hydro Ottawa planning regions described in Section 9.1.4 of Schedule 2-5-4 - Asset Management Process it has been

determined that the majority of these needs will require wire solutions, meaning upgrades and expansions to the physical grid infrastructure. While NWSs are not expected to cause substantial avoidance or deferral of the identified wire capacity investment needs, they will play a crucial role in moderating the pace of system demand growth and enhancing reliability in the 2026-2030 period, while continuing to support the grid in the long term. This moderation will provide Hydro Ottawa with the lead time to construct the necessary long-term grid infrastructure solutions that are in harmony with the evolving system demand. There are three scenarios identified where NWSs would have the greatest potential in supporting capacity needs: please refer to Section 9.2 of Schedule 2-5-4 - Asset Management Process for more information.

Stations Enhancements

The capital investment for this program is detailed in Section 4 of Schedule 2-5-8 - System Service Investments. This program will improve distribution system observability and operability through cyber security investments and station modifications, including enhanced monitoring. Specifically, online transformer monitoring will proactively identify faults, improving asset observability and reliability by reducing unexpected failures. Addressing vulnerabilities, the program will also bolster cyber security at substations, improving threat detection and response to prevent disruptions and maintain reliable power delivery.

Distribution Enhancements

The capital investment for this program is detailed in Section 3 of Schedule 2-5-8 - System Service Investments. The Distribution Enhancement program modernizes the grid and addresses climate change risks through four programs: Distribution System Reliability, Distribution System Enhancements, Distribution System Resilience and Distribution System Observability. The Distribution System Reliability program improves efficiency and reliability through feeder reconfiguration and phase balancing. The Distribution System Enhancements program supports DER integration through infrastructure upgrades and pilot projects, leveraging federal funding for innovation. The Distribution System Resilience program strengthens weather resilience with strategic undergrounding, storm hardening, and line relocation, aligning with the

OEB's VASH initiative. The Distribution System Observability program enhances grid management through real-time data and remote switching improving reliability and flexibility.

The increased investment compared to the total in the 2021-2025 period is driven by the creation of the new Distribution System Observability and Distribution System Resilience programs. The Distribution System Observability program aims to enhance system reliability and reduce outage times by investing in new assets that provide real-time data on system conditions, loading, and fault locations, enabling proactive maintenance and faster response to issues. The Distribution System Resilience program focuses on mitigating the impact of adverse weather events through strategic undergrounding of lines, reinforcement of existing infrastructure, reconfiguration of feeders, and relocation of lines to less vulnerable areas.

Grid Technologies

The capital investment for this program is detailed in Section 5 of Schedule 2-5-8 - System Service Investments. This program modernizes grid management by enhancing observability and controllability through data acquisition, monitoring, and control capabilities. Focusing on ADMS, it enhances grid troubleshooting and asset monitoring, supporting data-driven decisions for preventative and predictive maintenance, and integrating with other systems. Driven by system efficiency, it addresses integration complexities, optimizes data handling, enhances reliability and security, and improves performance through a unified platform, seamless data exchange, and simplified maintenance. This upgrade reduces single points of failure, strengthens cyber security, and enables advanced analytics for better grid management.

Control and Optimization

Capital investment details are available in Section 7 of Schedule 2-5-8 - System Service Investments. This program focuses on Distributed Energy Resources Management Systems (DERMS) implementation to manage the growing complexity of DERs, improving grid stability, reliability, efficiency, and resilience. This program aims to improve operational effectiveness by increasing DER visibility and control, and improving grid efficiency. The Control and

Optimization program is a new capital program under System Service supporting grid modernization efforts by enhancing the Advanced Distribution Management System (ADMS) with new modules like the Distributed Energy Resource Management System (DERMS). These upgrades enable several grid modernization functionalities in tandem with observability and controllability devices facilitating the improvement of grid stability, efficiency, and resilience, enabling better grid management and real-time outage restoration.

Field Area Network

The capital investment for this program is detailed in Section 6 of Schedule 2-5-8 - System Service Investments. The Field Area Network (FAN) program is essential for Hydro Ottawa's digital and grid modernization, providing the communication backbone for grid devices and central systems.

Four key initiatives—Optical Transport Network (OTN) Fiber Network Resilience, Wireless Communication Private Long-Term Evolution (PLTE) pilot), Intelligent Electronic Device Management, and OTN cyber security—enhance reliability, security, and efficiency. Driven by system efficiency, the FAN enables real-time data access for grid modernization and DER integration, strengthens cyber security, and improves outage response by providing grid visibility and control.

3.4. GENERAL PLANT

The General Plant category encompasses a diverse set of capital programs essential for maintaining and advancing Hydro Ottawa's IT and facility infrastructure, operational capabilities, and customer service excellence. These investments address areas such as facility infrastructure, fleet renewal, IT and cyber security infrastructure, and customer engagement. By upgrading deteriorating systems, introducing advanced technologies, and enhancing operational facilities, these programs ensure Hydro Ottawa remains well-equipped to meet evolving industry demands, regulatory requirements, and customer expectations. The planned initiatives support

strategic goals like grid modernization, sustainability, and workforce readiness while promoting efficiency, innovation, and resilience in Hydro Ottawa's operations.

Expenditure under this investment category is increasing by 75% from $76M in the 2021-2025 period to $134M the 2026-2030 period. The primary driver for this increase is due to increased funding under the Connection Cost Recovery Agreement (CCRA) program required to support the increased number of transmission upgrades required to service new and upgraded stations. An increase in the Fleet Replacement program is driven by the need to replace vehicles that have reached end of useful life and for additional vehicles required to support the increase in planned workforce, as indicated in Table 10. See Schedule 2-5-5 - Capital Expenditure Plan and Schedule 2-5-9 - General Plant Investments for further breakdown of the General Plant capital expenditure program.

Table 10 - General Plant Capital Expenditure Variance by Capital Program 2021-2025 DSP vs. 2026-2030 DSP ($'000 000s)[28]

Capital Program	Historical / Bridge Years	Test Years	Variance
	2021-2025	2026-2030	
CCRA	$ 17	$ 46	$ 29
Fleet Replacement	$ 18	$ 41	$ 23
Tools Replacement	$ 3	$ 5	$ 2
Buildings - Facilities	$ 7	$ 7	$ (1)
Grid Technology	$ 2	$ 4	$ 2
Meter to Cash	$ 4	$ 9	$ 5
Customer Engagement Platform	$ 7	$ 3	$ (5)
Enterprise Solutions	$ 6	$ 1	$ (4)
Infrastructure and Cyber Security	$ 11	$ 15	$ 4
Data and System Integrations	$ 2	$ 3	$ 2
Total Capital Expenditures	**$ 76**	**$ 134**	**$ 57**
Capital Contributions	$ (4)	$ (13)	$ (9)
Net Capital Expenditures	**$ 73**	**$ 121**	**$ 48**

The Capital Programs encompassed within the General Plant investment category are detailed below.

CCRA - Connection Cost Recovery Agreement

The capital investment for this program is detailed in Section 7 of Schedule 2-5-9 - General Plant Investments. The CCRA program funds Hydro Ottawa's share of transmission infrastructure upgrades, determined through system capacity assessments. These upgrades include connections for new and upgraded stations and addressing equipment limitations at Hydro One Networks Inc. (Hydro One)-owned stations. Hydro Ottawa contributes to the costs of these upgrades, ensuring grid reliability and supporting growth. Key projects include new

[28] Totals may not sum due to rounding.

stations (Hydro Road, Mer Bleue, Kanata North, Greenbank) and upgrades to existing stations (Cyrville, Bronson, Carling, King Edward, Hinchey). This investment will increase station capacity by over 811MVA, improving DER hosting capacity and reliability, and supporting customer growth. Driven by the need to address capacity constraints, the CCRA program responds to load requests and without these investments Hydro Ottawa may not be able to meet future demand.

Fleet Replacement

The capital investment for this program is detailed in Section 11 of Schedule 2-5-9 - General Plant Investments. This program plans for additional vehicles required for increased staffing needs as well as replacing aging vehicles with modern, efficient alternatives to support safety and operational needs and to reduce carbon emissions. Over the 2026-2030 rate period, a total of 140 vehicles at a cost of $41M are planned to be purchased in order to replace vehicles at the end of their useful lives and account for additional vehicles required to support workforce growth.

Tools Replacement

The capital investment for this program is detailed in Section 9 of Schedule 2-5-9 - General Plant Investments. This program updates and replaces outdated equipment and tools to enhance operational efficiency, support field staff, and improve safety. The program ensures workforce readiness and aligns with modern operational standards.

Buildings - Facilities

The capital investment for this program is detailed in Section 10 of Schedule 2-5-9 - General Plant Investments. This program focuses on maintaining and upgrading office and administrative facilities to support workforce needs, improving energy efficiency, and providing a safe working environment. These investments also align with Hydro Ottawa's sustainability goals and level of organizational growth.

Grid Technology

The capital investment for this program is detailed in Section 6 of Schedule 2-5-9 - General Plant Investments. This program addresses the maintenance and upgrade of tools and software that support modernization of grid operations, integrate new technologies like DERs and support grid planning. The program focuses on network visualization and management, data collection and network modelling and simulation.

Meter to Cash

The capital investment for this program is detailed in Section 2 of Schedule 2-5-9 - General Plant Investments. This program supports critical business functions such as billing, meter reading, collections, and reporting. Upcoming upgrades to systems like Oracle's Customer Care & Billing (CC&B) and AMI aim to ensure compliance, improve customer self-service options, and address end of life infrastructure.

Customer Engagement Platform

The capital investment for this program is detailed in Section 3 of Schedule 2-5-9 - General Plant Investments. This program encompasses tools such as MyAccount, outage communication systems, Hydro Ottawa's website, and energy management tools. It prioritizes enabling intuitive self-service, delivering detailed energy insights, and enhancing customer satisfaction through seamless digital experiences. Furthermore, these digital platforms enable Hydro Ottawa to gather valuable customer insights that can also be used to enhance customer experience, inform grid planning, and identify opportunities for future NWSs and customer programming.

Enterprise Solutions

The capital investment for this program is detailed in Section 4 of Schedule 2-5-9 - General Plant Investments. This program focuses on maintaining and upgrading applications such as Enterprise Resource Planning (ERP) and IT Service Management systems. These enhancements ensure business continuity, streamline workflows, and reduce cyber security

risks. Over the rate period, the program includes business continuity software and expanding self-service HR capabilities.

Infrastructure & Cyber security

The capital investment for this program is detailed in Section 8 of Schedule 2-5-9 - General Plant Investments. This program invests in strengthening IT systems to protect against cyber threats, maintain data integrity, and support business continuity. The program aims to ensure systems are secure, scalable, and aligned with industry best practices to safeguard critical infrastructure.

Data and System Integrations

The capital investment for this program is detailed in Section 5 of Schedule 2-5-9 - General Plant Investments. This program consolidates fragmented data systems to create an integrated, reliable, and efficient framework. It aims to reduce manual interventions, enable real-time decision-making, and ensure compatibility across platforms to support both operational and strategic initiatives.

4. OUTCOMES AND PERFORMANCE MEASURES

Hydro Ottawa's proposed performance framework for the 2026-2030 DSP emphasizes a direct and transparent approach to monitoring and reporting. The framework aligns with the OEB performance outcomes:

- **Customer Focus:** Prioritizing connection efficiency, grid reliability, customer engagement, and technological advancements to enhance customer satisfaction.
- **Operational Effectiveness:** Leveraging grid modernization, asset management, customer-centric operations, and workplace safety to optimize performance.
- **Public Policy Responsiveness:** Ensuring regulatory compliance, grid modernization planning, safety, and reliability to meet public policy goals.

- **Financial Performance:** Focusing on resource optimization, grid reliability with integrated DERs, data-driven decision making, and long-term financial sustainability.

Hydro Ottawa will measure performance through specific outcomes linked to Material Investment Plans (MIPs) in four investment categories: System Access, System Renewal, System Services, and General Plant. This approach ensures that investments and initiatives are strategically aligned, customer-focused, and financially responsible. The framework will enable Hydro Ottawa to effectively track progress, evaluate planning, improve operations, and identify areas for enhancement, ultimately delivering better service to customers. Refer to Schedule 2-5-3 - Performance Measurement for Continuous Improvement for full details on outcomes and performance measures.

5. OVERVIEW OF DOCUMENTS

The complete 2026-2030 DSP is included in Schedules 2-5-1 to 2-5-9 of this Application submission. It consists of nine schedules, which are outlined below and mapped back to the Chapter 5 Filing Requirement as shown in Table 11.

Table 11 - DSP Schedules Mapping to OEB Chapter 5 Filing Requirements

OEB Chapter 5 Filing Requirements- Sections	DSP Schedule
5.2.1 – Distribution System Plan Overview	2-5-1
5.2.2 – Coordinated Planning with Third parties	2-5-2
5.2.3 – Performance Measurement for Continuous Improvement	2-5-3
5.3 – Asset Management Process	2-5-4
5.4 – Capital Expenditure Plan	2-5-5 2-5-6 2-5-7 2-5-8 2-5-9

DSP Schedules:

- **Schedule 2-5-1 - Distribution System Plan Overview**

  This schedule provides a comprehensive overview of the DSP, including an outline of the key elements of the plan, and highlights important changes. It also details the 2026-2030 capital expenditure plan, aligned with Investment Priorities, and how customer preferences and expectations were incorporated into forming the Focus Areas and validating the Investment Priorities. The chapter also provides an overview of the outcomes and performance measures used to track the plan's progress and outlines the structure of the DSP documents, period, and vintage of information.

- **Schedule 2-5-2 - Coordinated Planning with Third Parties**

  This schedule examines how the DSP coordinates with customers and stakeholders. It covers:

- Customer Coordination: Outlines the various methods of customer engagement, including consultations, requests, and open houses, used to inform investment planning and ensure the DSP reflects customer priorities.
- Regional Planning: Details the collaborative regional planning process among the IESO, Hydro Ottawa, and Hydro One to ensure a reliable, cost-effective, and sustainable electricity supply for the region.
- Telecommunication Entities: Explains Hydro Ottawa's relationship with telecommunication companies, focusing on the attachment process and agreements for infrastructure sharing.
- Other Utility and Stakeholder Coordination: Describes Hydro Ottawa's coordination with various utilities and stakeholders, including the City of Ottawa, contractors, and industry groups, to ensure efficient and safe operations.
- Planning Coordination Effects on DSP: Discusses how effective planning coordination among various stakeholders is crucial for the successful planning of the distribution system, ensuring alignment, minimizing conflicts, and addressing diverse needs.

- **Schedule 2-5-3 - Performance Measurement for Continuous Improvement**

  This schedule outlines Hydro Ottawa's performance measurement framework, aligned with the OEB guidelines. It covers:

  - Historic (2021-2025) DSP Performance: Presents historical KPI data and explains the results of performance across customer, costs, asset, and system operations.
  - Historical Reliability Performance: Provides a detailed analysis of Hydro Ottawa's reliability performance trends, including SAIDI and SAIFI.
  - Continuous Improvement: Discusses ongoing efforts to enhance performance based on data analysis and feedback.

- Performance Measurement Framework: Details the framework used to measure and monitor the performance across various system areas of the DSP.

- **Schedule 2-5-4 - Asset Management Process**

  This schedule provides an in-depth look at asset management within the DSP. It covers:

  - Planning Process: Describes Hydro Ottawa's integrated business planning process, including strategic objectives, customer engagement, and the development of core business strategies that guide investment plans.
  - Asset Management Overview: Presents Hydro Ottawa's Asset Management System, its certification, scope, strategy, objectives, process overview, and process enhancements.
  - Asset Management Process: Explains the detailed, four-stage asset management process (prepare, plan, optimize, execute) used by Hydro Ottawa to manage its assets and planned expenditures.
  - Overview of Assets Managed: Details the various assets managed by Hydro Ottawa, including their demographics, condition, failure rates, risk profiles, and system utilization.
  - Asset Lifecycle Optimization: Describes the policies and practices used by Hydro Ottawa to optimize asset lifecycles, including typical useful life (TUL), replacement/refurbishment policies, and testing inspection and maintenance programs.
  - System Capacity Assessment: Presents Hydro Ottawa's comprehensive assessment of system capacity needs, including load forecasting, NWSs, and the integration of renewable energy resources.

- **Schedule 2-5-5 - Capital Expenditure Plan**

  This schedule provides a comprehensive analysis of capital investments within the DSP, focused on the 2026-2030 period. It covers:

  - Forecast Expenditure: Presents the 2026-2030 forecasted expenditures by investment category, driven by Hydro Ottawa's investment strategy.
  - Historical and Forecast Expenditure Overview: Outlines the variance between the total of 2021-2025 timeframe vs. OEB-Approved amounts, and compares them to the 2026-2030 Capital Expenditure plan.
  - Capital Expenditure Summary: Details the historical performance and forecasted expenditures by investment category, further divided by Capital Program and Budget Program.
  - Impact on Operation and Maintenance Costs: Discusses how capital expenditures affect routine system operation and maintenance costs, including cost reductions.

  Additionally, Capital Programs are described under the following schedules for each Investment Category:

  - Schedule 2-5-6 - System Access Investments
  - Schedule 2-5-7 - System Renewal Investments
  - Schedule 2-5-8 - System Service Investments
  - Schedule 2-5-9 - General Plant Investments

6. DSP PERIOD

The DSP provides capital expenditure plans and supporting information for the 2026-2030 Test Year period, along with Historical and Bridge Year information for 2021-2023 and 2024-2025, respectively.

7. VINTAGE OF INFORMATION

Unless otherwise stated, the information and details provided are based on actual numbers as of December 31, 2023.

COORDINATED PLANNING WITH THIRD PARTIES

1. OVERVIEW

Hydro Ottawa's Distribution System Plan (DSP) relies heavily on input achieved through collaboration. The utility prioritizes integrated planning, ensuring alignment with customers, the transmitter and IESO through regional planning, and the community. Customer engagement on an ongoing basis is achieved through open houses, presentations, and a formal consultation process that directly shaped the DSP's strategic focus and investment priorities. Hydro Ottawa works with the IESO and Hydro One Networks Inc. (Hydro One), providing planning forecasts and exploring solutions to address capacity needs, with a particular focus on the complexities of decarbonization and electrification. Hydro Ottawa also coordinates with telecommunication companies regarding infrastructure attachments, the City of Ottawa on development and utility projects (including the LRT and "Energy Evolution" strategy), and contractors and developers to streamline projects. Participation in industry working groups provides access to shared knowledge and cost-effective technology. This multi-faceted coordination is crucial for a successful and responsive DSP.

2. INTRODUCTION

This Schedule of the DSP explains how Hydro Ottawa coordinates its plans with third parties and how the results of this planning have been factored into the proposed DSP.

Hydro Ottawa operates within the majority of the City of Ottawa and the Municipality of Casselman, and has effectively coordinated with third party stakeholders, grouped in three major categories in regards to coordinated planning:

1. **Customers:** Grouped by residential, small commercial, commercial & industrial (C&I), and key accounts customers;
2. **Regional Planning Authorities:** IESO and Hydro One; and

3. **Community Stakeholders:** Including Telecommunication Entities, Enbridge Inc. (Enbridge), City of Ottawa, City of Ottawa Utilities Committee, and Ottawa Light Rail Transit (LRT).

Coordination with third-party stakeholders has resulted in a comprehensive, efficient, and well-integrated DSP. This integrated planning process ensures that Hydro Ottawa's strategy is aligned with its customers' needs, the plans and objectives of the regional electrical system, and the needs of other stakeholders in the community. This approach fosters optimized resource allocation, streamlined processes, shared infrastructure, and the avoidance of redundant investment, contributing to a cost-effective plan. Ultimately, this strategy enables Hydro Ottawa to deliver reliable and resilient access to electricity and meet the ever-growing needs of customers in Ottawa and Casselman.

3. CUSTOMER COORDINATION

Customer coordination is a key input into the planning process. Hydro Ottawa utilizes a mix of ongoing and specific engagements with customers to inform investment planning and coordinate the work undertaken within its plans. For example, Hydro Ottawa regularly conducts customer engagement through open houses and community presentations. These meetings give customers and Hydro Ottawa employees a chance to discuss upcoming projects, emergency preparedness, and other topics of interest or concern. Additionally, customers are engaged through their many daily interactions with company staff. Schedule 1-4-1 - Customer Engagement Ongoing outlines a comprehensive summary of the tools, activities, and interactions which comprise Hydro Ottawa’s customer engagement as part of its normal course of business. In addition, a two-phase customer consultation was conducted as a part of the 2026-2030 Rate Application planning process, as described in Schedule 1-4-2 - Customer Engagement on the 2026-2030 Application.

This multi-faceted approach to customer coordination ensures that Hydro Ottawa’s DSP reflects the needs and priorities of its customers.

3.1. CUSTOMER CONSULTATION

Customer consultation is crucial to Hydro Ottawa's business strategies and investment plans. Accordingly, Hydro Ottawa has implemented several methods of engaging customers related to its Asset Management Process, including activities that are integrated into normal business operations. Feedback from customers has been instrumental in shaping this DSP, demonstrating Hydro Ottawa's commitment to understanding and meeting customer needs and preferences. Customer consultations related to Asset Management which are part of Hydro Ottawa's ongoing customer engagement activities are described in more detail in Schedule 1-4-1 - Customer Engagement Ongoing. Three main categories of this customer engagement are as follows and described below:

1. Customer Requests and Engagement
2. Keeping Ottawa Connected
3. Project Open Houses

3.1.1. Customer Requests and Engagement

Hydro Ottawa handles a wide range of customer requests daily, from new service connections and upgrades to major infrastructure relocations. The utility uses online service request forms to efficiently manage these requests and ensure they reach the appropriate team. In addition, in 2024, Hydro Ottawa established a project intake group responsible for ensuring customer requests are more effectively tracked, that resources are appropriately assigned and that service levels related to responses are adhered to. Additional information related to the intake initiative is provided in Section 4 of Schedule 1-3-4 - Facilitating Innovation and Continuous Improvement.

For smaller requests, like connecting a new home or upgrading an existing service, Hydro Ottawa's service desk and layout groups work collaboratively to review the request and create a design if needed. Larger projects, such as those involving significant new loads or relocating

existing equipment, are handled by the distribution design group, which conducts a more in-depth review to assess the impact on the electrical grid.

When these larger projects require upgrades to Hydro Ottawa's infrastructure, the utility looks for opportunities to integrate them with planned system expansions. This approach allows Hydro Ottawa to share costs and use resources more efficiently, ultimately benefiting all of its customers.

For major projects involving large commercial or Key Account customers, such as the LRT, or Ottawa Community Housing, Hydro Ottawa assigns dedicated contacts within its project management teams, and utilizes existing relationships with the Key Accounts team. This provides these customers with personalized support and coordination throughout their projects.

Hydro Ottawa's goal is to provide a seamless and responsive experience for all its customers, whether they're connecting a new home or undertaking a major development project. The utility is committed to meeting customer needs efficiently and effectively while ensuring the reliability, safety, and sustainability of the electrical grid.

The outcomes and feedback from external requests are integrated into Hydro Ottawa operations to support continuous learning, and the number and scope of requests are used to support growth forecasting in the DSP.

3.1.1.1. *Key Accounts*

As outlined in Section 2.3 of Schedule 1-4-1 - Customer Engagement Ongoing, Hydro Ottawa’s Key Accounts team regularly and proactively engages with Hydro Ottawa’s largest customers. One key function of this engagement is identifying upcoming work that might impact the utility, such as large load requests, customer distributed energy resource (DER) projects, and electrification goals. Identifying large and potentially impactful projects early on helps Hydro Ottawa’s planning and forecasting. The Key Accounts team is also able to guide customers on

the proper process to submit formal requests, helping ensure that the required and correct information is provided to Hydro Ottawa in a timely manner.

3.1.2. Keeping Ottawa Connected

After the 2022 Derecho storm, Hydro Ottawa developed "Keeping Ottawa Connected," a community presentation focusing on emergency preparedness, power restoration, vegetation management, and generator safety. Since launching in 2023, Hydro Ottawa has delivered 20 of these presentations to nearly 750 people. Participants come away with a better understanding of their role in emergency preparedness, Hydro Ottawa's restoration process, efforts to enhance grid resilience, and the communication tools available. Customer engagement during these sessions has also provided the company with insights into evolving customer needs, informing future services and delivery. The outcomes and feedback of Keeping Ottawa Connected are integrated into Hydro Ottawa operations to support continuous learning. Although the outcomes of these consultations do not directly impact the DSP, they are factored into Hydro Ottawa's day to day processes.

3.1.3. Project Open Houses

Hydro Ottawa regularly holds open houses to consult with customers regarding major projects. In 2021, due to the pandemic, Hydro Ottawa moved to a virtual format to ensure public safety. This shift allowed for greater flexibility in scheduling and resulted in increased customer participation. As restrictions eased, Hydro Ottawa adopted a hybrid approach, offering both virtual and in-person sessions.

Open houses cover a range of topics, including the project overview, rationale, anticipated benefits, impacted areas, timelines, scope of work, and site restoration plans. Customers are given the opportunity to ask questions and provide feedback directly to the Hydro Ottawa employees that are involved in the project. This direct engagement strategy has often led to improvements in project design and scheduling. For more information regarding the open house process and examples of integrated customer feedback, please refer to Section 2.5.1 of

Schedule 1-4-1 - Customer Engagement Ongoing. The outcomes of project open houses are constantly reviewed and integrated into Hydro Ottawa operations to support continuous learning, although the outcomes of these consultations do not directly impact the DSP, they are factored into Hydro Ottawa's day-to-day processes.

4. REGIONAL PLANNING

The IESO regional planning process in the Greater Ottawa Area involves collaboration among the IESO, Hydro Ottawa, and Hydro One. This collaborative effort helps identify the current and future capacity needs of the electrical system and ensures a reliable, cost-effective, and sustainable electricity supply for the region.

As part of this planning process, Hydro Ottawa provides a comprehensive long-term planning load forecast, the Integrated Regional Resource Planning (IRRP) forecast, for its service territory. For more information, please refer to Section 9.4.2 of Schedule 2-5-4 - Asset Management Process. This planning forecast aids in identifying transmission lines and distribution stations reaching or exceeding their capacity limits in the short, medium, and long term. Hydro Ottawa also provides information on limitations within the planning area that might not be readily apparent to the working group.

The IRRP process identifies cost-effective and sustainable solutions to ensure efficient and reliable energy distribution. The solutions include "wire" options such as: new transmission lines, autotransformers, step-down transformer stations, voltage control devices, upgrades to existing infrastructure, or control actions or protection schemes that influence how the system is operated to avoid or mitigate certain reliability concerns. Capacity needs that would be best suited for a more detailed assessment for Non-Wires Solutions (NWSs) are also identified. This includes local utility-scale generation or storage, DERs (including distribution-connected generation and demand response), CDM or electricity Demand-Side Management (eDSM), or distribution-level load transfers.

The main stages of the IESO regional planning process are:

- Needs Assessment, please refer to Section 4.1 - Needs Assessment
- Scoping Assessment, please refer to Section 4.2 - Scoping Assessment
- IRRP, please refer to Section 4.3 - Greater Ottawa Integrated Regional Resource Planning
- Regional Infrastructure Plan (RIP), please refer to Section 4.4 - Greater Ottawa Regional Infrastructure Plan

Results from the regional planning process are incorporated into Hydro Ottawa's investment plan to meet the capacity needs of the system and play a pivotal role in shaping Hydro Ottawa's investment plan. By incorporating these insights, Hydro Ottawa can strategically allocate resources to ensure the system's reliability, resilience, and ability to meet the growing energy demands of the Ottawa region.

Government decarbonization initiatives have added increased complexity to the regional planning process due to the impacts of decarbonization and the uncertainty of associated electrification rates at the community level. To address this a Decarbonization Sub-Working Group was created to support the IRRP. In support of this sub-working group, Black & Veatch was engaged to create a variety of load scenarios for 2025 to 2050 based on varying regional and local factors with refinement from the Decarbonization Sub-Working Group. Details of the working group are summarized in Section 4.3.1 - Decarbonization Sub-Working Group.

A key finding of the IESO regional planning process was the need for investment to support the region's electrification strategy. This includes accommodating increased electricity consumption and demand from new homes and businesses, as well as supporting the transition to electric vehicles (EVs) and other clean energy technologies. Hydro Ottawa's investment plan reflects these findings, ensuring the electricity grid can handle the increased demand and contribute to a sustainable energy future for the region.

4.1. NEEDS ASSESSMENT

A Needs Assessment is conducted at least every five years, or more frequently if one of the parties to the process raises a regional reliability or delivery performance issue, or if there are concerns with respect to the system's ability to handle a customer load request. The transmitter leads this analysis, with data provided by the IESO and the local distribution companies (LDCs). This assessment examines changes in demand within a specific area and conducts an initial screening to identify regional or sub-regional needs.

Due to increased load growth in the region, the third regional planning cycle was triggered in advance of the 5-year period. In 2022, an assessment was conducted by Hydro One Transmission to evaluate the needs of the Greater Ottawa region. The following asset renewal needs were identified by Hydro One over the planning horizon based on asset condition assessment:

- Lisgar TS: Replace transformer T1
- South March TS: Replace transformers T1/T2
- S7M Line Refurbishment

In terms of transformation capacity, many stations were found to be near or exceeding their limits. While load transfers can mitigate the need in the near term, station capacity was recommended to be reviewed as part of this regional planning cycle. The assessment's findings highlighted the necessity for enhanced regional collaboration, prompting the initiation of a Scoping Assessment.

4.2. SCOPING ASSESSMENT

During this phase, the IESO collaborates with the transmitter and LDCs to determine the most suitable planning strategy, as follows:

- If there is potential for integrating options such as conservation, generation, distribution,

or emerging technologies, an IRRP will be recommended.

- If needs can be met solely through enhancements to transmission lines or infrastructure, a RIP led by the transmitter will be recommended.
- Alternatively, it may be recommended that the LDC and transmitter jointly plan for the necessary local infrastructure investments.

In the Scoping Assessment phase, the progress on recommendations from the previous IRRP, which was completed in March 2020 was reviewed. A summary of the recommendations and updates on progress made for completions are listed below:

Kanata-Stittsville

- Implement the North Kanata Retrofit Top-Up Program and the North Kanata Smart Thermostat Program, targeted commercial and residential energy efficiency programs.
- Improve distribution load transfer capability at the heavily loaded stations Marchwood MTS and Kanata MTS – Ongoing.

Southeast Ottawa

- Construction of a new 230kV connected supply station in southeast Ottawa. Construction of the new Piperville Station by Hydro Ottawa is ongoing and planned for energization in 2026. Please refer to Section 2 of Schedule 2-5-8 - System Service Investments for further detail.

Central Ottawa

- Replacement of transformers T2 and T3 at Slater TS due to end-of-life, with larger transformers, approximately 100 MVA, as was done for the recent replacement of T1 – work was completed by Hydro One in 2024.
- Replacement of transformers T1 and T2 at Lincoln Heights due to end-of-life – work completed by Hydro One in 2024.
- Replacement of transformers T1 and T2 at Albion TS due to end-of-life – planning

underway with an expected completion in 2031-2033. Hydro Ottawa has requested incremental capacity at the time of the replacement of these transformers.

Orleans

- The refurbishment and expansion of Bilberry Creek TS was cancelled due to increased forecasted demand in the Ottawa Area Sub-region. Instead, the working group considered decommissioning Bilberry Creek TS and transferring the loads to a new 230 kV connected supply station. Additionally, the existing Orleans TS will be upgraded to provide additional supply capacity. Hydro Ottawa is planning to energize the new Mer Bleue station in 2028. For further details, please refer to Section 2 of Schedule 2-5-8 - System Service Investments.

Regional 115 kV System

- The smaller Merivale autotransformer replacement need was identified, and the addition of a third 230-115 kV autotransformer at Merivale TS was evaluated. The Hydro One project includes replacing autotransformer T22, six 230 kV circuit breakers, four 115 kV circuit breakers, and installing a new autotransformer T23. This project is currently underway with a planned in-service date of 2029.

The Greater Ottawa Scoping Assessment Outcome Report[1] was completed and published in March 2023. The report recommended that an IRRP be undertaken to identify, evaluate and recommend solutions to address the needs identified for the Ottawa sub-region.

4.3. GREATER OTTAWA INTEGRATED REGIONAL RESOURCE PLANNING

When the Scoping Assessment Outcome Report concludes that an IRRP is necessary, the IESO, transmitter, and LDCs collaborate to develop the IRRP.

[1] Independent Electricity System Operator, *2023 Greater Ottawa Scoping Assessment Outcome Report*, (March 21, 2023).

The IRRP considers various resource options to address regional electricity needs, including:

- Conservation measures and demand management;
- Distributed generation;
- Large-scale generation;
- Transmission enhancements;
- Distribution upgrades; and
- Innovative solutions, including DERs, such as: renewable generation, energy storage, combined heat and power, and microgrids.

The IRRP evaluates these options based on their feasibility, cost, reliability, alignment with government policies (e.g., Conservation First Framework and Long-Term Energy Plan), environmental performance, and community preferences. The resulting plan will propose ways to meet the identified electricity needs, along with implementation and monitoring strategies.

Although IRRPs cover a 20-year planning horizon, they prioritize actions for the near term (0-5 years) and medium term (5-10 years), with long term (10-20 years) options being deferred for future consideration.

Community and stakeholder engagement remain crucial throughout the IRRP development phase. Ongoing dialogue facilitates an understanding of regional planning processes, allowing for local input and a successful implementation.

The completion of the Greater Ottawa Region IRRP is planned for Q1 2025. A Planning Status Letter has been provided by the transmitter to confirm the alignment of Hydro Ottawa's investment plans with the preliminary findings of the Regional Planning Process, refer to Attachment 2-5-2(A) - Planning Status Letter. As part of the IRRP process, a Decarbonization sub-working group was established to review plans and priorities of communities around electrification to understand the impact.

4.3.1. Decarbonization Sub-Working Group

The initial 20-year demand forecast provided in early 2023 for the IRRP lacked impact from electrification. The Decarbonization Sub-Working Group was asked to develop forecast scenarios that reflected local community energy plans and priorities around electrification. A High Growth Scenario, reflecting a full decarbonization of the region, was discussed through meetings with the sub-working groups. The IESO led six meetings between March 2023 to December 2023 with representatives from the City of Ottawa, Hydro Ottawa and Hydro One Distribution to develop the new scenario. Hydro One Transmission and Enbridge participated in the meetings as observers. In the Toronto and Ottawa IRRPs, the IESO included Enbridge as an observer on a pilot basis. The role of the observer is limited to providing feedback on areas where they are the subject matter experts. Electrification forecasting was difficult due to a lack of specific, localized targets. This disconnect between broad policy goals and practical implementation created uncertainty and hindered stakeholder engagement. A more robust framework with regional and local considerations was needed for effective electrification planning. To this end, Hydro Ottawa engaged Black and Veatch in April 2023 to evaluate the implications of the decarbonization initiatives on its system.

To determine the potential implications of decarbonization initiatives on Hydro Ottawa's distribution network from 2024 to 2050, Black and Veatch developed load scenarios. Each scenario incorporated different assumptions about decarbonization factors such as energy efficiency, population growth, EV adoption, and building heating.

Black and Veatch presented the details of the scenario assumptions to the Decarbonization sub-working group. Assumptions around population growth and heat pump efficiency in cold weather were modified based on feedback from the City of Ottawa and Enbridge Gas, respectively. A fifth scenario was added to address load sensitivity from customers switching to gas during colder weather conditions (less than -10 degrees Celsius).

Following these adjustments, three scenarios were adopted by the Sub-Working Group for use in regional planning: the Reference Scenario, the Policy-Driven Scenario (high sensitivity), and the Dual Fuel Scenario (low sensitivity). The Sub-Working Group decided to use the Reference Scenario as the primary scenario of investment planning.

Hydro Ottawa has integrated the IRRP forecast Reference Scenario, into its capacity planning process as a crucial sensitivity analysis. This is aimed at proactively informing the utility's investment plans and ensuring that these plans remain aligned with recommendations set out in the IRRP. By incorporating this sensitivity analysis, Hydro Ottawa can better anticipate and respond to potential future scenarios, thus safeguarding the reliability and effectiveness of its capacity investments. For a more detailed and comprehensive understanding of Hydro Ottawa's Planning Forecast and the integration of the IRRP Reference Scenario, refer to Section 9.4 of Schedule 2-5-4 - Asset Management Process.

4.3.2. IRRP Preliminary Results

This section describes the preliminary near- and medium-term asset renewal and capacity constraint needs identified through the IRRP cycle. The asset renewal needs focus on the replacement and capacity upgrades of several transformer stations, including South March TS, Lisgar TS, Russell TS, Albion TS, and Riverdale TS. The capacity constraints section highlights the need for additional transformation capacity in Kanata North, Moulton/Cyrville/Overbrook, Nepean 8kV, and Downtown Ottawa regions.

Asset Renewal Needs:

- **South March TS:** The station's two 230kV/44kV transformers, commissioned in 1971, need to be replaced due to their current asset condition. The IRRP working group is evaluating increasing the transformers' capacity by 50MVA to meet the long-term demand forecast. This Hydro One project has a planned in-service date of 2030-2032. Hydro Ottawa may need to contribute to the cost of increasing the station's capacity

under the Connection and Cost Recovery Agreement (CCRA) program. For further details, refer to Section 7 of Schedule 2-5-9 - General Plant Investments.

- **Lisgar TS:** There are two T1/T2 115kV/13.8kV, 45/60/75MVA transformers at the station. Transformer T1 was in-serviced in 1974 and based on its asset condition it needs replacement. Based on the non-coincident forecast, the station loading has reached its capacity. The T1 transformer capacity will be increased at the time of replacement to 100MVA. This Hydro One project has a planned in-service date of 2025. Hydro Ottawa might need to contribute to the cost of increasing the station's capacity under the CCRA program in 2025.
- **Russell TS:** The two 45/60/75 MVA transformers T1 and T2 were installed in 1975 and 1971, respectively, and require replacement. A Hydro One project, coordinated with Hydro Ottawa, is currently underway to replace transformers T1/T2 with 60/80/100MVA units. The planned in-service date for the upgraded transformers is 2027. Upgrading capacity at this station supports the capacity needs in the East 13kV region. Refer to Section 9.1.4.5 of Schedule 2-5-4 - Asset Management Process and Section 7 of Schedule 2-5-9 - General Plant Investments for capacity needs and project details.
- **Albion TS:** The two 75 MVA transformers T1 and T2 were built in the 1970s. They have been identified for replacement with new closest standard size 60/80/100 MVA units. All existing Hydro One owned circuit breakers will be replaced with breakers of similar ratings. The planned in-service date of the project is in 2031. No capital contribution is expected from Hydro Ottawa for increased capacity since transformers are expected to be replaced to the closest standard size.
- **S7M Line refurbishment:** The 115 kV circuit, spread across several S7M line sections totaling 6.5 km, have been identified at or near their end of service life. It was suggested to replace conductors, wood poles, insulators, and other components. Some sections are considered for upgrades, which Hydro Ottawa, Hydro One, and IESO are working together to determine the preferred plan. No capital contribution is expected from Hydro Ottawa.

- **Riverdale TS:** Riverdale TS is a 115/13.8kV station connected to 115kV circuits A3RM, A5RK, and A6R. The 115kV breakers are identified to be replaced based on asset condition assessment. The planned in-service date of the project is in 2038. No capital contribution is expected from Hydro Ottawa.

Capacity Constraints:

- **Kanata North region:** The previous regional planning cycle identified this area as needing additional transformation capacity. Due to the IESO bulk system study being in progress at the time, temporary measures were implemented to mitigate this by load transfer and CDM programs. It was expected that the results from the IESO bulk system study could have impacted the area's supply, and therefore a plan was not developed before the results were available. The need was reviewed again during the current regional planning cycle, and the expected recommendation is a new transformer station and new 230 kV transmission circuit in the Kanata area by 2029. For capacity needs and project details, refer to Section 9.1.4.2.5 of Schedule 2-5-4 - Asset Management Process and Section 2 of Schedule 2-5-8 - System Service Investments. Hydro Ottawa is estimated to contribute to the cost of building the new transmission line to connect the new station under the CCRA program in the 2026-2030 period, refer to Section 7 of Schedule 2-5-9 - General Plant Investments and Schedule 9-2-1 - New Deferral and Variance Accounts.
- **Moulton/Cyrville/Overbrook region:** The 115kV supplied station is expected to have a large load increase in the near term. Given the location of Cyrville station near 230kV supplies, the IRRP working group is proposing to upgrade the station transformation capacity by 50MVA and change its supply to 230kV by 2028, refer to Section 3 of Schedule 2-5-8 - System Service Investments for project details. This will allow the station to meet its load forecast as well provide relief to other stations through distribution transfers. This conversion to 230kV supply will also help preserve capacity on the 115kV system which is nearing its limit. Hydro Ottawa might need to contribute to the cost of extending the transmission line to connect Cyrville under the CCRA program

in the 2026-2030 period, refer to Section 7 of Schedule 2-5-9 - General Plant Investments and Schedule 9-2-1 - New Deferral and Variance Accounts.

- **Downtown Ottawa Transformation Capacity:** Several stations in the downtown core are expected to or have reached their capacity based on the forecast. To address this several recommendations are expected from this cycle of regional planning:
  - **Bronson DS:** Upgrade 4kV station to 13kV and upgrade supply to a transmission connected station with higher rated transformers (150MVA). This will provide additional transformation capacity in the city center. For project details, refer to Section 2 of Schedule 2-5-8 - System Service Investments.
  - **King Edward TS:** Replace aging and limiting circuit breakers and cables at the station to increase the available station capacity by approximately 38 MVA.
  - **Carling TS:** Replace aging and limiting cables at the station to increase the available station capacity by approximately 40MVA.

Hydro Ottawa is estimated to contribute to the cost of removing station breaker and cable limitations at the existing Hydro One stations under the CCRA program in the 2026-2030 period, refer to Section 7 of Schedule 2-5-9 - General Plant Investments and Schedule 9-2-1 - New Deferral and Variance Accounts.

- **Nepean 8kV region:** The area directly west of Merivale TS, supplied by Manordale MTS and Center Point MTS, is predominantly supplied by 8kV distribution system. Hydro Ottawa has received some large scale customer load requests coupled with the transformation capacity being exceeded at nearly all the stations in the area has resulted in a need being identified for a new 230kV-28kV station adding 130MVA of additional capacity in the region. The new Hydro Ottawa owned station, Greenbank MTS, is planned for energization by 2028, refer to Section 2 of Schedule 2-5-8 - System Service Investments for project details.
- **Upgrades to 115kV circuits:** Several circuits have been identified as reaching capacity over the study period. The upcoming Regional Infrastructure Planning cycle is expected

to recommend upgrades to sections of F10MV, C7BM, M4G, and M5G.

- **Non-Wires Solutions:** NWSs are a valuable tool for managing growing electricity demands in Ottawa. Although they cannot replace traditional wire upgrades, they can support existing capacity and shape long-term investments. NWSs can reduce peak demand impacts, allowing for strategic phasing of wire upgrades. Due to significant growth forecasts, a tiered approach was adopted to evaluate NWSs, grouping similar needs together. While NWSs were not feasible for all issues, they showed promise for addressing voltage collapse and were thoroughly analyzed. The impact of planned large-scale battery storage projects was also considered. For further information on Hydro Ottawa NWSs to address capacity needs that align with the IRRP approach to using NWSs to manage growing electricity demands due to decarbonization goals, refer to Section 9.2 of Schedule 2-5-4 - Asset Management Process.

Solutions to address these needs are being finalized in the IRRP, and final recommendations will be available by the end Q1 2025. A Planning Status Letter dated March 14, 2025 has been provided by the transmitter to confirm the alignment of Hydro Ottawa's investment plans with the preliminary findings of the Regional Planning Process, refer to Attachment 2-5-2(A) - Planning Status Letter.

4.4. GREATER OTTAWA REGIONAL INFRASTRUCTURE PLAN

When a wires-only or transmission-based approach is determined to be the optimal solution for a planning need, a RIP is initiated. The transmitter leads this process.

A RIP can be initiated:

1. Following the Scoping Assessment: If it is determined that alternative resources cannot meet the needs.
2. During the IRRP process: If analysis indicates that a wires-only solution is part of the near-term solution.
3. Upon completion of the IRRP process: If it is determined that a wires-only solution is part of

the overall integrated solution for the region or sub-region.

The transmitter will identify the LDCs and other agencies that need to be involved in the planning studies for the RIP.

Preliminary results from the current IRRP suggest that a mix of wires-based and NWSs may be required to address capacity constraints within the region. Once confirmed, the RIP will be initiated.

4.5. RENEWABLE ENERGY GENERATION COORDINATION

Hydro Ottawa collaborates with the IESO and Hydro One to develop optimal solutions for transmission and bulk system needs within the Ottawa area as part of the IRRP. These solutions encompass conservation, demand management, distributed generation (including renewable generation), large-scale generation, transmission, and distribution. Work on the IRRP began in 2023 and is expected to be completed in the first quarter of 2025.

Additionally, Hydro Ottawa collaborates with the IESO and federal funding agencies (e.g. NRCan) to launch local programming for Hydro Ottawa customers, including programs like the Ottawa DER Large Solar PV Funding Incentive, which offers financial incentives for the installation of large solar PV systems for facility load displacement. These collaborative efforts are described in detail in Section 2.4 of Schedule 1-4-1 - Customer Engagement Ongoing.

Lastly, Hydro Ottawa collaborates with customers by reviewing renewable generation requests to determine the most suitable connection for their projects. Over the past five years, the Hydro Ottawa service region has experienced substantial growth in connected renewable generation capacity, entirely attributed to grid-connected photovoltaic generators. From 2019 to 2023, almost 300 new renewable DERs were connected under the Net Metering and Load Displacement programs, as detailed in Section 9.3.1 of Schedule 2-5-4 - Asset Management Process.

Hydro Ottawa's active participation in collaborative initiatives and programs with key stakeholders ensures that the electricity grid can meet the demands of a growing population while supporting the transition to renewable energy sources.

5. TELECOMMUNICATION ENTITIES

Hydro Ottawa has a strong relationship with the telecommunications (telecom) companies serving Ottawa as their infrastructure relies on Hydro Ottawa poles, ducts and maintenance holes. The *Building Broadband Faster Act*, introduced in 2021, encourages better coordination and quicker permit turnaround times. The legislation's intention is to provide better internet across Ontario by 2025.

5.1. ATTACHMENT PROCESS

Hydro Ottawa requires all third parties, including telecommunication (telecom) companies and local businesses, to sign an agreement prior to attaching onto its infrastructure. Once an agreement is in place, third parties must go through an attachment permitting process. Third party permits, specifically telecom permits, are submitted daily from various companies and require extensive review.

The review process allows Hydro Ottawa to assess the structural integrity of the pole in question and plan the proposed "make-ready work" for Hydro Ottawa to prepare the pole for the attacher. At this stage, the permit can be rejected, sent back for revision or accepted based on the extent of the permit and make-ready work.

Make-ready work can vary from moving a Hydro Ottawa asset to make room for the telecom's attachment to replacing a pole for structural reasons. When extensive make-ready work is required, planning is undertaken to optimize work execution.

The attachment process is designed to ensure that telecom needs are supported by Hydro Ottawa through day-to-day processes. Although these consultations do not have a direct impact on the DSP, the input received is considered in Hydro Ottawa operations.

6. OTHER UTILITY AND STAKEHOLDER COORDINATION

6.1. CITY OF OTTAWA OVERVIEW

Hydro Ottawa meets annually with the City of Ottawa's Planning Group to review new site plan circulations (see Section 6.2 - City of Ottawa Development Application Circulations) to receive updates on city standards and planning requirements. Hydro Ottawa also uses these meetings to inform the City of its standards and other requirements, and to impart to planning staff a better understanding of the local distribution system.

Hydro Ottawa engages with City of Ottawa right-of-way management personnel on a quarterly basis to discuss current and planned capital programs; municipal consent guidelines and circulation status; as well as road-cut permitting for new local, collector, and arterial roads. This has served to improve communication and information-sharing, while better coordinating required work that impacts for both parties. Hydro Ottawa also participates monthly in meetings of the City of Ottawa's Utility Coordinating Committee (UCC), where participants (including other utilities) can table issues of shared relevance. See Section 6.3 for further details.

Hydro Ottawa meets annually with the City of Ottawa's Building Department to discuss Ontario Building Code changes impacting new residential subdivision servicing, issues with overhead clearances between buildings and power lines, and opportunities to improve collaboration. These interactions have supported the smooth implementation of new requirements, for example, those relating to electric vehicle servicing for new homes.

Further engagement with the City of Ottawa takes place in the context of multi-stakeholder forums such as the IRRP Decarbonization Sub-Working Group, established through the IRRP

process. The City of Ottawa was an active stakeholder throughout this process. Refer to Section 4.3.1 for further information.

6.2. CITY OF OTTAWA DEVELOPMENT APPLICATION CIRCULATIONS

The City of Ottawa requires all construction activities within their rights-of-way to be coordinated with stakeholders. This allows utilities to consent to the proposed work or upcoming developments as well as to flag any potential efficiencies or issues.

The municipal consent process requires each utility to submit an application to the City of Ottawa for review. Once the application is approved by the City of Ottawa, the proposed plan is circulated to each utility for 15 days for their review and approval. The types of applications typically seen during this process include:

- **Site Plan Control** - Proponent's development plans for a single site
- **Zoning By-Law Amendment** - Proponent seeking to change individual lot zoning to allow for a development
- **Lifting of Holding By-law** - Municipality removing lot restriction(s) that block development
- **Official Plan** - High-level development plans
- **Demolition Control** - Proponent's demolition plans for a single site
- **Plan of Condominium** - Development plan for condominium
- **Plan of Subdivision** - Development plan for subdivision
- **Community Design Plans** - Neighborhood/community development plan
- **Road/Street/Lane Closure** - Changes in road layout
- **Heritage Applications to be considered by Council** - Proponent seeking heritage status for a premise, so as to circumvent zoning/laws

Typical comments from Hydro Ottawa include: limits of approach notifications, safety notices, permitting required, standards that must be met, and any coordination that should be taken with Hydro Ottawa.

6.3. CITY OF OTTAWA UTILITY COORDINATING COMMITTEE

The City of Ottawa hosts a monthly UCC meeting. This meeting helps ensure safe and efficient construction management within the rights-of-way. It also provides an opportunity to discuss common issues, announcements and helpful information. The committee members are: City of Ottawa, Hydro Ottawa, Hydro One, Heavy Construction Association, Enbridge Gas Distribution, Birch Hill Telecom, Bell Canada, Rogers Cable Communications, Telus Communications, Zayo Group, the Provincial and Federal Government, Flex Networks, South Nation Conservation Authority, Rideau Valley Conservation Authority, Hiboo Networks, Ontario One Call, Canada Post, NAV Canada, and National Capital Commission.

The main topics of discussion are as follows:

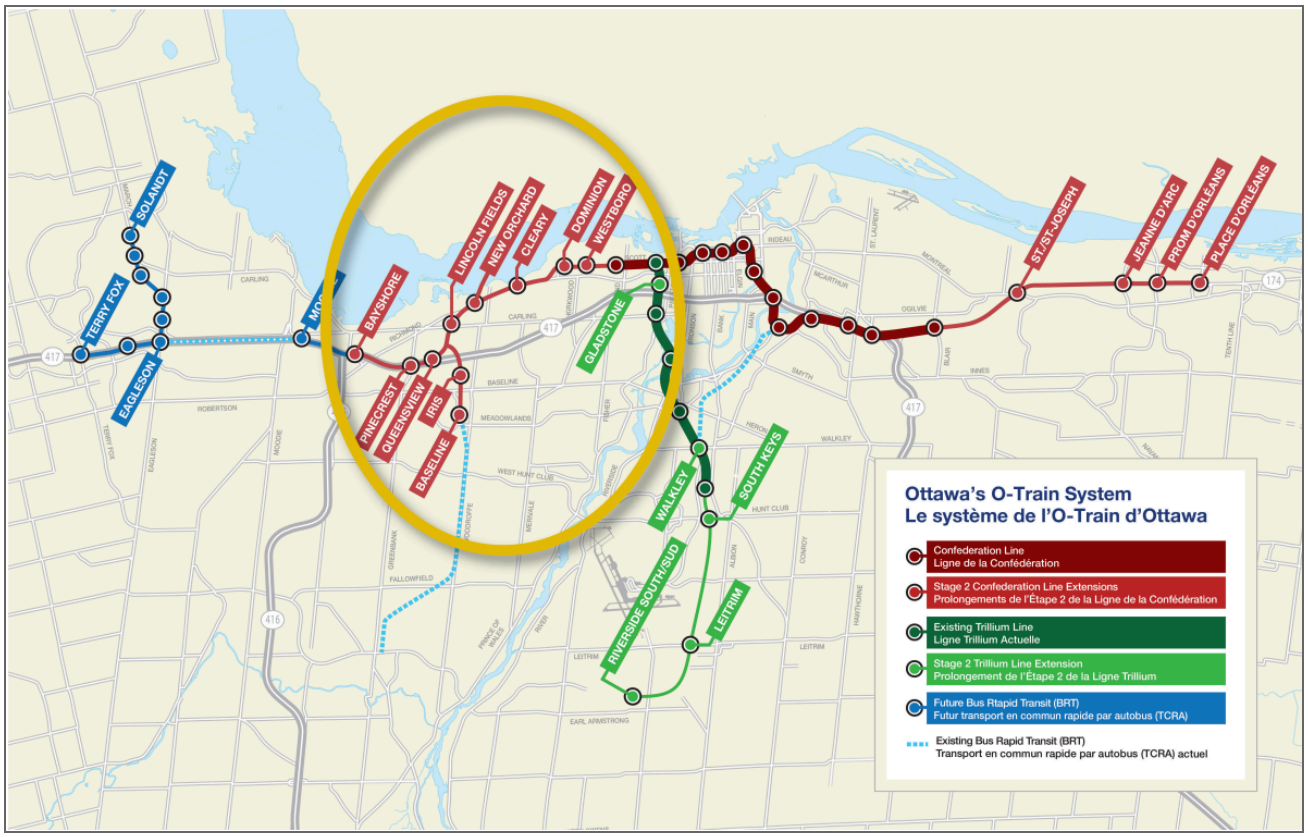
- Joint planning of construction activities
- Setting technical standards
- Steps to protect plant
- Providing a quick communication network
- Maintaining a central registry of underground utilities
- Resolving disputes between the parties
- Assisting the road authority with issues related to utility permit processes

This coordination does not directly impact the DSP, but rather is a part of day-to-day Hydro Ottawa coordination to ensure alignment with other local stakeholders and ensure safety, efficiency, and consistency.

6.4. OTTAWA LIGHT RAIL TRANSIT

The Ottawa LRT system expansion is an ongoing project aimed to improve transit connectivity and capacity in the City of Ottawa. Currently, the project is on Stage 2 which will extend the electrically-powered Confederation Line further to the west and east, and the diesel-powered Trillium Line further south, as shown in Figure 1. Stage 2 is expected to be completed by 2027, with Stage 3 being actively planned while funding options are explored.

Figure 1 - City of Ottawa Confederation Line and Trillium Line Extensions[2]



[2] City of Ottawa, Confederation Line West Light Rail Transit (LRT) Extension, https://ottawa.ca/en/parking-roads-and-travel/transportation-planning/environmental-assessment-completed-projects/confederation-line-west-light-rail-transit-lrt-extension

Hydro Ottawa is actively engaged in the project since the expansion requires upgrading and installing electrical infrastructure to service LRT stations and equipment, as well as relocating existing underground and overhead infrastructure within the planned LRT route to avoid conflict. This requires an electrical servicing strategy that is coordinated with the City of Ottawa and project contractors.

The development of the DSP has accounted for the impacts and planning considerations of LRT construction. For example, the Asset Management Process includes distribution load growth and station cable upgrades as well as the proposed forecasts for the plant relocation and upgrade program under System Access, which aligns with major City of Ottawa transportation projects. Please refer to Schedule 2-5-6 - System Access Investments for further details.

6.5. CITY OF OTTAWA'S RENEWABLE ENERGY STRATEGY – ENERGY EVOLUTION

The City of Ottawa initiated the development of a renewable energy strategy called "Energy Evolution" in 2015. The strategy aims to manage energy consumption, promote renewable energy use, and advance local economic development opportunities in Ottawa.

The City of Ottawa approved the Climate Change Master Plan in January 2020, which led to the full approval of the Energy Evolution strategy in October 2020 as one of the plan's priorities. The Climate Change Master Plan focuses on reducing community greenhouse gas (GHG) emissions by 100% by 2050 and corporate GHG emissions by 100% by 2040. It sets short-term targets of a 43% and 30% reduction, respectively, by 2025, and mid-term targets of a 68% and 50% reduction, respectively, by 2030. These targets align with the Intergovernmental Panel on Climate Change goal of limiting global warming increases to 1.5℃.

Achieving the long-term goals requires five sectors to meet this 100% target: land use and growth management, new and existing buildings, transportation, waste and renewable natural gas, and electricity. The master plan outlines projects and opportunities with two main focuses: GHG mitigation efforts and climate adaptation/resilience efforts.

Under the Energy Evolution strategy, the projected community wide GHG emission reductions required to achieve the long term goal is 6.5% in 2030 and 8.5% in 2050. Also impacting the sector are 2025 goals to increase EVs to 7% of all personal vehicle sales, increase EVs in commercial fleets to 18%, increase OC Transpo's passenger fleet to 48% zero emission, and transition 20% of residential and corporate buildings to heat pumps.

Due to the substantial increase in electrical load and required capacity, Hydro Ottawa has been actively involved in the Energy Evolution initiative since it began in 2017. The targets from the Energy Evolution initiative were considered in the Decarbonization study, which is summarized in Section 9.4.2.1 of Schedule 2-5-4 - Asset Management Process. This study explores the impact on the distribution system as electrification increases to meet 2050 goals.

6.6. CONTRACTORS AND LARGE DEVELOPERS

Hydro Ottawa recognizes contractors and large developers as crucial partners in delivering electricity services and treats them as valued customers. Hydro Ottawa's engagement strategy focuses on fostering strong relationships and ensuring efficient project execution.

For contractors, Hydro Ottawa emphasizes clear communication of technical specifications, predictable cost management through transparent estimates and tracking, and readily available crews (including after-hours support). The aim is to streamline processes like easement registration and change requests, reduce scheduling lag times, and provide easy online access to essential information like standards and documentation. To maintain open communication, Hydro Ottawa actively engages with electrical contractors through industry associations like the Ontario Electrical League (OEL) and the Electrical Contractors Association of Ottawa (ECA Ottawa), using these platforms to disseminate information about regulatory updates, safety developments, and procedural changes.

Similarly, Hydro Ottawa collaborates with builders and developers through the Greater Ottawa Home Builders' Association (GOHBA). Beyond these associations, Hydro Ottawa has

established direct engagement mechanisms, including regular coordination meetings with contractors, architects, and developers, which have already led to improvements in project communication, development plans, and intake. Looking ahead, Hydro Ottawa plans to reinstate in-person coordination meetings and developer forums to further enhance communication, address shared concerns, and inform stakeholders about important updates related to personnel, policy, costing, and service level agreements.

This multi-faceted approach demonstrates Hydro Ottawa's commitment to collaboration and continuous improvement in its interactions with these key stakeholders.

6.7. INDUSTRY WORKING GROUPS CEATI

Hydro Ottawa collaborates with organizations like Centre for Energy Advancement through Technological Innovation (CEATI) to share information, advance common goals, and support a sustainable and reliable electricity system.

CEATI provides technology solutions to electrical utility participants. Utility participants can benefit from networking, sharing information, industry benchmarking and cost-sharing on asset technical projects.

Hydro Ottawa participates in several CEATI programs such as Protection & Control, Distribution Line Asset Management, Station Equipment Asset Management, Advanced Distribution Operations, Energy and Integration Strategy, Grounding and Lightning, and Power Quality. Knowledge sharing with other power distribution utilities to solve technical issues allows Hydro Ottawa to enhance its system and provide higher levels of reliability at lower cost.

7. PLANNING COORDINATION EFFECTS ON DSP

Effective planning coordination among customers, regional planning authorities, telecommunication entities, other utilities and stakeholders is crucial for successful planning of the distribution system. Collaboration and communication enable comprehensive planning,

efficient infrastructure development, and the integration of DSP into the overall urban fabric. This coordination ensures that plans align with regional priorities and development, minimizes conflicts with existing infrastructure, and effectively addresses the needs of diverse stakeholders, including Hydro Ottawa customers.

March 14, 2025

Margaret Flores,
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Hydro One Networks Inc.

483 Bay Street
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HydroOne.com

Via email: margaretflores@hydroottawa.com

Dear Ms. Flores,

Subject: Regional Planning Status – Hydro Ottawa Service Area

This letter is in response to your request for a Planning Status letter. For the purposes of regional planning the province has been divided into 21 regions. A map showing details with respect to the 21 regions[1] and the list of Local Distribution Companies (LDCs) in each region are attached in Appendix A and B respectively. Hydro One Networks Inc. is the lead transmitter in 20 regions and Hydro Ottawa's service area belongs to the Greater Ottawa Region covering Ottawa, Kanata, Nepean, Goulbourn and Gloucester.

Hydro Ottawa load is supplied by Albion TS, Almonte TS, Bilberry Creek TS, Bridlewood MTS, Cambrian MTS, Carling TS, Centrepoint MTS, Cyrville MTS, Ellwood MTS, Nepean Epworth MTS, Fallowfield DS, Hawthorne TS, Hinchey TS, Kanata MTS, King Edward TS, Limebank MTS, Lincoln Heights TS, Lisgar TS, Manordale, MTS, Marchwood MTS, Moulton MTS, Merivale MTS, Nepean TS, Orleans TS, Overbrook TS, Richmond MTS, Riverdale TS, Russell TS, Slater TS, South Gloucester DS, South March TS, St Isidore TS, Terry Fox MTS, Upland MTS and Woodroffe TS in the Greater Ottawa Region.

This letter confirms that the second cycle of the Regional Planning process for the Greater Ottawa region was completed in December 2020. The current third regional planning cycle is currently underway, and the Needs Assessment (NA)[2] report was completed in December 2022 followed by the Scoping Assessment (SA)[3] in March 2023. The Integrated Regional Resource Planning (IRRP) phase is underway and scheduled for completion in March 2025. The final phase of the regional planning process, the Regional Infrastructure Plan (RIP) phase, will follow the completion of the IRRP in Q4 2025.

A summary of the regional planning status, including needs and plans currently identified (up to and including the 3rd cycle Needs Assessment and preliminary results from the ongoing Integrated Regional Resource Plan) in the Greater Ottawa region that affects Hydro Ottawa's service area is provided below. Also please note that, the effect of electrification, decarbonization, and the connection of large scale industrial and commercial customers growth in the region exceeds all historical projections. For example, the winter Gross electricity demand is expected to increase significantly and can double in the next

[1] Hydro One Regional Planning
[2] Greater Ottawa Needs Assessment
[3] Greater Ottawa Scoping Assessment

ten years. This will result in additional needs that will be identified during the next stages of the current and future regional planning cycle.

The previous regional planning cycle and the 3rd cycle Need Assessment identified the following needs:

Supply/transformation capacity need:

- Merivale TS: The need for additional 230/115kV auto-transformation capacity at Merivale TS was assessed. It is recommended to replace autotransformer T22, six (6) 230kV circuit breakers and four (4) 115kV circuit breakers, and the installation of a new autotransformer T23. This project is currently underway with planned in-service date of project is 2029.

- Piperville MTS: A new station was recommended to address the growing demand in the city's southeast and to address overloads at Leitrim MS. The project is ongoing with in service planned in February 2026 and with Hydro Ottawa building the transformer station and Hydro One providing connection to the transmission circuit.

- Mer Bleue MTS: An IESO-led study initiated in 2022 has reviewed different options to address the load growth in the east end of the city. From the findings of the study, the recommendation of the previous planning cycle completed in 2020 has changed and it was determined that, based on the expected demand new transformation capacity supplied from the 230kV network is required. It was also determined that Bilberry Creek TS, a 115kV supplied station, is no longer required and will be retired. The station will be replaced by a new Hydro Ottawa owned station to serve Hydro Ottawa's load. This new station is scheduled to be in-service in 2027. Included also as part of the recommendation is the conversion of Orleans TS to a 230kV DESN and the construction of a new 230kV circuit. The decommission of Bilberry and load transfer to the new Mer Bleue station to 230kV supply will also help preserve capacity on the 115kV system which is nearing its limit.

Asset renewal need:

- Russell TS: The two 45/60/75 MVA transformers T1 and T2 were installed in 1975 and 1971 respectively and they need to be replaced. Project for replacement of transformers T1/T2 is underway and is being led by Hydro One in coordination with Hydro Ottawa. The transformers will be upgraded with 60/80/100MVA units. The planned in-service date of project is 2027.

- Albion TS: The existing transformers T1 and T2 are rated at 75MVA each, were built in the 1970s, and have been identified for replacement with new closest standard size 60/80/100 MVA units. All existing Hydro One owned circuit breakers will be replaced with breakers of similar rating. The planned in-service date of project is in 2031.

- S7M Line refurbishment: The 115 kV circuit, spread across several S7M line sections totaling 6.5 km, have been identified at or near their end of service life. It was suggested to replace conductors, wood poles, insulators, and other components. Some sections are considered for upgrades, which Hydro Ottawa, Hydro One, and IESO are working together to determine the preferred plan. Once selected, the plan is expected to start in the near term over the next five years.

- South March TS: The station has two 230kV/44kV, 50/67/83MVA transformers that were in-serviced in 1971 and based on their asset condition need replacement. Technical Working Group is reviewing if the transformers should be replaced with similar 50/67/83MVA units or if the size should be upgraded to 75/100/125MVA units. Based on the forecast, the station capacity is expected to be reached by 2027 for both summer and winter. Hydro Ottawa, Hydro One Distribution and Hydro One Transmission will work together to determine the appropriate timing for the replacement and upgrade.

- Lisgar TS: There are two T1/T2 115kV/13.8kV, 45/60/75MVA transformers at the station. Transformer T1 was in-serviced in 1974 and based on its asset condition it needs replacement. Based on the non-coincident forecast, the station has reached its capacity under summer forecast and is expected to reach capacity in 2027 under the winter forecast. The TWG has reviewed whether the transformer should be replaced with a 45/60/75MVA unit or upgraded to 60/80/100MVA unit. To increase the station transformation capacity, it was determined to upgrade T1 and the LV circuit breakers and LV cables, and to review the need for T2 upgrade. Hydro Ottawa and Hydro One will work together to coordinate the upgrade at the station and the work is expected to start in the short term.

- Riverdale TS: this is a 115/13.8kV station connected to 115kV circuits A3RM, A5RK, and A6R. The 115kV breakers are identified to be replaced based on asset condition assessment. The planned in-service date of the project is in 2038.

The currently ongoing IESO led Integrated Regional Resource Plan has identified additional needs listed below. As indicated above, the anticipated demand growth is very high compared to the previous cycle. As part of the IRRP study, the working group is assessing non-wire options such as CDM measure and BESS to help meet this demand. The needs listed below are expected to require wire options in addition to non-wire options where feasible.

- Kanata-Stittsville Transformation Capacity. The area was identified as requiring additional transformation capacity in the previous cycle of regional planning which could be mitigated in the short term through load transfer. The recommendation also considered the then ongoing IESO bulk study, which could impact the area supply, before developing a plan for the area. The need was further reviewed during this ongoing cycle of regional planning, and the expected recommendation is a new transformer station and new 230kV transmission circuit in the Kanata area. Based on the forecast, transformation capacity has reached its summer supply limit and is also expected to reach its winter limit by 2026. Plan to upgrade the area is expected to start in the near term with Hydro Ottawa planning to energize the new station in late 2028.

- Downtown Ottawa Transformation Capacity. Several stations in the downtown core are expected to or have reached their capacity based on the forecast. To address this, several recommendations are expected from this cycle of regional planning:
    - Upgrade Bronson MS to a transmission connected station with higher rated transformers. This will provide additional transformation capacity in the city center. The project is expected to be in-service in 2031.
    - Upgrade King Edward TS: Replace aging and limiting circuit breakers and cables at the station to increase the available transformation capacity. Based on forecast, the station capacity is expected to be reached in 2037 in summer, and 2026 in winter.
    - Upgrade Carling TS: Replace limiting cables at the station to increase the available transformation capacity. Based on the forecast, the station capacity is expected to be reached in 2028 in summer, and 2029 in winter.

- West Ottawa transformation: The area directly west of Merivale TS, supplied by Manordale MTS and Center Point MTS, is predominantly supplied by 8kV distribution system. Hydro Ottawa has received some large-scale customer load requests coupled with the transformation capacity being exceeded at nearly all the stations in the area has resulted in a need being identified for new 230kV-28kV station in the short term. Options were reviewed during IRRP, and the expected recommendation is the following
    - Build a new 230kV station in the Greenbank Rd area. Connection of the station would be to circuit E34M and would require a new 230kV circuit from Merivale TS, a distance of approximately 4km. This new transmission line could also be used for further development in the city's west end.

- Cyrville MTS: The 115kV supplied station is expected to have large load increase. Given the station location near 230kV supplies, the TWG as part of the IRRP is proposing to upgrade the station transformation capacity and change its supply to 230kV. This will allow the station to meet its load forecast as well provide relief to other stations through distribution transfers. This conversion to 230kV supply will also help preserve capacity on the 115kV system which is nearing its limit. This plan will start in the near term with targeted energization in 2027.

- Moulton MTS: The existing Cyrville MTS 115kV transformers will be relocated to Moulton MTS to increase the station transformation capacity. This plan will start in the near term with targeted energization in 2027-2029.

- Upgrades to 115kV circuits. Several circuits have been identified as reaching their capacity over the study period. It is expected this cycle of RP will recommend upgrades sections of F10MV, C7BM, M4G, M5G. Upgrade would be required in the mid-term based on the winter forecast.

Capital contribution is expected by Hydro One Networks Inc. from Hydro Ottawa for some of the projects recommended through the regional planning in the Greater Ottawa Region.

Hydro One Networks Inc. would like to acknowledge and thank you for your work and effort in support of the Regional Planning process. We look forward to continuing to work with you in the future. If you have any further questions, please feel free to contact me.

Sincerely,

Ajay Garg,
Senior Manager, System Planning & Regional Planning Coordination

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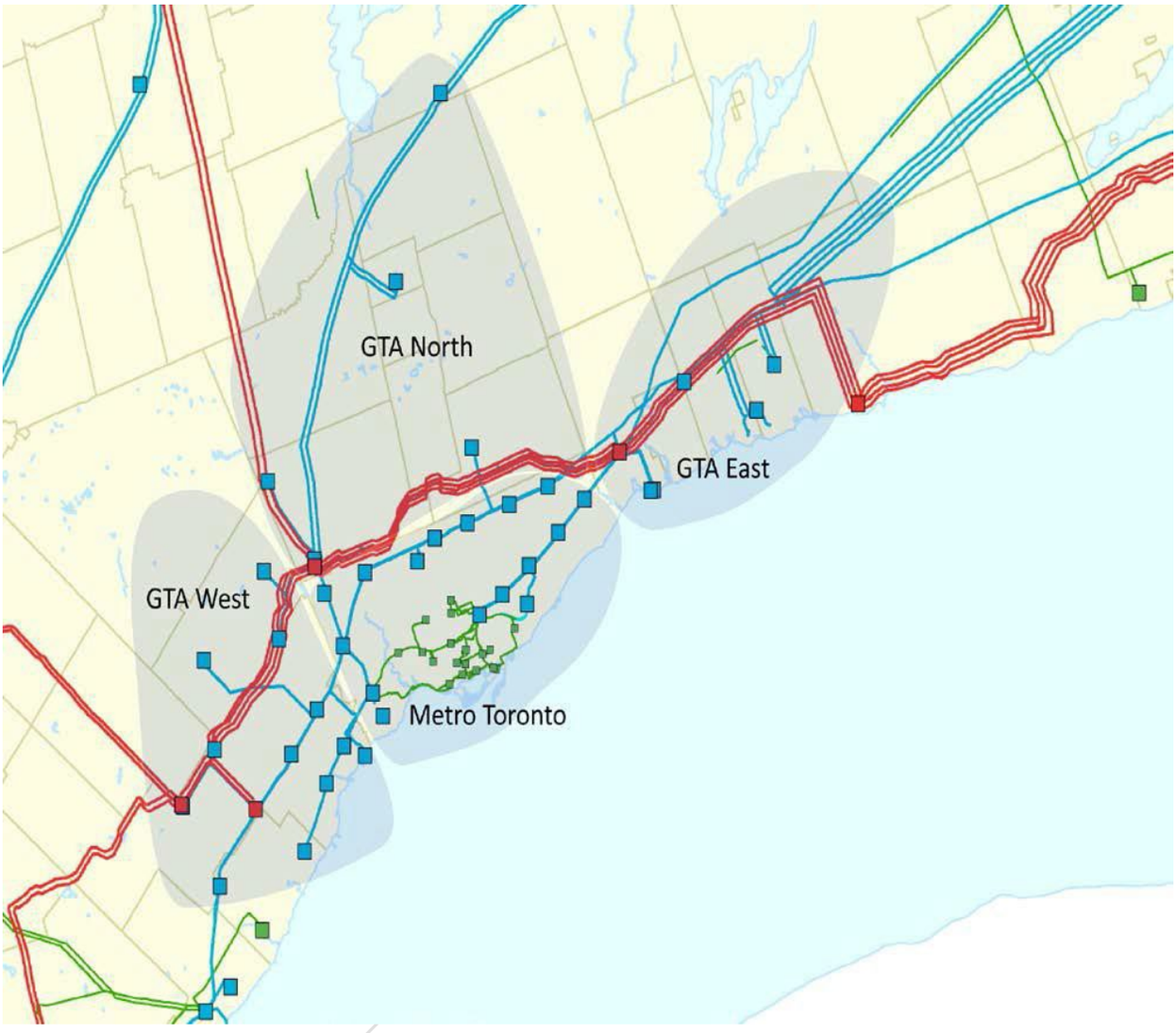
Appendix A: Map of Ontario's Planning Regions

Northern Ontario

Southern Ontario

Greater Toronto Area (GTA)



Appendix B: List of LDCs for Each Region

[Hydro One as Upstream Transmitter]

Region	LDCs
1. Burlington to Nanticoke	• Burlington Hydro Inc. • GrandBridge Energy Inc. (Formerly Energy+ and Brantford Power) • Alectra Utilities Corporation (Formerly Horizon Utilities Inc.) • Hydro One Networks Inc. (Distribution) • Oakville Hydro Electricity Distribution Inc.
2. Greater Ottawa	• Hydro 2000 Inc. • Hydro Ottawa Limited • Hydro Hawkesbury Inc. • Ottawa River Power Corporation • Hydro One Networks Inc. (Distribution) • Renfrew Hydro Inc
3. GTA North	• Alectra Utilities Co. • Hydro One Networks Inc. (Distribution) • Newmarket-Tay Power Distribution Ltd. • Toronto Hydro Electric System Limited
4. GTA West	• Burlington Hydro Inc. • Hydro One Networks Inc. (Distribution) • Alectra Utilities Co. • Milton Hydro Distribution Inc. • Halton Hills Hydro Inc. • Oakville Hydro Electricity Distribution Inc.
5. Kitchener- Waterloo-Cambridge-Guelph (“KWCG”)	• Alectra Utilities Corporation. • Enova Power Corporation. • Grandbridge Energy Inc. • Centre Wellington Hydro Ltd. • Hydro One Networks Inc. (Distribution) • Halton Hills Hydro Inc. • Wellington North Power Inc.

6. Toronto	• Alectra Utilities • Elexicon Energy Inc. • Hydro One Networks Inc. (Distribution) • Toronto Hydro Electric System Limited
7. Northwest Ontario	• Atikokan Hydro Inc. • Fort Frances Power Corporation • Hydro One Networks Inc. (Distribution) • Synergy North • Sioux Lookout Hydro Inc.
8. Windsor-Essex	• E.L.K. Energy Inc. • Entegrus Powerlines Inc. (Chatham-Kent) • EnWin Utilities Ltd. • Essex Powerlines Corporation • Hydro One Networks Inc. (Distribution)
9. East Lake Superior [Hydro One Sault Ste. Marie L.P. is the Lead Transmitter for the region]	• Algoma Power Inc. • Hydro One Networks Inc. (Distribution) • PUC Distribution
10. GTA East	• Elexicon Energy Inc. • Oshawa PUC Networks Inc. • Hydro One Networks Inc. (Distribution)
11. London Area	• Entegrus Powerlines Inc. • ERTH Power Inc. • Hydro One Networks Inc. (Distribution) • London Hydro Inc. • Tillsonburg Hydro Inc.

12. Peterborough to Kingston	• Eastern Ontario Power Inc. • Elexicon Energy Inc. • Hydro One Networks Inc. (Distribution) • Kingston Hydro Corporation • Lakefront Utilities Inc.
13. South Georgian Bay/Muskoka	• Hydro One Networks Inc. (Distribution) • Alectra Utilities • InnPower • Orangeville Hydro • Elexicon Energy • Lakeland Power • EPCOR Electricity Dist. Ontario Inc. • Newmarket-Tay Power Distribution Ltd. • Wasaga Distribution Inc.
14. Sudbury/Algoma	• Greater Sudbury Hydro Inc. • North Bay Hydro • Hydro One Networks Inc. (Distribution)
15. Chatham-Kent/Lambton/Sarnia	• Bluewater Power Distribution Corporation • Entegrus Power Lines Inc. (Chatham-Kent) • Hydro One Networks Inc. (Distribution)
16. Greater Bruce/Huron	• Entegrus Powerlines Inc. • ERTH Power Corporation • Hydro One Networks Inc. (Distribution) • Festival Hydro Inc. • Wellington North Power Inc. • Westario Power Inc.

17. Niagara	• Canadian Niagara Power Inc. [Port Colborne] • Hydro One Networks Inc. (Distribution) • Grimsby Power Inc. • Niagara Peninsula Energy Inc. • Niagara-On-The-Lake Hydro Inc. • Alectra Utilities Co. • Welland Hydro-Electric System Corporation
18. North of Moosonee [Five Nations Energy Inc (FNEI) is the Lead Transmitter for the region]	• Distribution in this region is provided by FNEI
19. North/East of Sudbury	• Northern Ontario Wires Inc. • Hearst Power Distribution Company Limited • North Bay Hydro Distribution Ltd. • Hydro One Networks Inc. (Distribution) • Greater Sudbury Hydro Inc.
20. Renfrew	• Hydro One Networks Inc. (Distribution) • Ottawa River Power Corporation
21. St. Lawrence	• Cooperative Hydro Embrun Inc. • Hydro One Networks Inc. (Distribution) • Rideau St. Lawrence Distribution Inc.

PERFORMANCE MEASUREMENT FOR CONTINUOUS IMPROVEMENT

1. OVERVIEW

Hydro Ottawa's performance measurement framework, outlined within this document, is designed with a strong focus on customer-centric outcomes, guiding strategic planning, capital investments, and core operations. Aligned with the OEB's four key performance outcomes, detailed below, the framework ensures comprehensive performance tracking. Building on this foundation, the 2026-2030 Distribution System Plan (DSP) introduces an enhanced performance framework, emphasizing data-driven decision-making to ensure the delivery of reliable and sustainable electricity services.

2. INTRODUCTION

Hydro Ottawa has developed a comprehensive performance measurement framework that monitors outcomes and continuous improvement in service delivery. This framework, which prioritizes customer-centric outcomes, guides Hydro Ottawa's strategic planning, capital investments, and core operations, which aligns with the OEB *Renewed Regulatory Framework for Electricity Distributors: A Performance Based Approach,*[1] as well as the OEB's *2016 Handbook for Utility Rate Applications*.[2] Further details regarding Hydro Ottawa's Capital Investment Planning Process can be found in Section 5.3 of Schedule 2-5-4 - Asset Management Process.

Furthermore, Hydro Ottawa's plan incorporates all four key performance outcomes identified by the OEB:

- **Customer Focus:** services are provided in a manner that responds to identified customer preferences

[1] Ontario Energy Board, *Report of the Board - Renewed Regulatory Framework for Electricity Distributors: A Performance Based Approach* (October 18, 2012).
[2] Ontario Energy Board, *Handbook for Utility Rate Applications* (October 13, 2016).

- **Operational Effectiveness:** continuous improvement in productivity and cost performance is achieved; and utilities deliver on system reliability and quality objectives;
- **Public Policy Responsiveness:** utilities deliver on obligations mandated by government (e.g., in legislation and in regulatory requirements imposed further to Ministerial directives to the OEB);
- **Financial Performance:** financial viability is maintained; and savings from operational effectiveness are sustainable.

Hydro Ottawa maintains a steadfast commitment to these performance outcomes and diligently monitors its performance. This monitoring is facilitated through a multi-pronged approach consisting of the following:

- **Service Quality Requirements (SQR):** A comprehensive record of historical performance in respect to Service Quality Requirements, as defined in Chapter 7 of the Distribution System Code, as well Service Reliability Indicators are detailed in Excel Attachment 2-5-3 (A) - OEB Appendix 2-G - Service Quality and Reliability Indicators.
- **Electricity Utility Scorecard**: Submitted annually to the OEB to promote transparency and accountability in Ontario's electricity distribution sector, this scorecard tracks key indicators for all distributors, enables comparisons and highlights areas for improvement. The scorecard empowers customers with information about service quality and value, while also informing regulatory oversight and encouraging continuous improvement across the industry. Refer to Attachment 1-3-3(C) - Electricity Utility Scorecard for more details.
- **Custom Incentive Rate (CIR) Report:** This is an annual report submitted to the OEB under the OEB's Decision and Order on Hydro Ottawa's 2021-2025 Custom IR Application,[3] detailing:
    - Capital expenditure performance, including variance analysis and program progress across the four investment categories: system access, system service, system renewal, and general plant.

[3] Ontario Energy Board, *Decision and Order* EB-2019-0261 (November 19, 2020).

- Continuous improvement tracking via Key Performance Indicators (KPIs) specifically designed to enhance operational effectiveness in safety, system reliability, asset management, and cost control. These KPIs fulfill commitments made during the 2021-2025 CIR setting process (EB-2019-0261) and augment existing OEB reporting metrics.
- Performance Outcomes Accountability Mechanism (POAM) reporting, which tracks progress against targets established in Hydro Ottawa's 2021-2025 Approved Settlement Agreement.[4]

Hydro Ottawa's 2026-2030 DSP introduces a performance framework, detailed in Section 6, that prioritizes data-driven decision-making to ensure the delivery of reliable and sustainable electricity services. This framework represents an evolution from previous iterations, leveraging historical performance data and KPIs to inform decisions, drive continuous improvement, and guide investment priorities. This evolution is driven by Hydro Ottawa's transition to a risk-based asset management approach and advancements in data analytics capabilities, enabling a more accurate approach to performance monitoring at the Material Investment Plan (MIP) level.

3. HISTORIC (2021-2025) DSP PERFORMANCE

Hydro Ottawa's 2021-2025 DSP established KPIs to assess and enhance performance across four critical areas: Customer Oriented Performance, Cost Efficiency & Effectiveness, Asset Performance, and System Operations Performance. The KPIs aligned with Hydro Ottawa's Asset Management Objectives, which directly support the organization's Corporate Strategic Objectives.

Utilizing these metrics, Hydro Ottawa monitored the efficacy of its planning processes, identified operational efficiencies and areas for improvement, and evaluated overall performance. This section presents the historical KPI data and explains the results.

[4] Hydro Ottawa Limited, *2021-2025 Custom Incentive Rate-Setting Approved Settlement Agreement*, EB-2019-0261 (September 18, 2020).

Table 1 below provides a categorized overview of the KPIs, aligning them with the corresponding Asset Management Objective and Sub-Category. Furthermore, the table directs the reader to the relevant sections containing detailed descriptions and historical performance data for each KPI.

1 **Table 1 - 2021-2025 DSP KPIs by Category and Asset Management Objective**

Category	Asset Management Objective	Sub-Category	KPIs
3.1. Customer Oriented Performance	Levels of Service	3.1.1. Customer Engagement	○ Customer Satisfaction ○ Staff Knowledge ○ Staff Courtesy ○ First Call Resolution ○ Residential & Small Commercial Satisfaction ○ Commercial Satisfaction ○ Staff Helpfulness ○ Value for Money ○ Customer Loyalty
		3.1.2. System Reliability	○ System Average Interruption Frequency Index (SAIFI) ○ System Average Interruption Duration Index (SAIDI) ○ Customer Average Interruption Duration Index (CAIDI) ○ Feeders Experiencing Multiple Sustained Interruptions (FEMI)
		3.1.3. System Power Quality	○ System Average Root Mean Square Variation Frequency Index (SARFI)
3.2. Cost Efficiency & Effectiveness	Compliance	3.2.1 Distribution System Plan Implementation Progress	○ Cost Efficiency
	Resource Efficiency	3.2.2 Labour Utilization	○ Productive Time ○ Labour Allocation
3.3. Asset Performance	Asset Value	3.3.1 Equipment Failure Contribution to SAIFI	○ System Average Interruption Frequency Index – Defective Equipment ($SAIFI_{DE}$)
	Health, Safety & Environment	3.3.2 Public Safety Concerns	○ Public Safety Concerns (PSC)
		3.3.3 Oil Spilled	○ Litres Annual Oil Spilled ○ Cost of Annual Oil Remediation
3.4. System Operations Performance	Levels of Service	3.4.1 Stations Capacity	○ Stations Exceeding Planning Capacity ○ Stations Approaching Rated Capacity
		3.4.2 Feeder Capacity	○ Feeders Exceeding Planning Capacity ○ Feeders Approaching Rated Capacity
		3.4.3 System Losses	○ Losses

Service Quality Requirements

As per Chapter 7 of the OEB's Distribution System Code and Section 2.1.4 of the OEB's Electricity Reporting and Record Keeping Requirements (RRRs), Hydro Ottawa maintains and reports on Service Quality Requirements (SQRs). The SQRs for the last five historical years are included in Excel Attachment 2-5-3(A) - OEB Appendix 2-G - Service Quality and Reliability Indicators.

Hydro Ottawa met all OEB Targets in its SQRs for the last five years, with the exception of "Rescheduling a Missed Appointment" in 2023. Hydro Ottawa experienced an 84-day labour strike from June through September of 2023. During this period, scheduled appointments were cancelled, and customers were notified via email of the cancellations. Hydro Ottawa rescheduled those appointments when regular business operations resumed after the strike, and thus they were not rescheduled within one business day of the cancellation as per Section 7.5.1 of the Distribution System Code.

Other Appointment-related SQRs were also lower in 2023 than Hydro Ottawa's typical performance due to the strike - namely "Appointments Met" and "Appointment Scheduling". However, these as well as all other SQR targets were met in 2023. Hydro Ottawa expects its SQRs related to Appointments to return to normal levels in 2024.

Hydro Ottawa's service territory is a mix of urban and rural, with more than 50% of Hydro Ottawa's service territory considered rural. The administrative complexity of capturing urban and rural response rates, relative to Hydro Ottawa's emergency response rate performance overall, is not cost effective or insightful for Hydro Ottawa. Rather, Hydro Ottawa strives to adhere to the urban emergency response rate (60 minutes opposed to 120 minutes for rural) for both rural and urban customers. Hydro Ottawa notes that in 2023, its Urban Response time shows a downward trend. This is largely attributed to the Freezing Rain and a subsequent Loss of Supply event that took place in April 2023, as described in Section 4.4 below.

Hydro Ottawa confirms that the SQRs as filed in Appendix 2-G are consistent with those SQRs that appear on the Electricity Utility Scorecard.

The following sections detail Hydro Ottawa's performance as laid out in Table 1 above.

3.1. CUSTOMER ORIENTED PERFORMANCE

Hydro Ottawa's KPIs surrounding Customer Oriented Performance align with the asset management objective for Levels of Service, which in the 2021-2025 DSP was defined as "*to maintain and enhance leading performance of the distribution system through improving electrical service and alignment with customers' expectations.*" Specifically, Hydro Ottawa continuously seeks feedback from customers on their satisfaction with the services provided by the utility. The customer satisfaction levels are greatly impacted by the distribution system's service reliability which is integral to all work undertaken as part of system planning. Hydro Ottawa continually assesses system reliability, and where gaps are found, implements appropriate actions to address the issues.

Hydro Ottawa regularly engages with its customers to inform the utility's planning, strategy and decision making. Full details on Hydro Ottawa's ongoing customer engagement efforts can be found in Schedule 1-4-1 - Customer Engagement Ongoing, while details related to the customer engagement undertaken specific to this Application are available in Schedule 1-4-2 - Customer Engagement on the 2026-2030 Application.

3.1.1. Customer Engagement

Hydro Ottawa conducts customer engagement surveys to inform KPIs and drive service improvements. The feedback collected through these surveys provides valuable insights that are used to identify areas for service improvement and enhancement. Two surveys contribute to this process:

- **Annual Electric Utility Customer Satisfaction Survey:**[5] Details regarding this annual survey are available in Section 2.1.1.1 of Schedule 1-4-1 - Customer Engagement Ongoing.

[5] Previously referred to as the "Customer Satisfaction Survey (SIMUL Survey)" in the 2021-2025 DSP.

- **Contact Centre Satisfaction Survey:**[6] Details regarding this survey are available in Section 2.1.2.1 of Schedule 1-4-1 - Customer Engagement Ongoing.

The KPI results over the past five years are presented in Table 2 and Table 3.

Table 2 - Annual Electric Utility Customer Satisfaction Survey

KPI	Target	2019	2020	2021	2022	2023
Customer Satisfaction: Residential & Small Commercial	≥90%	95%	96%	94%	93%	91%
Customer Satisfaction: Large Commercial	≥90%	96%	N/A	N/A	94%	N/A
Staff Helpfulness	≥80%	78%	59%	69%	74%	78%
Value for Money	Result	77%	80%	74%	73%	73%
	Target[7]	77%	82%	74%	73%	74%
Customer Loyalty	Result	50%	51%	43%	47%	48%
	Target[7]	45%	51%	46%	38%	50%

Descriptions of these measures are as follows:

- Customer Satisfaction: measures overall customer satisfaction at the start of the survey;
- Staff Helpfulness: based on a small sample of customers who said they contacted Hydro Ottawa, describes whether a customers' recent concern was addressed in a manner that was useful, providing a solution to the customers' problem. This metric is based on a limited sample of customer contacts and, as such, may not be representative of overall customer experiences.
- Value for Money: Measures perceptions about service quality and value, and is linked to the utility's overall image;
- Customer Loyalty: Measures the degree to which customers are satisfied, would continue to do business with Hydro Ottawa if given a choice, and would recommend Hydro Ottawa to others

[6] Previously referred to as the "TouchLogic Survey" in the 2021-2025 DSP.
[7] The Hydro Ottawa target is defined to be 2% better than Ontario Average.

Table 3 - Contact Centre Satisfaction

KPI	Target	2019	2020	2021	2022	2023
Call Center Customer Satisfaction	≥85%	87%	87%	86%	84%	85%
Staff Knowledge	≥90%	88%	88%	88%	86%	87%
Staff Courtesy	≥90%	87%	88%	87%	86%	87%
First Call Resolution	≥85%	89%	90%	89%	86%	86%

Descriptions of these measures are as follows:

- Customer Satisfaction – the customer's overall level of satisfaction with the call;
- Staff Knowledge – the customer's assessment of the knowledge of the contact centre staff;
- Staff Courtesy – the customer's assessment of the courtesy of the contact centre staff; and
- First Call Resolution – the ability of the staff to deal with the customer's issue.

Hydro Ottawa notes that the Customer Engagement KPIs are used in combination with other ongoing customer engagement activities as described in Schedule 1-4-1 - Customer Engagement Ongoing to assess customers expectations and experiences.

3.1.2. System Reliability

Hydro Ottawa tracks system reliability performance using four indicators: System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI), Customer Average Interruption Duration Index (CAIDI) and Feeders Experiencing Multiple Sustained Interruptions (FEMI). Historical reliability performance is comprehensively detailed in Section 4 below. Hydro Ottawa confirms that the data presented in Appendix 2-G regarding SAIDI and SAIFI is consistent with the OEB's Electricity Utility Scorecard.[8] This data is included in this Application as Excel Attachment 2-5-3(A) - OEB Appendix 2-G - Service Quality and Reliability Indicators.

[8] Noting that the OEB Scorecard presents SAIDI and SAIFI excluding LOS and MEDs.

3.1.2.1. System Average Interruption Frequency (SAIFI)

This information is comprehensively detailed in Section 4.1.

3.1.2.2. System Average Interruption Duration Index (SAIDI)

This information is comprehensively detailed in Section 4.2.

3.1.2.3. Customer Average Interruption Duration Index (CAIDI)

This index, representing the average time required to restore power per sustained interruption, is defined as follows:

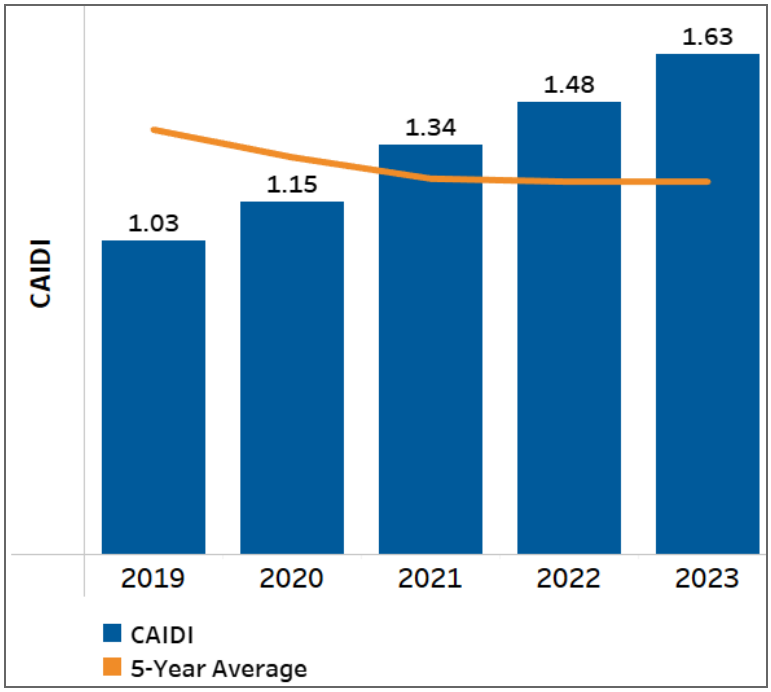
$$CAIDI = \frac{SAIDI}{SAIFI} = \frac{Total\ hours\ of\ customer\ interruptions}{Total\ number\ of\ customer\ interruptions}$$

CAIDI is reported excluding Loss of Supply (LOS) and Major Event Days (MEDs). Please see Table 4 and Figure 1 for the historical results.

Table 4 - CAIDI Reliability Performance

Metric		2019	2020	2021	2022	2023
CAIDI	Excluding LoS & MED	1.03	1.15	1.34	1.48	1.63
	5- Year Historical Average	1.39	1.30	1.23	1.22	1.22

Figure 1 - CAIDI Reliability Performance



Hydro Ottawa monitors the annual trend of CAIDI performance to identify and evaluate potential concerns with restoration efforts. The CAIDI metric exceeded the 5-year historical average for 2022 and 2023 due to the increasing trend of total hours of customer interruptions (SAIDI) and reducing trend of total number of customer interruptions (SAIFI). For analysis of SAIDI and SAIFI refer to Sections 4.1 System Average Interruption Frequency Index (SAIFI) and 4.2 System Average Interruption Duration Index (SAIDI).

3.1.2.4. Feeders Experiencing Multiple Sustained Interruptions (FEMIn)

This index quantifies the number of feeders experiencing sustained interruptions (exceeding one minute in duration) greater than or equal to a value n. Current reporting utilizes n=10, signifying the count of feeders experiencing ten or more sustained interruptions. Hydro Ottawa's performance target is to maintain a $FEMI_{10}$ value less than or equal to 10.

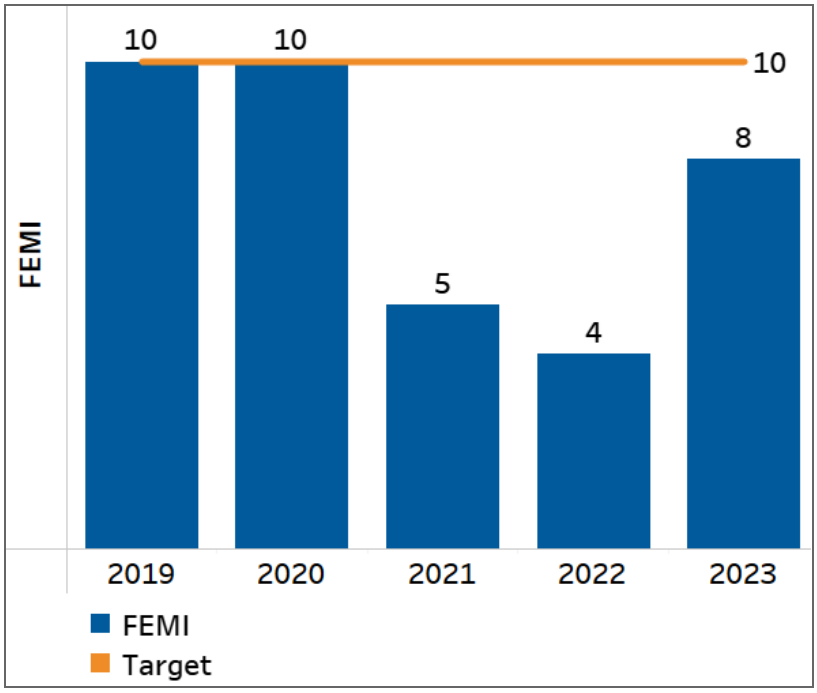
FEMI serves as a customer-centric metric, providing insights into regional variations in service quality. To ensure accuracy and relevance, $FEMI_{10}$ reporting excludes Scheduled Outages, LOS, and MEDs. This exclusion allows for a more focused analysis of system performance and its impact on customers.

Table 5 and Figure 2 show the historical system performance for FEMI.

Table 5 - FEMI Reliability Performance

Metric	Target	2019	2020	2021	2022	2023
$FEMI_{10}$	10	10	10	5	4	8

Figure 2 - FEMI Reliability Performance



Hydro Ottawa achieved its targets for FEMI between the 2019-2023 period. Hydro Ottawa tracks and evaluates feeders that affect the performance of the FEMI metric monthly to identify projects to

improve the reliability of these parts of the distribution system. Hydro Ottawa will continue to evaluate the performance of feeders that appear in the FEMI metric to ensure customer reliability is maintained.

3.1.3. System Power Quality

Hydro Ottawa monitors the quality of power supplied to its customers to ensure adherence to service levels outlined in CSA document CAN3-C235-83 for steady-state conditions. With increasing sensitivity of customer equipment to voltage fluctuations, monitoring power quality is a critical aspect of service delivery. To assess power quality, Hydro Ottawa utilizes the System Average Root Mean Square (RMS) Variation Frequency Index (SARFI). This industry-standard metric measures the average number of voltage sags or swells on the system, excluding events originating from the transmission system or third parties.

Hydro Ottawa endeavors to maintain system voltage within ±6% of nominal levels, ensuring compliance with the Information Technology Industry Council (ITIC) curve for acceptable voltage limits. Hydro Ottawa's SARFI performance outcomes for the 2019-2023 period are presented in Table 6, while the 2023 SARFI performance is shown in Figure 3.

Figure 3 - 2023 Power Quality Events ITIC Curve

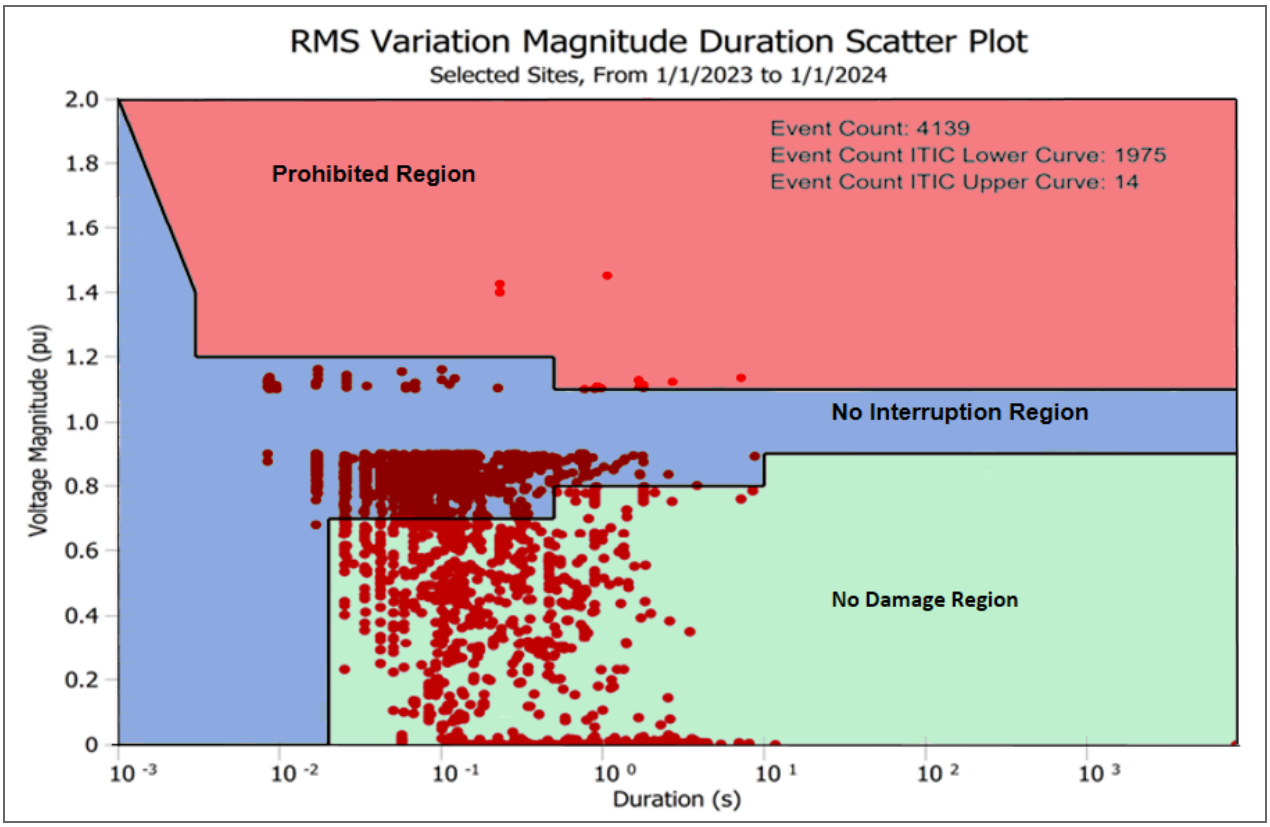


Table 6 - SARFI Performance

Metric	2019	2020	2021	2022	2023
SARFI	10	21	11	20	14

Hydro Ottawa saw SARFI values higher than the 5-year average in 2020 and 2022 due to supply voltage swings upstream (from the transmitter) resulting in a voltage swell event for a short duration until the station transformer tap changer could operate. As illustrated in Figure 4, Hydro Ottawa recorded 4,139 events in 2023, of which 14 fell within the prohibited region of the ITIC curve, with six events caused by Hydro One Networks Inc. (Hydro One) with their tap changer operation/voltage regulation and the remaining attributed to transient fault events on Hydro Ottawa's system. Each year, Hydro Ottawa diligently tracks and monitors SARFI events to identify and

address any areas of concern, ensuring that power quality remains within acceptable limits for all customers.

3.2. COST EFFICIENCY & EFFECTIVENESS

Hydro Ottawa conducts annual assessments of its cost efficiency and labour utilization KPIs. This evaluation provides critical insights into the progress, efficiency, and effectiveness of the company's planning processes, as well as the efficiency of plan execution, and supports a continuous improvement framework, data-driven decision-making and operational optimization.

3.2.1. Distribution System Plan Implementation Progress[9]

The Distribution System Plan Implementation Progress (DSP Implementation Progress) KPI measures and reports on the progress of capital projects identified within Hydro Ottawa's DSP. This KPI ensures the company delivers maximum value to its customers by demonstrating the effective execution of essential capital projects necessary for the continued reliable operation of the electricity distribution system. This KPI is publicly reported on the Hydro Ottawa Electric Utility Scorecard under the Asset Management Performance Category and is titled "Distribution System Plan Implementation Progress." Refer to Attachment 1-3-3(C) - Electricity Utility Scorecard Analysis for details.

DSP Implementation Progress tracking focuses on planned capital projects categorized as either system renewal or system service investments. This KPI excludes system access projects, general plant expenditures, and all emergency work. It is calculated as the ratio of the allocated budget for planned capital activities to the actual expenditures incurred annually. The specific formula employed in this calculation is provided below.

$$DSP\ Implementation\ Progress\ (\%) = \frac{Actual\ SS\ \&\ SR\ Expenditures}{Budgeted\ SS\ \&\ SR\ Expenditures} \times 100$$

[9] Previously referred to as “Cost Efficiency" in the 2021-2025 DSP.

The budget and execution of planned capital projects is rigorously managed through Hydro Ottawa's financial system. Any deviations from the projected budget necessitate a formal change request, subject to approval on a case-by-case basis. The target for the DSP Implementation Progress KPI is to achieve 100% completion of the annual planned work within the approved budget. The KPI trend is presented in Table 7.

Table 7 - Distribution System Plan Implementation Progress

KPI	Target	2019	2020	2021	2022	2023
DSP Implementation Progress	100 %	84%	89%	92%	90%	75%

Between 2019 and 2023, inclusive, Hydro Ottawa faced challenges in achieving its target. These challenges were primarily attributed to external factors outside of Hydro Ottawa's direct control, as detailed below.

In 2019, the DSP Implementation Progress was 84%, falling short of the target due to the financial impact of three significant storms in 2018, which necessitated increased spending on emergency repairs and station projects. These reactive investment needs led to a reduction in planned expenditures for 2019 and 2020.

The 2020 DSP Implementation Progress reached 89%. However, the COVID-19 pandemic caused disruptions, requiring deferral of planned work to 2021 in order to accommodate emergency tasks, outage restrictions and constrained labour availability.

In 2021, Hydro Ottawa achieved a 92% DSP Implementation Progress despite the ongoing challenges posed by the COVID-19 pandemic. However, the target of 100% completion remained unmet due to project deferrals necessitated by persistent labor and material shortages, as well as outage restrictions.

In 2022, the DSP Implementation Progress decreased to 90%. This was attributed to project deferrals necessitated by emergency restoration work following severe storms one of which being the Derecho, compounded by ongoing labour and material availability challenges.

The year 2023 saw a significant drop in the DSP Implementation Progress to 75%. This was primarily attributed to an 84-day labour strike, which posed a major obstacle, causing delays across all planned programs. This disruption necessitated re-prioritization efforts and deferral of projects to 2024.

3.2.2. Labour Utilization

Hydro Ottawa conducts annual assessments of its labour utilization KPIs to monitor and report on the progress, efficiency, and effectiveness of plan execution, while also identifying areas for continuous improvement. This practice enables Hydro Ottawa to demonstrate efficient resource allocation and responsible stewardship.

To evaluate labour utilization performance, Hydro Ottawa tracks productive time and labour allocation KPIs. This data-driven approach facilitates ongoing optimization of workforce deployment and operational efficiency.

3.2.2.1. Productive Time

Productive time is defined as the ratio of total regular hours charged to a work order (billable) to the total regular hours available per year. The formula for calculating productive time is as follows:

$$Productive\ Time\ = \frac{Percent\ of\ Billable\ Hours}{Total\ Regular\ Hours}$$

It is important to note that this KPI is influenced by hours allocated for training, vacation, and sick time. Additionally, it does not account for work completed using overtime. Table 8 presents the trend

in productive time over the past five years. This historical data provides valuable context for evaluating current performance and identifying opportunities for improvement.

Table 8 - Productive Time

KPI	2019	2020	2021	2022	2023
ProductiveTime	72%	69%	73%	69%	73%
Target	≥74%	≥74%	≥72%	≥72%	≥73%

Hydro Ottawa's productivity time performance between 2019 and 2023 has fluctuated relative to its established targets.

In 2019, a 72% productivity time was achieved, slightly below the 74% target but consistent with the previous year's performance. This minor shortfall was partly attributed to over 3,000 hours dedicated to an administrative work order associated with the company's relocation to new offices, Dibblee and Hunt Club.

The year 2020 saw a productivity time of 69%, not meeting the 74% target and the previous year's performance. This was primarily due to COVID-19 related downtime, implemented to facilitate social distancing measures in the second quarter.

In 2021, a 73% productivity time was achieved, meeting the target.

The year 2022 saw a productivity time of 69%, falling short of the 72% target. Analysis indicates that the observed deviation in the 2022 productivity rate is primarily attributable to a significant increase in non-productive time allocation following the relaxation of COVID-19 related restrictions. Specifically, training activities, deemed essential for staff recertifications and other required skill development, consumed 4,700 hours. Additionally, meeting attendance, including the first all-employee forum since 2019, required 700 hours. These increased allocations of time to

non-productive activities consequently decreased the available time for productive work, resulting in the reported shortfall in the productivity rate.

Hydro Ottawa achieved its productivity time target in 2023 with a result of 73%. Notably, the result is calculated based on the number of hours worked, thus the labour strike did not impact the productivity rate for the year.

3.2.2.2. Labour Allocation

Labour allocation is defined as the ratio of labour hours dedicated to maintenance and administrative work versus the total productive time available, as defined in Section 3.2.2.1 above. This KPI aims to quantify the proportion of time spent on operations, maintenance, and administration (OM&A) activities, as outlined in annual work plans, compared to time allocated for capital activities. The formula used in this calculation is provided below:

$$Labour\ Allocation\ = \frac{Percent\ of\ Labour\ Time\ on\ Maintenance\ and\ Administrative\ Activities}{Total\ Productive\ Time}$$

Historically, this metric represented the amount of labour spent on capital activities as a ratio of total regular hours. However, starting in 2020, Hydro Ottawa has modified this metric in order to support broader performance management objectives. Accordingly, the target under the modified metric is to stabilize the amount of labour allocated to maintenance and administrative work. Table 9 presents the trend in this KPI over the previous five years, offering insights into the dynamic relationship between OM&A demands and capital project execution.

Table 9 - Labour Allocation

KPI	2019	2020	2021	2022	2023
Labour Allocation	N/A	37%	29%	35%	35%
Target	N/A	≤ 34%	≤ 33%	≤ 32%	≤ 32%

Hydro Ottawa's performance results for this KPI between 2019 and 2023 are described below.

In 2019, this was the year that this metric was established, resulting in no comparative result for that year.

The year 2020 saw Labour Allocation result of 37%, exceeding the target of 34%. This was attributed to the impact of the COVID-19 pandemic.

In 2021, Hydro Ottawa achieved its target. This success was attributed to a greater allocation of time towards capital projects and improved operational efficiency compared to the previous year, which was significantly impacted by the COVID-19 pandemic.

However, in 2022, the yearly Labour Allocation increased to 35%, exceeding the 32% target. This was primarily due to an increase in non-capital work, both during and after the Derecho storm, which necessitated extensive repair and restoration efforts.

Lastly, in 2023, the yearly Labour Allocation was 35%, again exceeding the 32% target. This was attributed to capital project deferrals caused by the labour disruption which led to an increase in maintenance activities.

3.3. ASSET PERFORMANCE

Hydro Ottawa employs a comprehensive approach to asset performance monitoring, utilizing three key metrics: defective equipment contribution to SAIFI, public safety concern notifications, and oil spill incidents. These metrics collectively enable Hydro Ottawa to effectively achieve its asset management objectives and proactively mitigate risks within the electricity distribution system. This section provides a detailed examination of each metric, explaining their significance in ensuring system reliability, safety, and environmental responsibility.

3.3.1. Equipment Failure[10] Contribution to SAIFI

Hydro Ottawa adopted "Equipment Failure" as the primary cause code, replacing "Defective Equipment", for reliability reporting. This change aligns with the OEB updates to the RRRs. The OEB amended the RRRs in November 2022 to improve interruption reporting detail and usefulness by updating primary and secondary cause codes.[11] Hydro Ottawa implemented the updated primary cause codes on January 1, 2023, and subsequently implemented the updated secondary cause codes on January 1, 2024.

This KPI specifically tracks the contribution of equipment failure outages by asset class to the overall SAIFI (including MEDs) per 100 customers (SAIFI x 100). Hydro Ottawa's target is to achieve year-over-year reductions in customer interruptions caused by equipment failure, employing a rolling average of the previous five years to establish the annual target.

SAIFI, detailed in Section 4.1, serves as a critical metric for Hydro Ottawa in its pursuit of enhancing service levels, optimizing asset value, and improving resource efficiency. By analyzing the contribution of equipment failure outages by asset class to the overall SAIFI, Hydro Ottawa is able to identify assets contributing to multiple outages, allowing for targeted interventions and a more focused approach to addressing issues directly impacting customers.

Each asset class plays a role in the overall SAIFI reliability metric. Table 10 provides a detailed breakdown of each asset class's contribution to the SAIFI x 100 value, facilitating a comprehensive understanding of system performance and areas for potential improvement. The target has been derived from the 2014-2018 average.

[10] Previously referred to as “Defective Equipment " in the 2021-2025 DSP.
[11] Ontario Energy Board, *Notice of Amendments to RRR 2.1.4.2 System Reliability*, EB-2021-0307 (November 21, 2022).

Table 10 - Equipment Failure SAIFI per 100 Customers

Asset – SAIFI x 100	Target	2019	2020	2021	2022	2023
Overhead Assets	10.12	5.20	11.64	9.11	15.73	7.49
Station Assets	1.67	0.35	1.93	0.32	1.25	0.27
Underground Assets	11.16	13.27	11.95	9.26	11.26	4.17

Customer interruptions caused by Overhead and Underground Assets have generally decreased since 2020. The exception was 2022, due to extreme weather events, particularly the Derecho. Through 2019-2023, overhead interruptions were mainly due to the failure of overhead switchgear, transformers and conductors. Underground interruptions were primarily caused by cable and transformer issues, especially leaks. Defective station transformers and switchgear have been the primary contributors to the station equipment trend. The impact of equipment failure to SAIFI underpins the renewal investment needs proposed in Schedule 2-5-7 - System Renewal Investments and the increased maintenance spending outlined in Section 3.1 - Testing, Inspection and Maintenance and Section 3.4 of Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs.

3.3.2. Public Safety Concerns

Hydro Ottawa prioritizes public safety through diligent monitoring and response to Public Safety Concerns identified by the Electrical Safety Authority (ESA). These concerns fall into two categories:

- **Hydro Ottawa's Responsibility:** These are issues directly related to distribution equipment, for which Hydro Ottawa takes full responsibility and ensures prompt resolution.
- **Customer-Related Issues:** These concerns stem from customer actions or inactions that impact the safety of the distribution system, such as exposed wiring or construction near power lines. Hydro Ottawa proactively collaborates with customers to address these issues.

Table 11 presents the annual count of public safety concerns recorded by Hydro Ottawa. Hydro Ottawa diligently responds to and undertakes, where required, corrective actions for all reported public safety concerns, ensuring a continuous improvement cycle focused on enhancing public safety.

Table 11 - Public Safety Concerns

KPI	2019	2020	2021	2022	2023
Public Safety Concerns	2	1	7	9	21

In 2023, a total of 21 Public Safety Concerns were identified, of which six were the sole responsibility of Hydro Ottawa. Analysis of historical data indicates no specific trends in the Public Safety Concerns issued to Hydro Ottawa by the ESA.

While this metric is not a fully reliable indicator for achieving health, safety, and environmental objectives on its own, Hydro Ottawa remains committed to monitoring Public Safety Concerns for emerging trends and taking appropriate corrective actions.

3.3.3. Oil Spilled

The annual oil spilled metric is an essential indicator used by Hydro Ottawa to advance its health, safety, and environmental objectives. This metric enables the company to track both the volume of oil spilled into the environment and the associated annual costs of remediation. By monitoring this data, Hydro Ottawa can identify trends and continuously improve its environmental performance.

Table 12 presents the annual volume of oil spilled into the environment, along with the corresponding remediation costs. Hydro Ottawa's objective is to achieve zero oil spills and eliminate associated cleanup costs.

Table 12 - Annual Oil Spilled

KPI	Target	2019	2020	2021	2022	2023
Oil Spilled (L)	0	1,131 L	954 L	804 L	781 L	1,230 L
Oil Remediation ($000)	0	$ 1,234	$ 1,454	$ 1,897	$ 1,565	$ 1,099

Hydro Ottawa monitors oil spills from both an enterprise risk and company-wide performance perspective. While the ultimate goal is zero spills, the inherent challenges of operating tens of thousands of pieces of oil-filled equipment, essential for electricity delivery, necessitate a pragmatic approach. These assets are exposed to extreme environmental conditions, including winter salt, storms, and other weather events, which can lead to leaks despite robust asset management programs. Hydro Ottawa addresses any leaks immediately upon detection.

During 2023, Hydro Ottawa experienced two significant oil spills, each resulting from contractor activity during excavation. In both cases, contractors struck underground infrastructure, leading to a total spill volume of 390 liters. These two incidents represent the primary cause of the 2023 KPI results deviating drastically from recent historical performance. Aside from these incidents, Hydro Ottawa has observed a general trend/issue with leaking transformers related to a specific manufacturer and certain localized regions. The identified transformers are being phased out through the Cable Replacement program and the Emergency Renewal program as outlined in Section 4 and Section 6 of Schedule 2-5-7 - System Renewal Investments.

To further mitigate the environmental impact of oil spills, Hydro Ottawa implements several proactive measures. These include routine inspections of oil-filled equipment, strategic asset replacement initiatives, and periodic communication with local construction associations emphasizing the critical importance of utilizing locate services before commencing any excavation work. This comprehensive and transparent strategy underscores Hydro Ottawa's commitment to environmental responsibility and sustainable operations.

3.4. SYSTEM OPERATIONS PERFORMANCE

Hydro Ottawa's KPIs surrounding System Operations Performance align with the 2021-2025 DSP Asset Management Objectives for Levels of Service and Asset Value. Specifically, Hydro Ottawa monitors the operational performance of the system by tracking annual levels of station capacity, feeder capacity and system losses. This information is used to identify potential equipment upgrades ensuring that adequate capacity is available during normal system conditions and for reliable operation during system contingency in order to meet the levels of service expected by Hydro Ottawa's customers. In addition, these KPIs allowed the identification of stations and feeders operating above or approaching its design ratings in order to implement the appropriate actions required to maximize the value of the distribution system assets throughout its lifecycle.

3.4.1. Stations Capacity

Hydro Ottawa utilizes Station Capacity KPIs to gain insights into large, medium, and long-term capacity needs, as well as to identify smaller capacity deficits that may be addressed through load transfers. These KPIs include:

- **Station Exceeding Planning Capacity**
- **Station Approaching Rated Capacity**

These KPIs quantify capacity risks by comparing demand to a station's planning and equipment ratings and by determining the potential for stranded load during an N-1 contingency. This comprehensive evaluation framework enables proactive capacity planning and risk mitigation.

3.4.1.1. Stations Exceeding Planning Capacity

This KPI is defined as the percentage of stations with a summer peak operating load exceeding 100% of their planned capacity rating. The calculation for this KPI is provided below.

$$Stations\ Exceeding\ Capacity\ (\%) = \frac{\#\ of\ Stations\ Exceeding\ Planning\ Capacity}{\#\ of\ Total\ Stations} \times 100\%$$

Table 13 - Stations Exceeding Planning Capacity

KPI	Target	2019	2020	2021	2022	2023
SEPC %	≤ 5%	8.8%	13.2%	7.7%	4.3%	8.7%
Count		8	12	7	4	8

Since 2019, the number of stations identified as exceeding their planning capacity has remained relatively stable, as per Table 13, fluctuating with variation in the yearly peak' intensity. With respect to this KPI, there are three key capacity constrained regions: South 28kV, West 28kV and Central 4kV. The energization of Cambrian MTS in the south relieved some south-end capacity concerns in 2022, and the proposed Piperville MTS will alleviate the load further. West-end capacity issues represent the largest concern and the proposed "New Kanata" station is aimed at relieving the constrained West 28kV system. Central 4kV stations continue to approach their planned limits due to transit-oriented development and downtown electrification and intensification. The proposed 4kV-to-13kV voltage conversion/station upgrades will resolve the inherent limitations of the 4kV and increase capacity. More information on Hydro Ottawa's capacity upgrade plans can be found in Section 2 of Schedule 2-5-8 - System Service Investments. Overall, Hydro Ottawa's future plans seek to bring the SEPC KPI within or under target over the next rate application term.

3.4.1.2. Stations Approaching Rated Capacity

This KPI is defined as the percentage of stations operating at or above 100% of their rated capacity. The calculation for this KPI is provided below. Rated capacity is defined as the sum of the maximum ratings of all transformers within a given station. Exceeding this operational threshold can result in accelerated transformer degradation and loss of life, impacting system reliability and longevity.

$$Stations\ Approaching\ Capacity\ (\%) = \frac{\#\ of\ Stations\ Approaching\ Rated\ Capacity}{\#\ of\ Total\ Stations}$$

Table 14 - Stations Approaching Rated Capacity

KPI	Target	2019	2020	2021	2022	2023
SARC %	0%	0%	0%	1.1%	0%	0%
Count		0	0	1	0	0

Since 2019, Hydro Ottawa has succeeded in meeting the KPI target of keeping all stations under their rated capacity during the annual system peak, as per Table 14. There is one exception in 2021, where a station was approaching its rated capacity due to capacity constraints in the South 28kV system. It was ensured that the station was operated in a safe manner and the time period when it operated close to rated capacity did not cause any damage to the equipment. The energization of Cambrian MTS in 2022, alleviated this unique situation by bringing additional capacity support to that area.

3.4.2. Feeder Capacity

Hydro Ottawa employs a comprehensive feeder capacity planning approach that considers both coincident peak loading and single (N-1) contingency scenarios. This methodology necessitates the evaluation of two key capacity ratings:

- **Feeders Exceeding Planning Capacity:** This metric identifies feeders where the operational load surpasses the planned capacity, highlighting potential areas of concern.
- **Feeders Approaching Rated Capacity:** This metric identifies feeders nearing their maximum capacity, enabling proactive mitigation to prevent overload conditions.

3.4.2.1. Feeders Exceeding Planning Capacity

This KPI is defined as the percentage of feeders with a summer peak operating load exceeding 100% of their planned capacity rating, calculated using the equation below.

$$Feeders\ Exceeding\ Capacity\ (\%) = \frac{\#\ of\ Feeders\ Exceeding\ Planning\ Capacity}{\#\ of\ Total\ Feeders} \times 100\%$$

Table 15 - Feeders Exceeding Planning Capacity

KPI	Target	2019	2020	2021	2022	2023
FEPC %	≤ 10%	1.6%	1.9%	1.0%	0.9%	2.2%
Count		13	17	8	10	19

As per Table 15, Hydro Ottawa has succeeded in keeping feeders below the 10% target for feeders exceeding their planning capacity. Hydro Ottawa's proactive approach of load balancing and redundancy/backups ensures that adequate capacity is maintained in contingency scenarios, providing secure and reliable power delivery to customers. Feeders that are operating over their planning rating are symptomatic of excess demand at the station, rather than a feeder-level capacity concern, and hence this KPI will continue to improve with the implementation of station capacity plans. Secondly, feeders operating above planning capacity are mostly in the Nepean 8kV system which is currently insufficient to manage the load growth due to electrification in the region. The proposed Greenbank MTS in the South 28kV system will help cater to large loads as well as introduce the 28kV system in the Nepean region. Please see further details in Schedule 2-5-8 - System Service Investments.

3.4.2.2. Feeders Approaching Rated Capacity

This KPI is defined as the percentage of feeders operating at or above 90% of their rated capacity. The calculation for this KPI is provided below. Rated capacity is defined as the 8-hour loading limit of the egress cable. Sustained operation above this threshold for periods exceeding 8 hours can result in overheating and accelerated degradation of the cable, ultimately impacting system reliability and longevity.

$$Feeders\ Approaching\ Capacity\ (\%) = \frac{\#\ of\ Feeders \geq 90\%\ of\ Rated\ Capacity}{\#\ of\ Total\ Feeders} \times 100\%$$

Table 16 - Feeders Approaching Rated Capacity

KPI	Target	2019	2020	2021	2022	2023
FARC %	0%	0.1%	0.4%	0.1%	0%	0%
Count		1	3	1	0	0

As per Table 16, as of 2022, Hydro Ottawa has met the KPI goal for feeders approaching rated capacity. As discussed in Section 3.4.2.1 above, the proactive approach for load balancing and redundancy has ensured based on feeder-level design that feeders do not see excessive amperage. Aforementioned capacity concerns in the South 28kV system led to excessive loading in some feeders, however, the energization of Cambrian MTS and other capacity upgrade work has alleviated that concern since 2022.

3.4.3. System Losses

Hydro Ottawa continuously monitors and records annual system losses to ensure they remain within acceptable levels. An upward trend in losses would trigger the identification of investment needs aimed at reducing losses and maintaining the established levels of service.

Distribution system losses, as defined by the OEB Distribution System Code, are "*energy losses that result from the interaction of intrinsic characteristics of the distribution network such as electrical resistance with network voltages and current flows.*" Table 17 presents the historical performance of system losses as referenced in Table 1 - Losses as a Percentage of Higher Value Purchases for the Previous Five Years in Schedule 8-2-3 - Loss Adjustment Factors.

Table 17 - System Losses

KPI	Target	2019	2020	2021	2022	2023
Losses %	≤ 3.02%	3.02%	3.14%	2.89%	3.05%	3.10%

Hydro Ottawa committed to preparing a plan to reduce distribution system losses as part of Hydro Ottawa's 2021-2025 Approved Settlement Agreement for the Custom Incentive Rate-Setting Application, and maintain the five-year average total system losses below the target of 3.02%.[12]

Please refer to Attachment 8-2-3(B) - Hydro Ottawa System Loss Plan (the Plan), which outlines six mitigating actions to further reduce system losses. These actions included power factor correction, load balancing, reconductoring, voltage conversion, review of unmetered load services, and project optimization. While Hydro Ottawa did not achieve the target of an average system loss below 3.02% over the 5-year period, a low 5-year average total system loss was maintained along with a commitment to continue implementing the Plan. As a part of Hydro Ottawa's regular reliability improvement initiatives and distribution enhancement projects, load balancing and reconductoring is assessed and implemented. There are planned voltage conversions in place and Hydro Ottawa endeavours to continue investing in loss improvement through the execution of the capital programs planned in the 2026-2030 period.

4. HISTORICAL RELIABILITY PERFORMANCE

Hydro Ottawa diligently monitors and reports on its service reliability performance in accordance with OEB reporting requirements for electricity distributors. This section provides a detailed analysis of Hydro Ottawa's reliability performance trends, including an evaluation of SAIDI and SAIFI. A comprehensive assessment of Hydro Ottawa's performance against the OEB's Service Reliability Indicators is presented in Section 4.1 (SAIFI) and Section 4.2 (SAIDI) of this document.

Hydro Ottawa has completed Appendix 2-G, documenting historical performance of Service Quality Requirements, as outlined in Section 7 of the Distribution System Code, and Service Reliability Indicators. Appendix 2-G can be found as Excel Attachment 2-5-3(A) - OEB Appendix 2-G - Service Quality and Reliability Indicators.

[12] Hydro Ottawa Limited, *2021-2025 Custom Incentive Rate-Setting Approved Settlement Agreement*, EB-2019-0261 (September 18, 2020).

The following sections provide a detailed look at historical system reliability, including a close examination of primary cause trends and an in-depth exploration of the factors underlying these trends. The reliability metrics established by Hydro Ottawa in the 2021-2025 DSP are:

- System Average Interruption Frequency Index (SAIFI)
  - SAIFI for all interruptions
  - SAIFI excluding loss of supply interruptions
  - SAIFI excluding Major Events and loss of supply interruptions
- System Average Interruption Duration Index (SAIDI)
  - SAIDI for all interruptions
  - SAIDI excluding loss of supply interruptions
  - SAIDI excluding Major Events and loss of supply interruptions
- Worst Feeder Analysis
- Major Event Days Summary
- Loss of Supply Summary
- Analysis of cause of interruption
  - Number of interruptions that occurred as a result of the cause of interruption
  - Number of customer interruptions that occurred as a result of the cause of interruption
  - Number of customer-hours of interruptions that occurred as a result of the cause of interruption

4.1. SYSTEM AVERAGE INTERRUPTION FREQUENCY INDEX (SAIFI)

SAIFI represents the average frequency of sustained interruptions per customer and is defined as follows:

$$SAIFI = \frac{Total\ number\ of\ customer\ interruptions}{Total\ number\ of\ customers\ served}$$

SAIFI, is reported in three ways:

- **All Interruptions:** This includes all interruptions, regardless of cause.

- **Interruptions Excluding Loss of Supply (LoS):** This excludes interruptions caused by LoS events outside of Hydro Ottawa's distribution system, such as loss of supply from Hydro One.
- **Interruptions Excluding LoS and Major Event Days (MEDs):** This further refines the metric by excluding interruptions caused by LoS and MEDs, such as severe storms, which are outside of Hydro Ottawa's control.

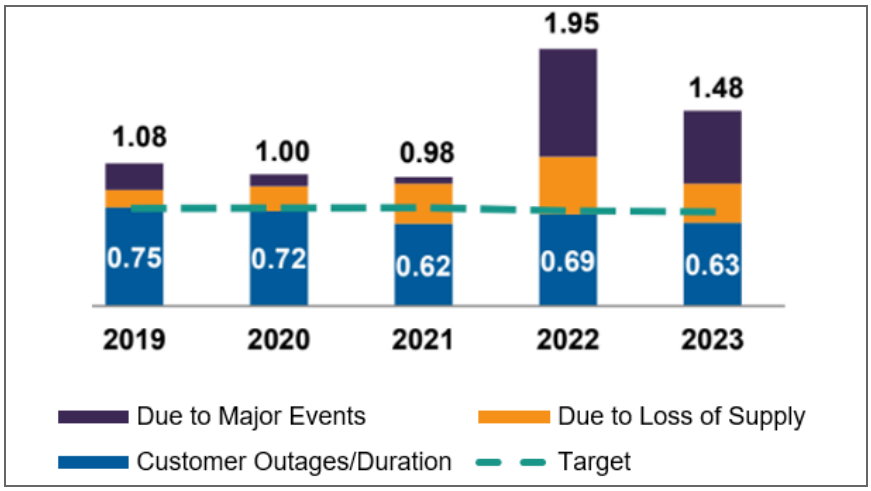
Excluding interruptions caused by MEDs and LoS allows for a more focused evaluation of system performance and isolates factors within Hydro Ottawa's control. Hydro Ottawa's target for SAIFI is to maintain a value at or below the five-year rolling average, excluding MEDs and LoS events. This objective aligns with the OEB distributor-specific target for reliability performance. Table 18 and Figure 4 below show SAIFI performance in tabular form and in graphical form for different methods to depict Hydro Ottawa performance.

Table 18 - SAIFI Reliability Performance

KPI		2019	2020	2021	2022	2023
SAIFI	All Interruptions	1.08	1.00	0.98	1.95	1.48
	Excluding LoS	0.95	0.81	0.67	1.51	1.18
	Excluding LoS & MEDs	0.75	0.72	0.62	0.69	0.63
	SAIFI Target[13]	0.74	0.74	0.74	0.72	0.71

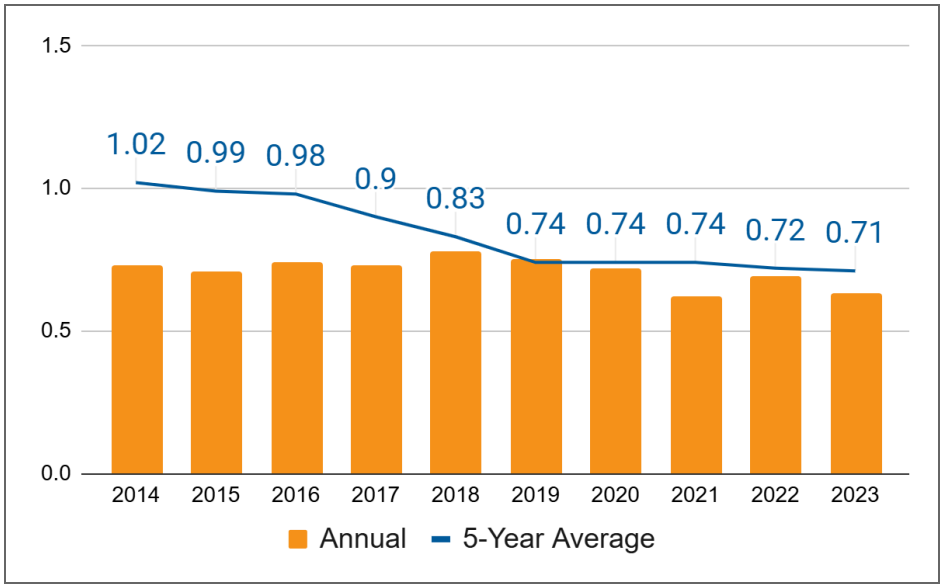
[13] This value represents the rolling five-year historical average excluding LoS and MED.

Figure 4 - SAIFI Reliability Performance



Hydro Ottawa has demonstrated strong reliability performance over the past five years, consistently meeting its goal of keeping the SAIFI excluding LoS and MED, below or equal to the five-year historical average. This trend is particularly evident when excluding major weather events, with 2021 and 2023 showing especially strong performance. The only exception was a slight exceedance of the target by 0.01 in 2019, due to the higher number of outages which were unplanned, mainly due to lightning, foreign interference and unknown, and human element issues. In general, Hydro Ottawa's SAIFI performance has improved due to the renewal of deteriorating key assets, corrective maintenance, feeder reconfigurations to reduce customer impact, and continued improvements to protection coordination. The reduction in annual targets, which are determined based on a rolling 5-year average SAIFI performance excluding Loss of Supply and Major Event Days, demonstrates that targeted efforts mentioned above have supported the overall improvement to system reliability. Figure 5 below shows this downward trend from 2014 through 2023.

Figure 5 - SAIFI excluding Loss of Supply and Major Event Days



However, severe weather events like the 2022 Derecho and the 2023 freezing rain and thunder/hail storms caused significant disruptions, leading to a sharp increase in SAIFI. These events, categorized as MED, highlight the challenge of maintaining reliability in the face of unpredictable weather patterns. Sections 4.4 - Major Event Days and 4.5.3 - Loss of Supply below provide detailed analyses of historical MED and LoS events, respectively.

To maintain the SAIFI trend (excluding LoS and MED), Hydro Ottawa has proposed plans for enhanced investment in degraded assets at risk of failure, feeder ties to enhance redundancy by addressing radial supply configurations, installing sectionalizing devices, feeder reconfigurations and strategic undergrounding of vulnerable overhead sections. For further details on these investments, please refer to Section 3 of Schedule 2-5-8 - System Service Investments.

4.2. SYSTEM AVERAGE INTERRUPTION DURATION INDEX (SAIDI)

SAIDI represents the average interruption duration per customer and is defined as follows:

$$SAIDI = \frac{Total\ hours\ of\ customer\ interruptions}{Total\ number\ of\ customers\ served}$$

SAIDI, is reported in three ways:

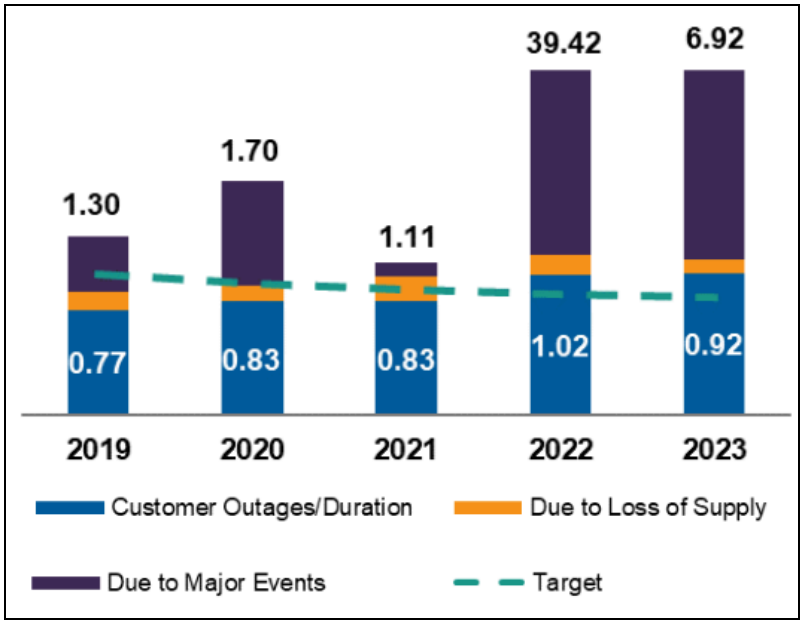
- **All Interruptions:** This includes all hours of customer interruptions, regardless of cause.
- **Interruptions Excluding Loss of Supply (LoS):** This excludes hours of customer interruptions caused by LoS events outside of Hydro Ottawa's distribution system, such as loss of supply from Hydro One.
- **Interruptions Excluding LoS and Major Event Days (MEDs):** This further refines the metric by excluding LoS and hours of customer interruptions caused by MEDs, such as severe storms, which are outside of Hydro Ottawa's control.

Excluding interruptions caused by MEDs and LoS helps to evaluate system and process performance without extenuating circumstances not fully within Hydro Ottawa's control. Hydro Ottawa's target for SAIDI is to maintain a value at or below the five-year rolling average, excluding MEDs and LoS events. This objective aligns with the OEB distributor-specific target for reliability performance. Table 19 and Figure 6 below show SAIDI performance in tabular form and in graphical form for different methods to depict Hydro Ottawa performance.

Table 19 - SAIDI Reliability Performance

KPI		2019	2020	2021	2022	2023
SAIDI	All Interruptions	1.30	1.70	1.11	39.42	6.92
	Excluding LoS	1.17	1.60	0.93	39.28	6.82
	Excluding LoS & MEDs	0.77	0.83	0.83	1.02	1.03
	SAIDI Target[14]	1.02	0.96	0.91	0.88	0.86

Figure 6 - SAIDI Reliability Performance

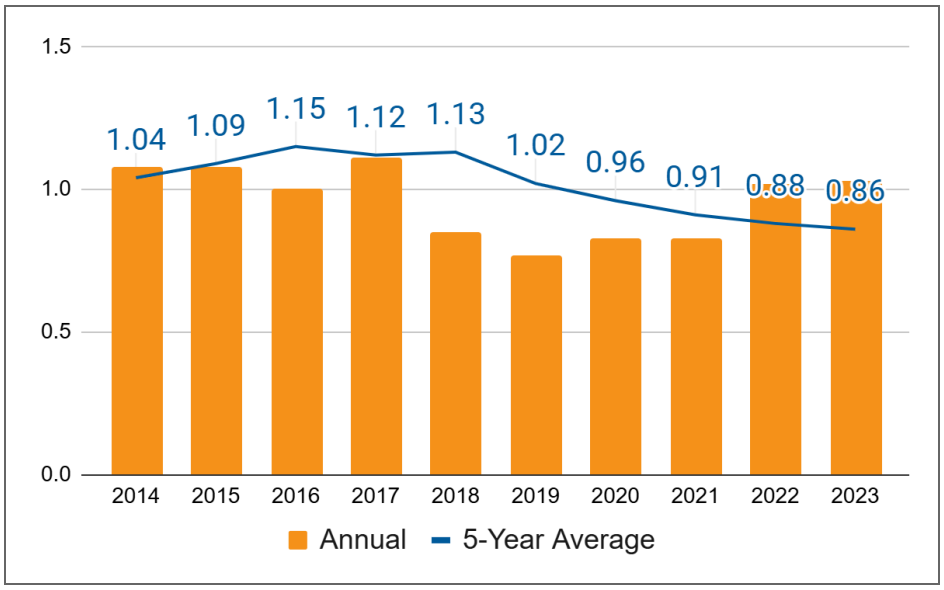


Similar to SAIFI, SAIDI, which measures the average outage duration for each customer, has also been impacted by major weather events. Excluding LoS and MEDs, SAIDI performance remained stable from 2019 to 2021. However, in 2022 and 2023, SAIDI exceeded the five-year average target by 0.14 and 0.17, with a small percentage (3%) of outages being responsible for a relatively large proportion (48%) of SAIDI. This was due to several factors, including delays in making areas safe, increased adverse weather events, need for additional fault locating equipment and resources, tree

[14] This value represents the rolling five-year historical average excluding LoS and MED.

contact, and foreign interference. These findings highlight the importance of mitigating these factors through measures such as investment in resilient infrastructure and enhanced emergency response capabilities to reduce outage duration and severity, and improve grid reliability and resilience. More details are presented below in Section 5 - Continuous Improvement. In general, the targeted infrastructure renewal projects have improved overall system reliability, which is shown by the reduction in annual targets. These targets are determined by using a rolling 5-year average SAIDI performance, excluding Loss of Supply and Major Event Days. Figure 7 shows this downward trend from 2014 to 2023.

Figure 7 - SAIDI excluding Loss of Supply and Major Event Days



Severe weather events like the 2022 Derecho and the 2023 freezing rain and thunder/hail storms caused significant disruptions, leading to a sharp increase in SAIDI. These events, categorized as MED, highlight the challenge of maintaining reliability in the face of unpredictable weather patterns. For a detailed analysis of historical LoS and MED events, please refer to Sections 3.2 - Cost Efficiency & Effectiveness and 3.1 - Customer Oriented Performance, respectively.

To enhance the system's resilience against future storms and support quicker restoration times, Hydro Ottawa is investing in targeted projects through the Distribution System Resiliency, Distribution System Reliability and Distribution System Observability programs, as a key part of its System Service investments, please refer to Schedule 2-5-8 - System Service Investments. These projects aim to mitigate the impact of major weather events on the distribution system, improving grid resilience and advancing grid technology to support faster fault identification and isolation.

To improve the SAIDI trend (excluding LoS and MED), Hydro Ottawa has proposed plans for feeder ties to enhance redundancy by addressing radial supply configurations, installing sectionalizing devices, strategic undergrounding of vulnerable OH sections, relocating lines from areas that are difficult to access, installing remote operable switches and smart fault circuit indicators. For further details on these investments, please refer to Section 3 of Schedule 2-5-8 - System Service Investments.

4.3. WORST FEEDER ANALYSIS

Hydro Ottawa uses a Feeder Performance Index (FPI) to assess the condition of its electricity distribution feeders. This index, detailed in Table 20, considers outage frequency, customer impact, and outage duration over a 12-month period.

Table 20 - Feeder Condition Description

FPI	Performance
85-100	Very Good
70-85	Good
50-70	Fair
30-50	Poor
0-30	Very Poor

Feeders with an FPI score below 30 ("Very Poor" performance) are placed on a worst-performing feeder list. The number of feeders on the worst-performing feeder list has remained relatively stable

since tracking began in 2019, with a peak in 2020. Table 21 provides the number of worst-performing feeders over the past five years.

Table 21 - Worst Feeder Analysis

KPI	2019	2020	2021	2022	2023
Worst Feeder Analysis	5	8	6	7	6

Hydro Ottawa continuously monitors feeder performance to guide targeted improvements and minimize customer impact. Hydro Ottawa further addresses the poorly performing feeders through targeted investments in worst feeder betterment projects, please refer to Section 3.6.3.4 of Schedule 2-5-8 - System Service Investments, for details such as:

- Reconfiguring feeders
- Upgrading distribution protection
- Installing sectionalizing devices (reclosers, remotely operable switches)
- Adding animal guards

4.4. MAJOR EVENT DAYS

In accordance with the OEB's RRRs, Hydro Ottawa utilizes the IEEE Standard 1366 approach to identify MEDs.[15] The threshold for classifying an MED is determined annually based on the previous five years' daily SAIDI values.

Over the past five years, Hydro Ottawa has experienced 12 MEDs, as illustrated in Figure 8 below. A notable increase in MED severity was observed in 2022 compared to the preceding three years.

[15] IEEE Std 1366-2022 - IEEE Guide for Electric Power Distribution Reliability Indices.

Figure 8 - Major Event Day Threshold

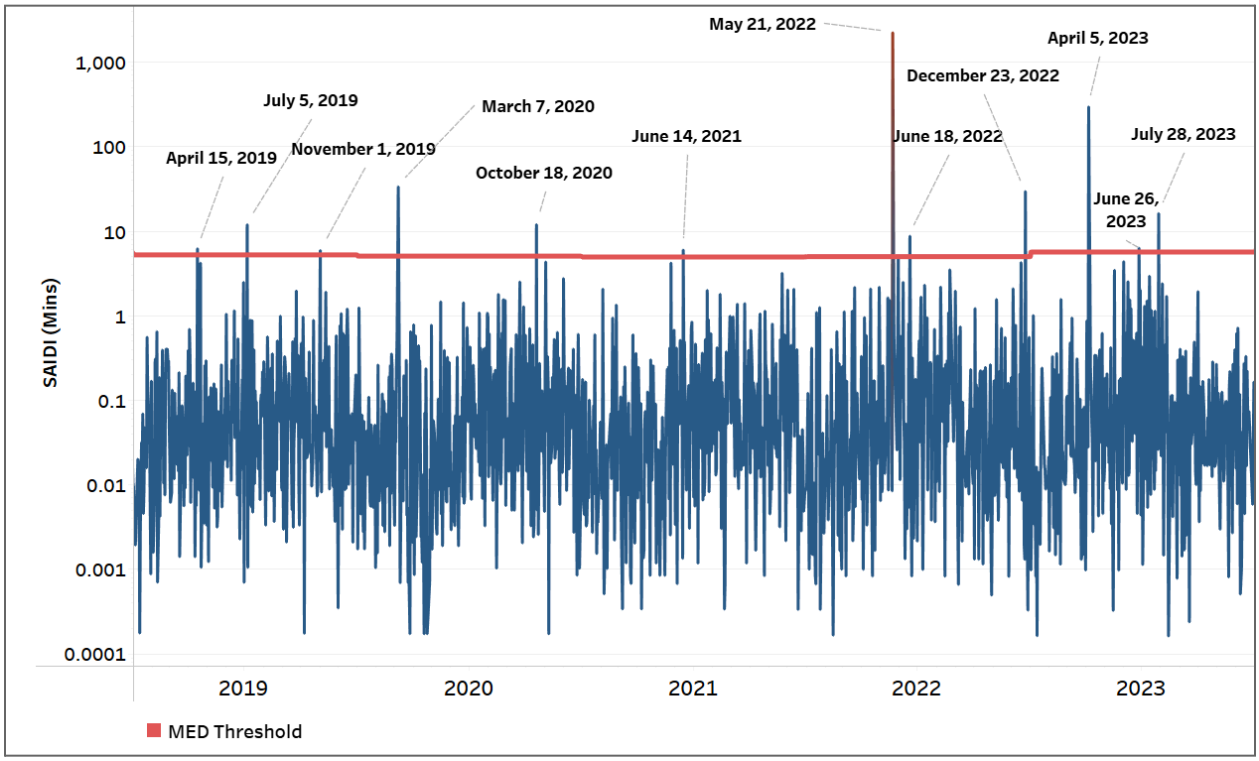


Table 22 below reveals the significant impact of MEDs on reliability over the past five years, with a particular focus on the devastating May 21, 2022 Derecho depicted in the images in Figure 9. This storm stands out as the most impactful event in Hydro Ottawa history, causing a staggering 13,367,385 customer-hours of interrupted service and a SAIDI value of 37.58 hours per customer. This far surpasses the impact of other major events, not only in the past five years but also in the history of the community.

Table 22 – 2019-2023 Major Event Day Overview

Event Date	Interruption Count	Customer		SAIDI (Mins)	Event Description
		Hours	Impacts		
2019-04-15	11	34,425	44,511	6.14	Lightning, Flooding, and Loss of Supply
2019-07-05	13	68,268	70,069	12.14	Hydro One Station derating and an interruption due to planned work
2019-11-01	22	33,805	14,228	5.98	Heavy Wind resulting in Falling Trees and Downed Power Lines
2020-03-07	1	193,888	11,686	34.05	Equipment failure resulting in a fire
2020-10-18	2	69,519	9186	12.14	Loss of Supply and Defective Equipment
2021-06-14	2	35,363	17,441	6.06	Caused by Lightning and Loss of Supply
2022-05-21	City wide	13,367,385	192,474	2,254.65	Derecho storm outages (May 21, 23, 28, 30, and 31), all of which are MEDs
2022-06-18	1	51,196	27,405	8.62	Cable Fault impacting six Hydro Ottawa substations
2022-12-23	35	179,856	67,710	29.98	Loss of Supply and Wet Snow
2023-04-05	112	1,960,834	163,448	324.96	Freezing Rain and a subsequent Loss of Supply
2023-06-26	15	38,691	15,413	6.39	Thunderstorm, Lightning and Loss of Supply
2023-07-28	28	99,360	37,821	16.40	Hailstorms resulting in Falling Trees and Downed Power Lines

Figure 9 - Damage caused by the Derecho Storm in May 2022

Given the numerous and complex drivers influencing the effects of MEDs on the distribution grid, including changing weather patterns, distribution of vulnerable assets, and regional topography, a key indicator of vulnerability is the historical record of MED impacts on regions and infrastructure. Table 23 details the distribution of MED outages between main trunk (main lines designed to handle higher loads and distribute electricity from stations to multiple lateral lines) and lateral sections (lines that branch off the main trunk to serve smaller areas and could extend radially) in the different regions of Hydro Ottawa's service territory since 2019.

Table 23 - Regional Breakdown of MED Outages between Main Trunk and Lateral since 2019

Region	Main Trunk Outage	Lateral Outage
Central	10%	11%
East	21%	15%
South	13%	16%
West	8%	6%
All Regions	**52%**	**48%**

Analysis of MED outages since 2019 indicates that approximately 52% occurred on main trunks, while the remaining 48% occurred on lateral sections. The East region experienced the highest

number of main trunk outages (21%), and the South region experienced the highest number of lateral outages (16%). Analyzing the infrastructure and regions most disrupted by these outages helps guide resilience program investment, please refer to Section 3 of Schedule 2-5-8 - System Service Investments. The findings from this analysis, along with inputs from Attachment 2-5-4(E) - Resilience Investment Business Case Report and Section 6.4 of Schedule 2-5-4 - Asset Management Process, inform resilience investments to strategically improve system resilience to severe weather events.

4.5. PERFORMANCE BY CAUSE CODE

Hydro Ottawa assiduously records all power interruptions in accordance with the OEB's definitions for primary causes outlined in the OEB's RRRs. Hydro Ottawa conducts detailed root cause analysis on these interruptions, allowing for risk assessment and investment prioritization. The cause codes defined by the OEB are stated in Table 24 below.

Table 24 - OEB Definition of Cause Codes

Root Cause	Definition
0 - Unknown	Interruptions with no apparent cause
1 - Scheduled Outage	Interruption due to disconnection at a selected time for the purpose of construction or maintenance.
2 - Loss of Supply	Interruption due to problems associated with the distribution system owned and/or operated by another distributor, and/or in the transmission system.
3 - Tree Contacts	Interruption caused by faults resulting from tree contact with energized circuits except for the interruptions under the conditions described under cause code 6.
4 - Lightning	The lightning category includes all interruptions caused by lightning.
5 - Equipment Failure	Interruption resulting from the failure of distributor owned equipment due to deterioration, insufficient maintenance or defective equipment/material.
6 - Adverse Weather	Interruption resulting from severe rain, ice storms, heavy snow, severe windstorm (~90 kilometres an hour or greater), extreme temperatures, freezing rain, frost, hail or other extreme weather conditions (exclusive of cause code 4).
7 - Adverse Environment	Interruption due to distributor equipment being subject to abnormal environments, such as salt spray, industrial contamination, humidity, corrosion, vibration, fire or flooding.
8 - Human Element	Interruption due to the interface of distributor staff with the distribution system. Only interruptions caused by distributor staff should be reported under this cause code, including improper protection settings, improper system operation and improper construction & installation.
9- Foreign interference	Interruption caused by external factors, such as those caused by customer equipment, DERs not owned by distributors, animals, vehicles, dig-ins, vandalism, sabotage, foreign objects and cyber security events.

Table 25 below shows the SAIDI, SAIFI contribution by cause code over the 2019-2023 period with specific contributions broken out for number of interruptions, number of customer interruptions, and the number of customer interruption hours.

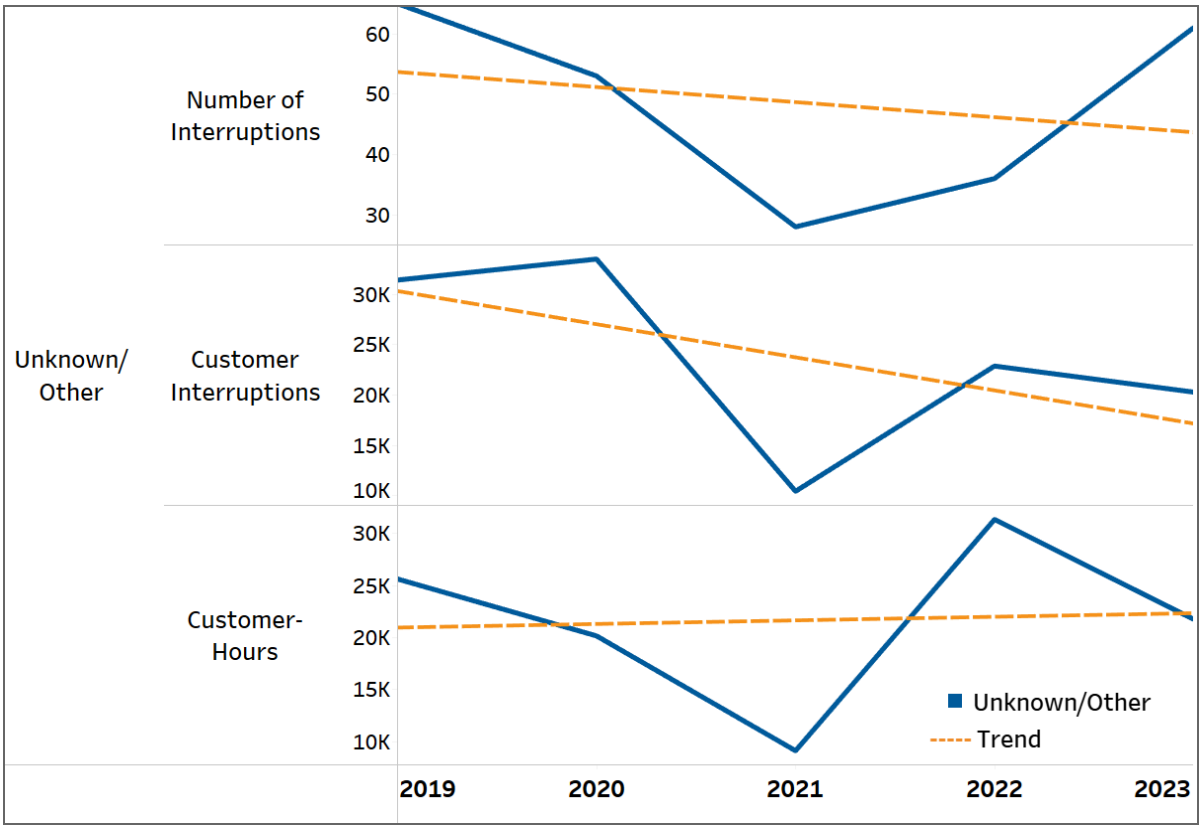
Table 25 - Five-Year SAIFI and SAIDI Contribution by Outage Type (Excluding MED's)

Code - Cause	SAIFI & SAIDI Contribution	2019	2020	2021	2022	2023
0 - Unknown	Number of Interruptions	65	53	28	36	61
	Customer Interruptions	31,447	33,536	10,420	22,886	20,294
	Customer-Hours	25,623	20,163	9,138	31,339	21,762
1 - Scheduled Outages	Number of Interruptions	645	753	740	614	550
	Customer Interruptions	13,621	22,520	17,044	20,529	29,634
	Customer-Hours	34,807	49,203	59,257	45,350	55,557
2 - Loss of Supply	Number of Interruptions	24	26	34	38	19
	Customer Interruptions	44,089	64,759	107,282	155,674	107,874
	Customer-Hours	42,548	37,565	64,603	52,284	35,794
3 - Tree Contact	Number of Interruptions	60	104	82	101	95
	Customer Interruptions	32,418	18,548	21,460	43,967	32,733
	Customer-Hours	35,526	30,671	30,337	74,967	47,158
4 - Lightning	Number of Interruptions	21	27	16	9	22
	Customer Interruptions	24,659	12,188	11,031	7,008	18,931
	Customer-Hours	8,284	6,797	13,883	3,812	15,713
5 - Equipment Failure	Number of Interruptions	262	265	247	209	158
	Customer Interruptions	64,747	94,236	65,871	100,769	43,302
	Customer-Hours	79,803	104,622	97,052	144,848	84,798
6 - Adverse Weather	Number of Interruptions	13	6	11	10	41
	Customer Interruptions	3,671	1,393	10,706	4,285	13,228
	Customer-Hours	4,237	4,750	7,511	5,852	34,915
7 - Adverse Environment	Number of Interruptions	9	4	9	3	2
	Customer Interruptions	1,327	197	8,740	221	1,243
	Customer-Hours	2,190	475	9,754	530	2,436
8 - Human Element	Number of Interruptions	23	9	17	14	11
	Customer Interruptions	33,391	8,267	19,019	11,109	28,727
	Customer-Hours	16,452	1,508	13,139	3,720	33,600
9 - Foreign Interference	Number of Interruptions	208	177	151	109	169
	Customer Interruptions	47,360	55,962	53,375	36,416	41,057
	Customer-Hours	51,891	65,971	48,916	54,714	77,856

4.5.1. Unknown/Other

Figure 10 provides a visual representation of the trend in outages caused by unknown/other (excluding MEDs) over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year.

Figure 10 - Unknown/Other Historical Trends



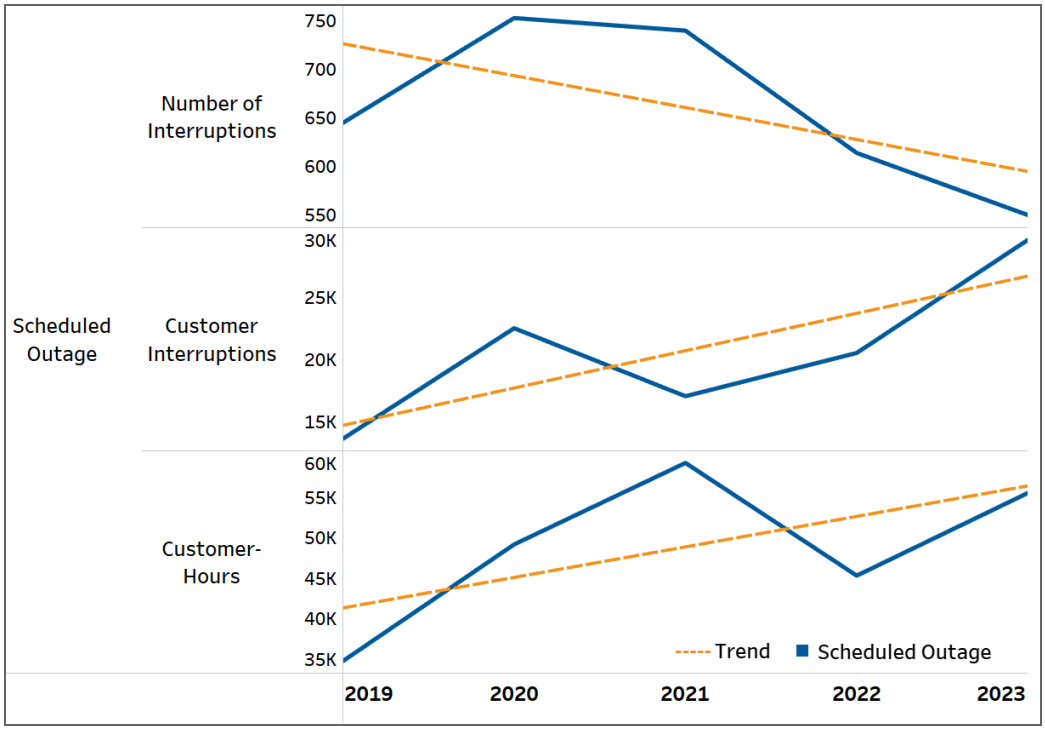
Outages due to Unknown/Other are on a slightly decreasing trend over the last five years with an increase of occurrences in 2023, Hydro Ottawa strives to identify the root causes of unknown outages through line patrols and fault point analysis, however, there are occasions where the cause cannot be identified leading to outages being classified as Unknown/Other. Investment in observability technology under the Distribution System Observability program will lead to a decrease in Unknown/Other outages as more data becomes available for pinpointing and assessing

root cause. For more information on observability investments please refer to Section 3.5.4 of Schedule 2-5-8 - System Service Investments.

4.5.2. Scheduled Outages

The OEB defines a Scheduled Outage as a customer interruption due to disconnection at a selected time for the purpose of construction or maintenance. These outages include maintenance and construction work to maintain the assets, as well as, repair work and vegetation management to address the aftermath of MEDs and other events. Figure 11 presents trending for scheduled outages leading to customer interruptions over the past five years. The trends include the number of interruptions, the number of customers interrupted, and the total customer interruption hours.

Figure 11 - Scheduled Outage Historical Trend



While the number of interruptions has decreased, as a result of improved work planning, both the number of customers interrupted and the total customer interruption hours have increased. These increases are primarily attributed to:

- **Major infrastructure upgrades:** Complex riser rebuilds and pole replacements for radial lines, close to highways and in backyards which results in longer outage duration and customer impact.
- **Power restoration activities:** Forced switching and sectionalizing to allow for attending to emergencies such as pole fires and major events.
- **Post-storm recovery:** Extensive vegetation management, with the need to trim outside of the regular trim zone due to vegetation damage from storms.

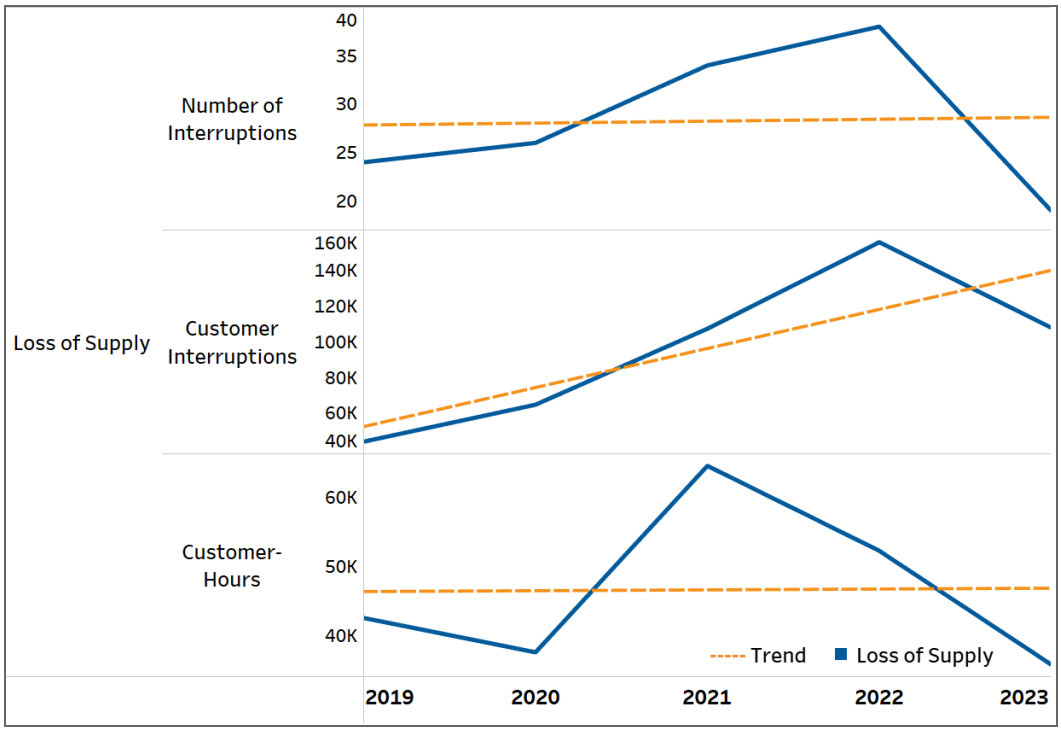
These drivers highlight the lasting impact of major weather events on the distribution system and the ongoing need to maintain and replace deteriorating infrastructure which drives further work.

To mitigate the impact of scheduled outages, Hydro Ottawa endeavours to install temporary switches and employ live-line work methods to reduce the number of affected customers whenever possible. However, due to feeder configuration, some planned work necessitates extended outages. To address this, Hydro Ottawa is taking proactive steps, as part of this application, by planning to reconfigure high-risk radial lines and strategically increase control points to reduce the impact of future planned outages. Refer to Section 3 of Schedule 2-5-8 - System Service Investments for more details.

4.5.3. Loss of Supply

The OEB defines LOS as customer interruptions due to problems associated with the distribution system owned and/or operated by another distributor, and/or in the transmission system. These outages are attributed to issues upstream with Hydro Ottawa's transmission provider, Hydro One. Figure 12 presents trending for LOS (excluding MEDs) leading to customer interruptions over the past five years. The trends include the number of interruptions, the number of customers interrupted, and the total customer interruption hours.

Figure 12 - Historical SAIFI and SAIDI Contribution from LOS Outages



Over the past five years, Hydro Ottawa has maintained relatively stable performance in managing LoS events, particularly with respect to the number of interruptions and customer interruption hours. However, the number of customers affected has trended upward, due to LoS events impacting circuits and stations serving larger customer bases. A notable spike occurred in 2022, with significant increases in both the number of interruptions and customer interruptions, resulting from a surge in LoS events affecting densely populated areas. In 2021, customer interruption hours were significantly impacted by a single LoS event caused by Hydro One crews inadvertently tripping one of Hydro Ottawa's supply stations. Given the projected increase in severe weather events, as discussed below in Section 6.4 - Current and Future Climate, LoS events are expected to continue.

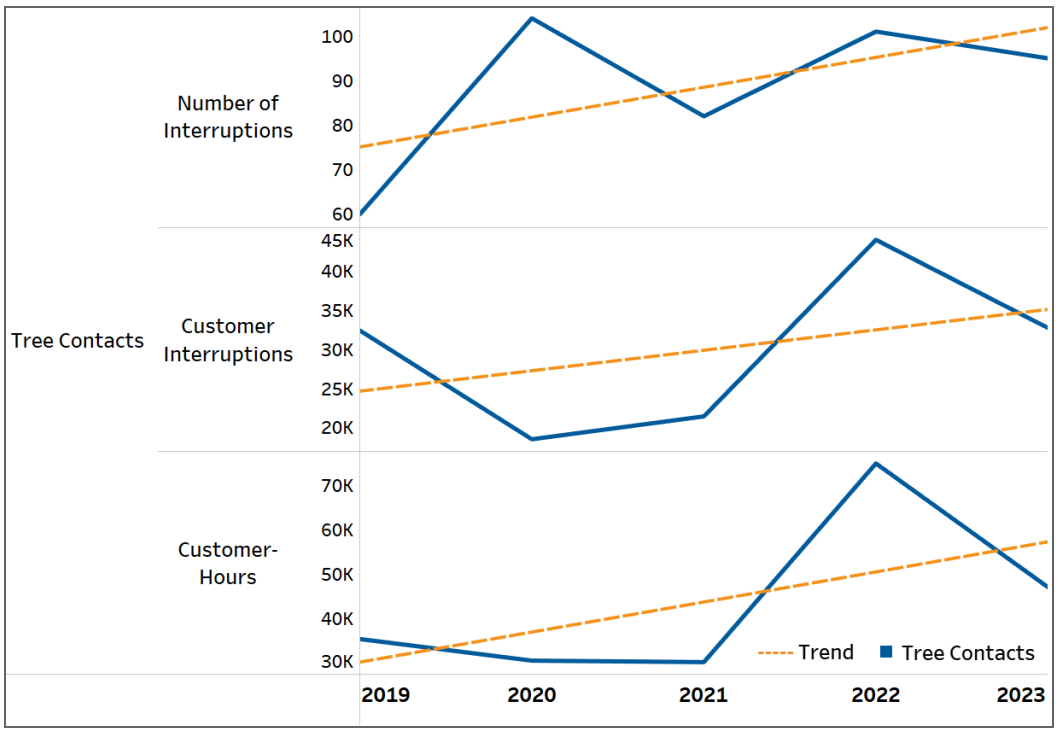
Hydro Ottawa actively monitors and analyzes LoS-related interruptions to proactively identify and address supply reliability issues and minimize customer impact. The primary mitigation strategy

involves collaborating with Hydro One through recurring meetings and the Integrated Regional Resource Process (IRPP). This collaboration focuses on Hydro One's investigation and subsequent infrastructure maintenance and upgrades to support Hydro Ottawa's needs. Additionally, Hydro Ottawa explores opportunities to reduce LoS impact through distribution system mitigation like the installation of tie switches between feeders to reduce the impact of LoS events though partial load transfers to unaffected feeders. These improvements are considered opportunistically within other projects under the Distribution Enhancements Program. For further details, please refer to Section 3 of Schedule 2-5-8 - System Service Investments.

4.5.4. Tree Contacts

The OEB defines Tree Contacts as customer interruption caused by faults resulting from tree contact with energized circuits except for the interruptions under the conditions described under Adverse Weather and excluding MEDs. Figure 13 below is a visual representation of the trend in outages caused by tree contacts over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year.

Figure 13 - Tree Contacts Outage Historical Trend



Hydro Ottawa experienced a sharp increase in tree-contact outages in both 2020 and 2022. The 2022 outages were particularly disruptive for customers, impacting both the number of customers affected and the duration of their outages. This disruption stemmed from the lingering effects of the 2022 Derecho Storm on the tree canopy, compounded by other storms (not classified as MEDs) and tree contact with main trunk lines. Contact with main trunk lines (the primary arteries for electricity flow) resulted in widespread customer outages.

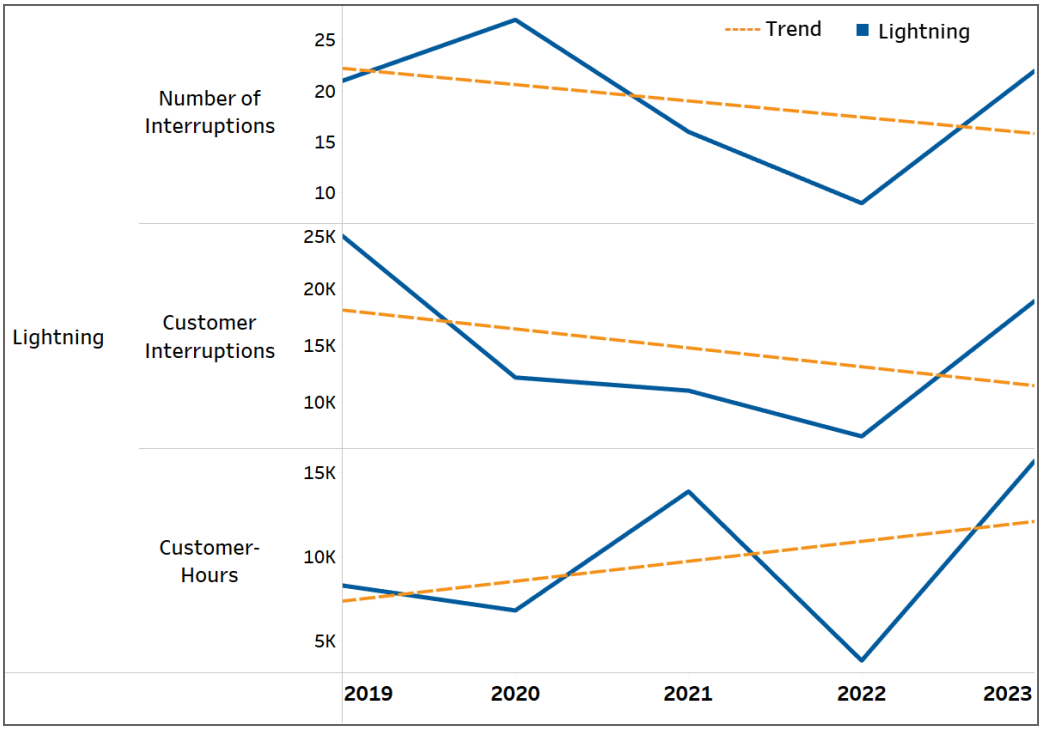
To mitigate the impact of tree contacts, Hydro Ottawa has adopted Overstory, a software solution that optimizes vegetation management. Overstory uses Artificial Intelligence (AI) and remote sensing data, such as satellite and aerial imagery, to map vegetation within Hydro Ottawa's service area. Additional information on the application of Overstory is outlined in Schedule 1-3-4 - Facilitating Innovation and Continuous Improvement. Furthermore, increased investment in

vegetation management through the OM&A Program, please refer to Section 3.2 of Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs, is enabling Hydro Ottawa to address the heightened vegetation management needs following severe weather events. This enhanced approach allows Hydro Ottawa to better manage the risk of tree-related outages and improve the reliability of power delivery, even with the rising prevalence of severe weather.

4.5.5. Lightning

The OEB defines all interruptions caused by lightning excluding MEDs as lightning causes. Figure 14 provides a visual representation of the trend in outages caused by lightning over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year, offering insights into how lightning impacts Hydro Ottawa's service reliability.

Figure 14 - Lightning Historical Trend

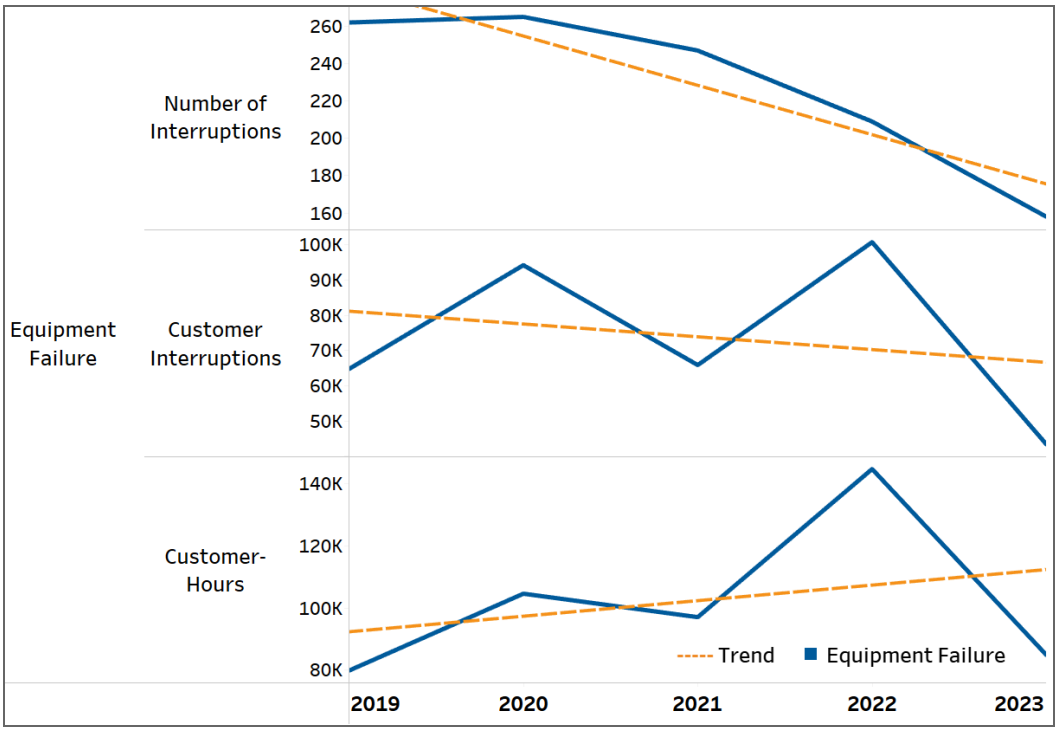


Outages caused by lightning strikes are generally decreasing. Hydro Ottawa proactively mitigates the impact of lightning on its system through robust system design and the application of lightning protection and shielding measures in designs. These measures help to minimize the number and duration of outages caused by lightning, contributing to improved system reliability.

4.5.6. Equipment Failure

The OEB defines Equipment Failure as Customer Interruption resulting from the failure of distributor owned equipment due to deterioration, insufficient maintenance or defective equipment/material. Figure 15 shows equipment failure trends over the last five years with respect to the number of interruptions, number of customers interrupted and customer interruption hours.

Figure 15 - Equipment Failure Historical Trend



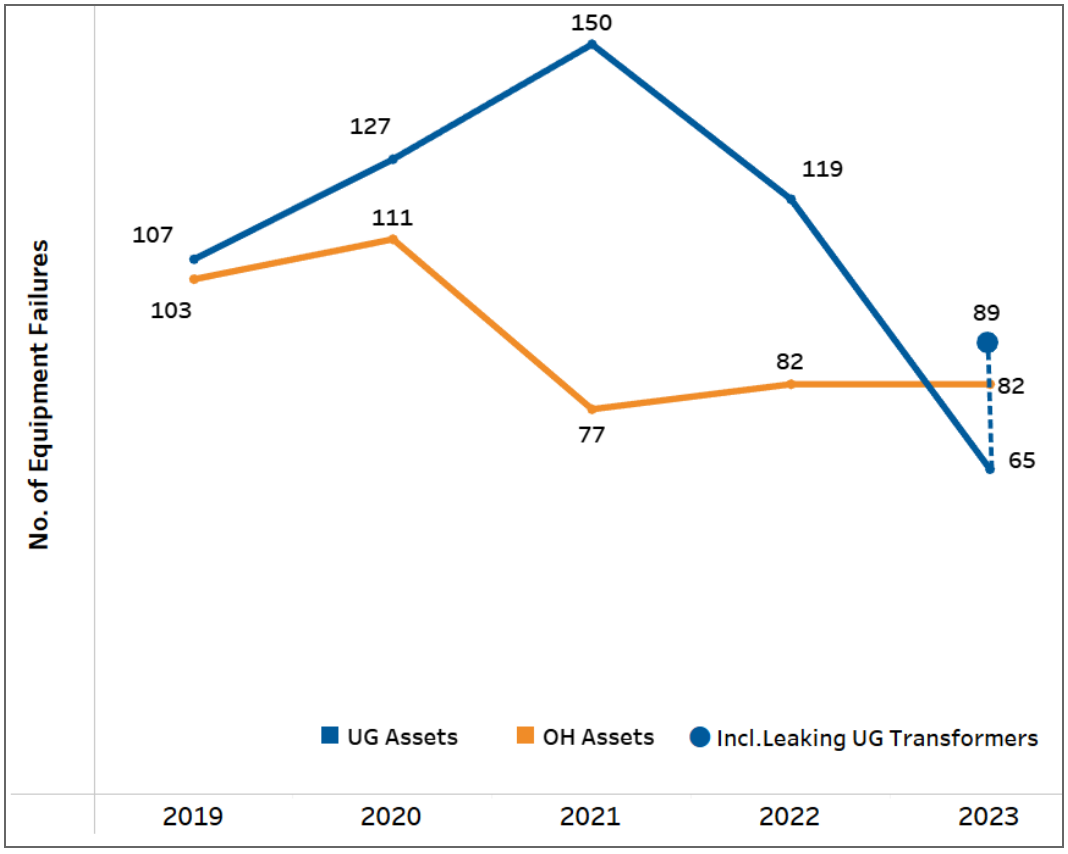
Hydro Ottawa has observed a decline in equipment failure-related outages since 2020, attributed to enhanced maintenance programs and asset condition assessments. To further mitigate equipment failures as asset deterioration progresses, an enhanced asset risk assessment framework has been implemented to determine asset replacement needs over the next five years. This framework utilizes Predictive Analytics, incorporating data from condition assessments and asset failure curves, to assess the risk of failure, for details please refer to Section 5.1.4 of Schedule 2-5-4 - Asset Management Process. The risk-based approach, combined with analysis of observed failures of specific asset types, has informed investment proposals for targeted renewals. For further details, please refer to Schedule 2-5-7 - System Renewal Investments and for enhanced maintenance programs, please refer to Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs. Furthermore, the Distribution System Observability Program as outlined in Section 3.5.4 of Schedule 2-5-8 - System Service Investments aims to improve the detection, localization, and restoration of failed equipment through the deployment of additional observation devices.

4.5.6.1. Equipment Failure by Asset Orientation

Building on the strategy of a Predictive Analytics supported risk assessment framework, a detailed analysis of different equipment types and their associated failure modes can provide valuable insights for informing mitigation strategies.

Figure 16 below provides a closer look at equipment failure trends, specifically analyzing failures based on asset orientation (overhead versus underground).

Figure 16 - Equipment Failure by Asset Orientation



Overhead and underground assets face different stressors and thus will have different failure drivers. Analysis of the failure trend for underground and overhead assets reveals a peak in underground (UG) asset failures in 2021, followed by a decrease in 2022. This peak was primarily driven by an investigation into leaking transformers from a specific manufacturer, which led to a significant equipment replacement program.

In 2023, leaking transformers were reclassified as scheduled outages, resulting in a notable drop in UG equipment failures recorded for that year as equipment replacement to address leaking transformers continued to be reported under the Schedule Outage category. The inclusion of

leaking transformers under the Equipment Failure category would have resulted in 42 UG transformer-related outages in 2023, resulting in a consistent trend.

4.5.6.2. Equipment Failure by Asset Orientation & Asset Type

A more granular analysis of equipment failures, based on both asset type and orientation, can highlight asset types requiring closer attention. Table 26 presents equipment failure trends from 2019 to 2023, categorized by asset orientation (overhead vs. underground) and specific equipment type. This detailed breakdown provides a deeper understanding of the factors contributing to equipment failures and outages.

Table 26 - Equipment Failure by Primary Apparatus

Primary Apparatus	2019	2020	2021	2022	2023
OH Conductor	17	21	13	9	24
OH Switchgear	34	46	27	26	25
OH Transformers	34	26	19	24	20
Pole	4	6	7	8	2
Pole Attachment	14	12	11	15	11
UG Cable	63	44	48	51	34
UG Cable Attachment	8	12	7	8	8
UG Switchgear	1	2	1	6	3
UG Transformers	34	67	92	49	41 (24 leakers)
Vault Equipment	1	2	2	5	3

Table 26 reveals several key trends in equipment failures. While UG cable failures decreased significantly in 2023, following a steady trend since 2020, overhead (OH) conductor failures saw a slight increase compared to 2022. The increase in OH conductor failures reflect the impact of extreme weather events in 2023, compounded by the ongoing deterioration of overhead

infrastructure. The data also indicates that UG transformers, UG cables, and OH switchgear experienced the highest number of failures between 2019 and 2023.

To address these issues, Hydro Ottawa has dedicated renewal programs, which will continue through 2026-2030. Also, based on the information gathered through preventative maintenance, the Emergency Renewal program shall cover the replacement of leaking transformers, to reduce the proportion of known leakers.

The proportion of UG cross linked polyethylene (XLPE) cables in a deteriorated condition is projected to increase from 36.4 km in 2024 to 336 km in 2030, necessitating significant investments, as outlined in Section 2.3.2 of Schedule 2-5-1 - Distribution System Plan Overview. Hydro Ottawa has adopted a forward looking approach to reduce the burden on customers by proposing investments in the UG cable renewal program to maintain system reliability and manage the remaining proportion of deteriorating infrastructure through corrective renewal investments and improvements to preventative maintenance programs as outlined in Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs.

The proposed UG distribution asset renewal spend can be found in Section 4 of Schedule 2-5-7 - System Renewal Investments and specifics on the Emergency Renewal program in Section 6 of Schedule 2-5-7 - System Renewal Investments. Additionally, the observed trend in OH switchgear failures has led to increases to the renewal program for this asset type, as detailed in Section 3.5.2 of Schedule 2-5-7 - System Renewal Investments.

4.5.6.3. Unplanned Asset Replacements

Not all equipment failures cause an outage to customers. Hydro Ottawa's proactive approach to addressing functionally deteriorated assets before they fail has supported the decreasing reliability trend in the number of equipment failures, whereas there is still the impending risk of failure of assets in poor or very poor condition. Corrective renewal, an asset intervention/replacement investment program, is prompted by specific risks that could compromise the asset's performance

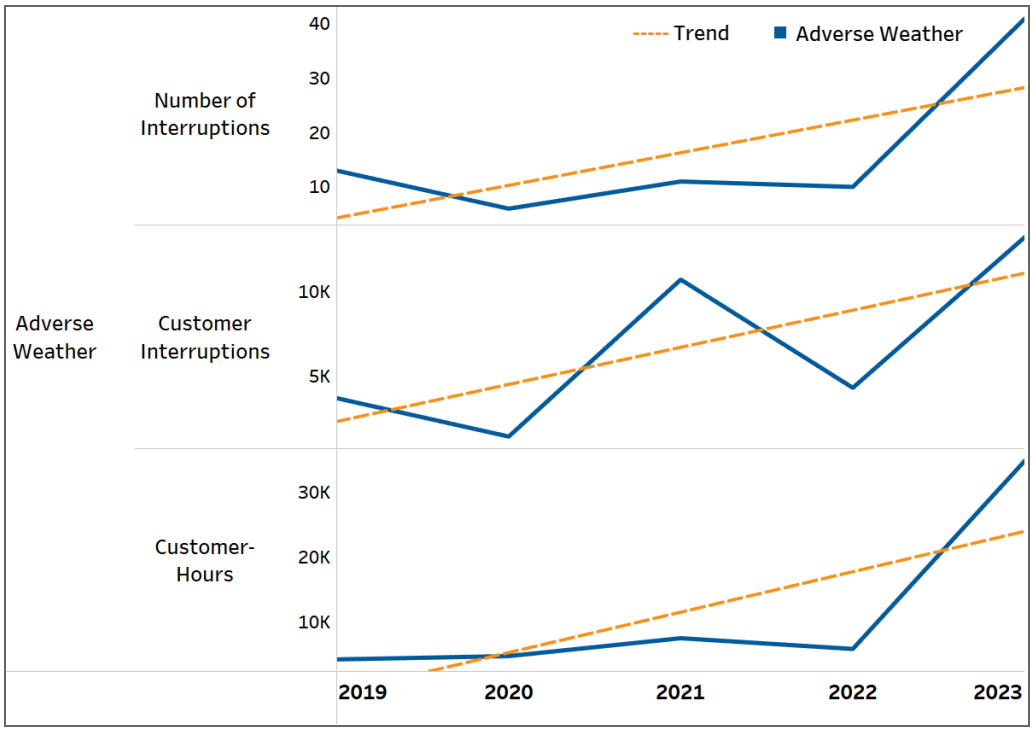
or system reliability, informed by the routine maintenance programs and subsequent asset condition assessment/health indexing. This means that assets that pose an immediate or imminent risk of failure are replaced or remediated before they cause an unplanned outage. The information gathered through preventative maintenance programs has been instrumental in this regard and Hydro Ottawa will continue to make further improvements in the OM&A programs through 2026-2030, as outlined in Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs. Further information on Hydro Ottawa's asset condition assessment framework is provided in Section 5.1.2.1 of Schedule 2-5-4 - Asset Management Process. Further details on Hydro Ottawa's Corrective Renewal program can be found in Section 6 of Schedule 2-5-7 - System Renewal Investments.

4.5.7. Adverse Weather

The OEB defines Adverse Weather as a customer interruption resulting from severe rain, ice storms, heavy snow, severe windstorm (~90 kilometres an hour or greater), extreme temperatures, freezing rain, frost, hail or other extreme weather conditions excluding lightning and MEDs.

Figure 17 below provides a visual representation of the trend in outages caused by adverse weather over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year, offering insights into how weather impacts Hydro Ottawa's service reliability.

Figure 17 - Adverse Weather Historical Trend



Outages attributed to adverse weather have been on the rise over the past five years. These outages are primarily caused by extreme winds, wet snow and ice accumulation, and freezing rain, which can damage overhead equipment and disrupt service.

To address this growing concern, Hydro Ottawa analyzes these weather-related outages, along with those occurring during MEDs, to identify vulnerable infrastructure and prioritize projects that enhance system resilience. These projects, which are part of the broader resiliency program, are informed by several key resources:

- **Resilience Investment Business Case Report (Attachment 2-5-4(E)):** This study provides insights into the potential benefits and costs of strategically relocating vulnerable overhead infrastructure underground.

- **Section 6.4: Historic and Future Climate (Schedule 2-5-4 - Asset Management Process):** This section assesses the potential impact of climate change on the distribution system and helps identify areas that may require increased resilience measures.

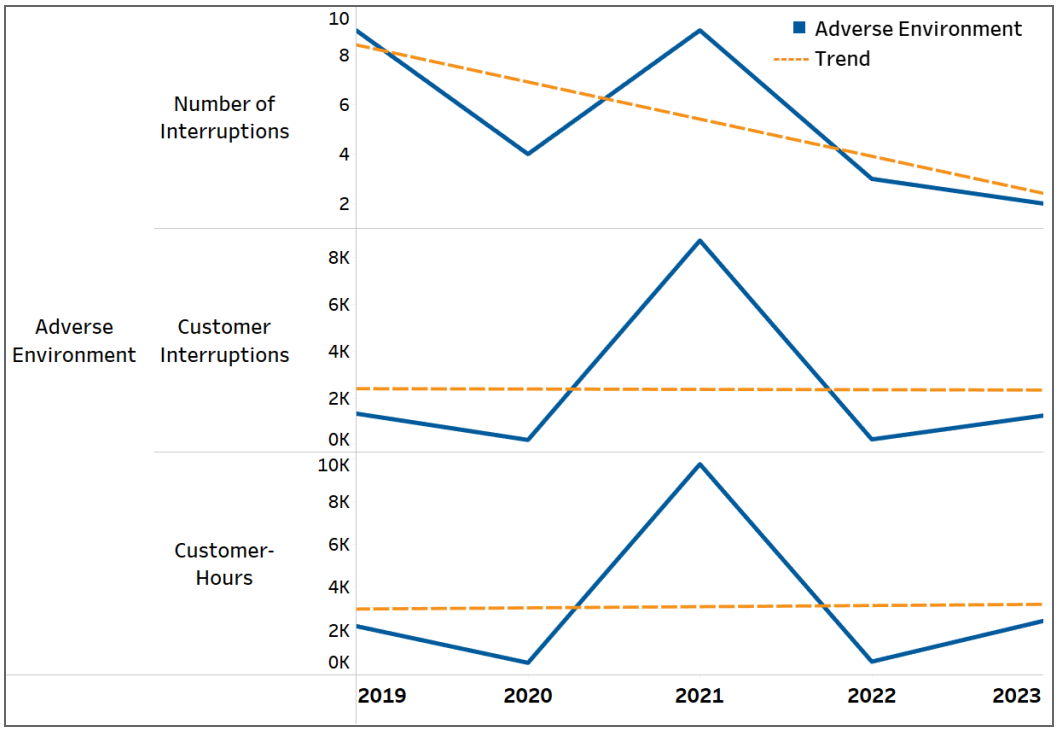
- **Section 3: Distribution Enhancement (Schedule 2-5-8 - System Service Investments):** This section outlines specific projects and initiatives aimed at improving the overall resilience of the distribution system, including targeted upgrades and undergrounding.

By leveraging these resources and analyzing outage data, Hydro Ottawa is proactively working to mitigate the impact of adverse weather on its system and improve service reliability for customers.

4.5.8. Adverse Environment

The OEB defines interruptions from Adverse Environment as customer interruption due to distributor equipment being subject to abnormal environments, such as salt spray, industrial contamination, humidity, corrosion, vibration, fire or flooding (excluding MEDs). Figure 18 below provides a visual representation of the trend in outages caused by adverse environmental factors over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year, offering insights into how environmental factors impact Hydro Ottawa's service reliability.

Figure 18 - Adverse Environment Historical Trend

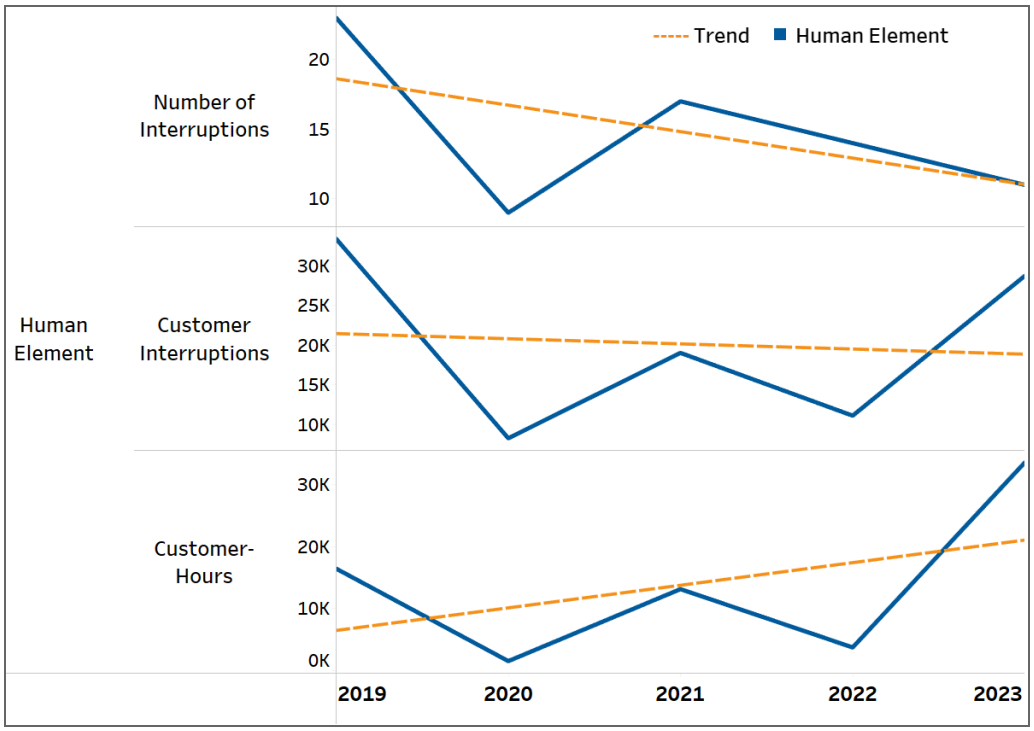


Outages caused by adverse environmental conditions have shown a declining trend over the past five years. Historically, these outages were largely attributed to pole fires resulting from salt contamination on insulators, a by-product of the City of Ottawa's winter de-icing efforts. The maximum impact/peak in 2021 was due to two outage events (one due to a fire started by grass/vegetation beneath a pole and the other related to a pole fire from salt contamination). To primarily mitigate the risk of pole fires, Hydro Ottawa has implemented a bi-annual insulator wash program to remove salt and other contaminants. Additionally, the ongoing renewal and replacement of older insulators with polymer insulators and prompt clearing of vegetation around poles further reduces this risk.

4.5.9. Human Element

The OEB defines interruptions from Human Elements as customer interruption due to the interface of distributor staff with the distribution system. Only interruptions caused by distributor staff should be reported under this cause code, including improper protection settings, improper system operation and improper construction & installation. Figure 19 shows human element trends over the last five years with respect to the number of interruptions, number of customers interrupted and customer interruption hours.

Figure 19 - Human Element Outage Historical Trend



The high number of interruptions Hydro Ottawa experienced in 2019 were primarily caused by commissioning and switching errors, which have since been addressed and prevented. Despite a general downward trend in human-caused outages since 2019, Hydro Ottawa experienced a peak in customer impact (measured in both hours and number of customers affected) in 2023. This was

attributed to two major outages: one stemming from an out-of-phase system condition and another triggered by a Dual Element Supply Network (DESN) station alarm issue. Root cause analysis has been conducted for both these incidents, and system-wide measures have been implemented to prevent similar occurrences.

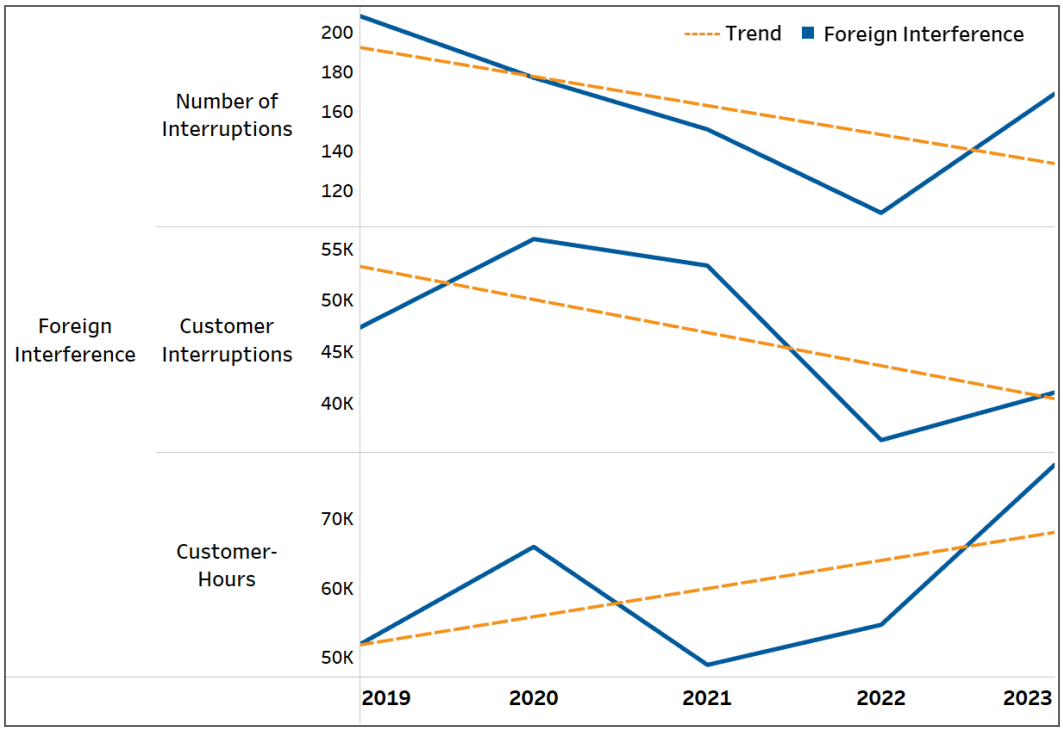
To mitigate further occurrences, Hydro Ottawa is committed to continued collaboration with its contractors to ensure that work methods, training, and internal procedures are all current and aligned with best practices.

4.5.10. Foreign Interference

The OEB defines an outage caused by Foreign Interference as a customer interruption caused by external factors, such as those caused by customer equipment, DERs not owned by distributors, animals, vehicles, dig-ins, vandalism, sabotage, foreign objects and cyber security events excluding MEDs.

Figure 20 provides a visual representation of the trend in outages caused by foreign interference over the past five years. The figure details the number of interruptions, the number of customers interrupted, and the total customer interruption hours for each year, offering insights into how foreign interference impacts Hydro Ottawa's service reliability.

Figure 20 - Foreign Interference Historical Trend



While foreign interference outages show a general downward trend in the number of interruptions and customers affected, there was a notable spike in 2023. Additionally, the overall duration of these outages has been increasing, suggesting that individual incidents cause longer service disruptions.

The majority of foreign interference customer interruptions can be attributed to animal contact. To address this Hydro Ottawa is making targeted investments through its Worst Feeder Betterment program to install animal guards on equipment in areas prone to such incidents. For further details, please refer to Section 3 of Schedule 2-5-8 - System Service Investments. In addition to this, continued efforts by the damage prevention team to avoid dig-ins, along with a sustained focus on cyber security, contribute to preventing other forms of foreign interference. This proactive approach

aims to reduce outages caused by foreign interference, ultimately improving system reliability and customer experience.

5. CONTINUOUS IMPROVEMENT

Hydro Ottawa is committed to enhancing system reliability and resilience, particularly in the face of deteriorating infrastructure, increasing climate-related challenges (e.g., the May 2022 Derecho storm) and increasing demand. As highlighted in Schedule 2-5-4 - Asset Management Process, a significant portion of the existing infrastructure is nearing or exceeding Typical Useful Life (TUL), increasing the risk of equipment failures and service disruptions.

Hydro Ottawa's continuous improvement initiatives are guided by the KPIs outlined in Section 3 and Section 4. These initiatives focus on mitigating the risks associated with deteriorating infrastructure and improving system resilience against extreme weather events.

A summary of Continuous Improvement Initiatives is as follows:

- **Post-Derecho Review:** A comprehensive review of the storm response identified key successes, lessons learned, and recommendations to strengthen Business Continuity Management and incident response. This analysis forms the foundation for ongoing process optimization. The report is available in this Application as Attachment 2-1-1(A) - May 2022 Derecho - After Storm Report.
- **Enhancing Resilience:** Recognizing the increasing frequency and intensity of weather events in Ottawa, Hydro Ottawa has made enhancing grid resilience a priority. In 2019, a consultant completed a Distribution System Climate Risk and Vulnerability Assessment and Climate Change Adaptation Plan, which was reaffirmed following the 2022 Derecho, providing a foundation for understanding and addressing climate-related risks. In 2023, a consultant conducted a grid resilience assessment and proposed undergrounding investments in the Resilience Investment Business Case Report. However, due to the potential impact on customer rates, Hydro Ottawa developed guidelines with specific criteria to determine when undergrounding is critical. These guidelines also outline alternative measures to enhance

resilience when undergrounding is not the most cost-effective solution, such as line reinforcement, feeder reconfiguration, station egress undergrounding, and line relocation. Please refer to Section 6.4 of Schedule 2-5-4 - Asset Management Process for more details including the Distribution System Climate Risk and Vulnerability Assessment and Climate Change Adaptation Plan and Resilience Investment Business Case Report.

- **Proactive Asset Management:** Hydro Ottawa is implementing proactive measures such as:
  - Prioritizing the replacement of deteriorating assets at risk of failure through a robust Capital Investment Planning Process, as outlined in Section 5 of Schedule 2-5-4 - Asset Management Process.
  - Continued improvements to the UG cable maintenance program and monitoring of performance/condition based on the Very Low Frequency (VLF) Tan-Delta, Partial Discharge and Time Domain Reflectometry test methods to better understand UG cable condition and regional degradation patterns, to manage the condition and risk projections accordingly, as outlined in Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs.
  - Comprehensive testing, inspection, and maintenance programs, as defined in Schedule 4-1-2 - Operations, Maintenance and Administration Program Costs, which ensure the longevity of distribution assets and identify any necessary corrective actions.
  - More accurate asset condition assessments, with a focus on continuous improvement of data collection and analysis.
  - Increased inspection and replacement of deteriorating underground transformers to reduce environmental risks, incorporating lessons learned from previous incidents.
- **Data-Driven Decision Making:**
  - Hydro Ottawa implemented Predictive Analytics to forecast equipment degradation and optimize system renewal investments based on each individual asset condition and risk (considering reliability, safety, environmental, financial and compliance risk measures) for the 2026-2030 period, contributing to a data-driven continuous improvement cycle. Please refer to Section 5.1.4 of Schedule 2-5-4 - Asset Management Process for further details.

- To address the potential for data misinterpretation due to fluctuations in asset population, Hydro Ottawa has implemented a more nuanced perspective on asset health. Data-driven asset failure curves (implemented as a part of Predictive Analytics) are utilized for capital investment planning, in forecasting asset degradation patterns. These curves forecast asset degradation over time and provide valuable insights into asset performance trends. A detailed report on this asset failure curve analysis is available in Attachment 2-5-4 (D) - Failure Curves Review.
- Root cause analysis of equipment failures informs targeted maintenance and replacement strategies, facilitating proactive identification and resolution of recurring issues.

- **Adoption of Station and Feeder Load Index:** Hydro Ottawa has refined its approach to assessing station and feeder capacity. While historically, four KPIs were used — Stations Exceeding Planning Capacity, Stations Approaching Rated Capacity, Feeders Exceeding Planning Capacity and Feeders Approaching Rated Capacity — Hydro Ottawa has adopted the Station Load Index and Feeder Load Index to provide a more comprehensive and simple evaluation. Further details regarding the methodologies for these indices can be found in Section 8.4 of Schedule 2-5-4 - Asset Management Process.
- **Strengthened Internal Governance:** Hydro Ottawa has reinforced its internal financial reporting and controls for capital programs, with a focus on transparency and accountability. Monthly program and portfolio meetings ensure collaborative discussions and data-informed decision-making for project optimization, aligning corporate and OEB objectives. Further details can be found in Schedule 2-5-4 - Asset Management Process and in Schedule 1-3-4 - Facilitating Innovation & Continuous Improvement.
- **Productivity Management:** Recognizing the significance of pole and cable renewal programs, Hydro Ottawa is committed to optimizing program efficiency. This includes tracking unit costs to identify constraints, proactively mitigate risks, and ensure fiscally responsible resource management. New KPIs are being implemented to support monitoring, transparency, and continuous improvement in productivity. Further details can be found in Schedule 1-3-4 - Facilitating Innovation & Continuous Improvement.

- **Improving Outage Restoration:** Based on analyzing the reliability trends between 2019 and 2023, Hydro Ottawa has observed an overall increase in the annual outage duration aspect, despite a decrease in the number of customer interruptions and outage count (with the SAIDI targets not met in 2022 and 2023). Overall, the 5-year averages of both SAIDI and SAIFI have been declining since 2014, indicating a positive trend.

When analyzing the factors impacting SAIDI, Hydro Ottawa has observed:

- Delays in making the outage area safe (coordinating with the City of Ottawa and Emergency Services);
- Increase in adverse weather events (not classified as MEDs) requiring increased patrolling and safety measures prior to restoration;
- Need for more fault locating equipment and SCADA switches;
- Tree contact due to deteriorating vegetation outside of the regular trim zones (requiring additional support and time for clearing); and
- Foreign interference due to motor vehicle accidents and failure of customer owned equipment causing delays in restoration due to the coordination involved.

The number of customer interruptions (measured through SAIFI) have continued to improve due to the prioritization of asset renewals in a deteriorated condition that impact system reliability and factors such as continued improvements to protection coordination, feeder reconfigurations, improving redundancy etc.

As a part of continuing to reduce outage restoration times, Hydro Ottawa is proposing investments in the Distribution Enhancements program, with the following intended benefits:

- **Faster Restoration Times**: Distribution enhancements like automated switches, additional feeder ties, and system reconfiguration provide system operators with more options for isolating outages and restoring load. This leads to faster restoration times and reduces the duration of outages for customers.

- **Backup Supply Options**: Feeder ties and network reconfiguration provide backup supply options during contingency scenarios, such as equipment failures or storm damage. This ensures that customers can be re-energized more quickly, even if part of the system is damaged.
- **Improved System Observability**: Enhancements to system observability allow for real-time monitoring of distribution asset performance. This enables early detection of issues, proactive intervention to prevent failures, and more efficient outage response and troubleshooting.
- **Increased Resilience**: Investments in grid resilience, such as strategic undergrounding and pole line reinforcement, reduce the likelihood of damage from adverse weather events. This minimizes the number of outages and speeds up the restoration process when outages do occur.

Investments in the distribution enhancements program are targeted to improve the speed and efficiency of outage restoration by providing System Operators with more tools and options, thereby enhancing system visibility and increasing the overall resilience of the grid. More information regarding Hydro Ottawa's distribution enhancements program can be found in Section 3 of Schedule 2-5-8 - System Service Investments.

Hydro Ottawa is committed to ensuring grid resilience and providing reliable service to customers by proactively mitigating potential risks. This is achieved through a multifaceted approach that incorporates continuous improvement initiatives, robust governance structures, and effective productivity management. Recognizing that risk is a function of both the probability of an event and its potential impact, Hydro Ottawa proactively manages risk by prioritizing strategies that both minimize the probability of known risks and mitigate the impact of unforeseen events to safeguard its infrastructure, maintain operational efficiency, and provide a consistent and dependable service to its customers.

6. PERFORMANCE MEASUREMENT FRAMEWORK

Hydro Ottawa maintains a strong commitment to transparent monitoring and reporting of its performance in alignment with the rules, regulations and guidance provided by the OEB. This commitment is demonstrated through comprehensive annual reporting, including RRRs, the Electricity Utility Scorecard submission, and annual Custom Incentive Rate (CIR) reports.

For the 2026-2030 DSP, Hydro Ottawa has transitioned to a risk-based asset management framework, augmented by advancements in data analytics capabilities. This evolution has informed the approach to performance measurement.

The adoption of risk-based asset management, coupled with strategic investments in analytics, enables a more comprehensive assessment of Hydro Ottawa's network assets. The 2026-2030 DSP performance outcomes are specifically designed to directly evaluate plan performance at the Material Investment Plan (MIP) level, ensuring greater accuracy and alignment with the company's evolving operational context. Hydro Ottawa has defined MIPs across the four key investment categories:

- System Access - Schedule 2-5-6 - System Access Investments
- System Renewal - Schedule 2-5-7 - System Renewal Investments
- System Services - Schedule 2-5-8 - System Service Investments
- General Plant - Schedule 2-5-9 - General Plant Investments

The performance of each MIP aligns with the performance outcomes established by the OEB. The relationship between OEB performance outcomes, investment categories, and KPIs is detailed in Table 27 below. Further details regarding the expected performance of each MIP are provided in the referenced schedules.

The alignment between Hydro Ottawa's Asset Management Objectives, Corporate Strategy, and the OEB's performance outcomes is visually represented in Figure 5 of Section 4.2 in Schedule 2-5-4 - Asset Management Process.

Table 27 - KPI Names and Categories

Investment Category	OEB Performance Outcome	KPI Name	KPI Target
System Access (Schedule 2-5-6)	Public Policy Responsiveness Customer Focus	New Residential & Small Business Services Connected on Time	≥ 95%
System Renewal (Schedule 2-5-7)	Operational Effectiveness	Reliability Risk Reduction - All Assets	Monitor
		Number of 4kV Feeders Converted	30
		Length of Cable Replaced	≥ 90%
		Number of Poles Replaced	≥ 90%
		Percentage of Metering Assets reaching EOL	≤ 56%
System Service (Schedule 2-5-8)	Operational Effectiveness Customer Focus	Incremental System Capacity	577 MVA
		Station Loading Index	0%
		Controllability & Observability	≥ 30%
		Resilience Risk Mitigated	≥ 15,000
		Worst Performing Feeders	≤ 6
		Percentage of Field Area Network (FAN) assets centrally managed	≥ 60.0%
		Field Area Network (FAN) System Service Level Agreement	99.9%
General Plant (Schedule 2-5-9)	Operational Effectiveness	Percentage of Medium and Heavy Duty Fleet Vehicles at End of Life (EOL)	10-15%
		Network & Service Uptime	≥ 99.9%
		Percentage of Systems that are Supported	≥ 95%
		Percentage of Systems that are Current	≥ 75%

6.1. SYSTEM ACCESS

New Residential & Small Business Services Connected on Time

This KPI, as defined in Section 7.2 of the Distribution System Code and discussed in Attachment 1-3-3(C) - Electric Utility Scorecard Analysis, tracks percentage of new service connection requests

for low-voltage customers (less than 750 volts) completed within five business days after all applicable service conditions are satisfied, or at a later date agreed upon by the customer and distributor.

Hydro Ottawa's target is to meet this timeline for a minimum of 95% of these connection requests.

6.2. SYSTEM RENEWAL

Reliability Risk Reduction - All Assets

This KPI measures the overall reliability risk associated with all major assets. It tracks the reduction in this risk as compared to the 2024 baseline level.

Hydro Ottawa's target is to monitor the overall reliability risk score for assets by 2030 compared to the 2024 baseline.

Number of 4kV Feeders Converted

This KPI tracks the feeder conversions driven by the planned decommissioning of EOL 4kV station assets during the 2026-2030 rate period.

Hydro Ottawa's target is to convert 30 4kV feeders by 2030. This is a five-year target based on the initiatives outlined in Schedule 2-5-7 - System Renewal Investments.

Length of Cable Replaced

This KPI measures the percentage of the actual length of cable replaced versus the planned length, in km, through the Cable Replacement program.

Hydro Ottawa's target is to replace at a minimum 90% of the planned length of cable, in km. This is a five-year target based on the initiatives outlined in Schedule 2-5-7 - System Renewal Investments.

Number of Poles Replaced

This KPI measures the percentage of the number of poles replaced versus the planned number of poles through the Pole Renewal program.

Hydro Ottawa's target is to replace at a minimum 90% of the planned number of poles. This is a five-year target based on the initiatives outlined in Schedule 2-5-7 - System Renewal Investments.

Percentage of Metering Assets reaching EOL

This KPI measures the proportion of metering assets that have reached or exceeded their EOL. The goal is to meet or achieve a reduction in the 2030 projected percentage of assets reached or exceeded EOL. This indicates improved asset health and reduced risk of failure.

Hydro Ottawa's target is to achieve a percentage of metering assets reaching EOL at or below 56% by 2030. This is a five-year target based on the initiatives outlined in the MIP.

6.3. SYSTEM SERVICE

Incremental System Capacity

This KPI measures the increase in incremental system capacity achieved through Hydro Ottawa owned stations and Non-Wires Solutions (NWSs) planned upgrades. The target is to increase capacity by 577 MVA through a combination of new station construction or upgrades, and Hydro Ottawa owned Battery Energy Storage System (BESS) unit installations. Note that this target is gross, and does not include the decommissioning of station assets.

Hydro Ottawa's target is to achieve a total capacity increase of 577 MVA by 2030. This is a five-year target based on the initiatives outlined in Schedule 2-5-8 - System Service Investments.

Station Load Index

This KPI measures the percentage of stations operating with a load index of 4 or 5, as defined in Section 8.4 of Schedule 2-5-4 - Asset Management Process. A load index of 4 or 5 signifies that a station is operating near or exceeding its capacity rating, posing a risk to reliability and stability.

Hydro Ottawa's target is zero stations with a Load Index of 4 or 5 by 2030. This is a five-year target based on the initiatives outlined in Schedule 2-5-8 - System Service Investments.

Controllability & Observability

This KPI tracks the percentage of normally-open overhead and underground distribution switches that are equipped with automation capabilities. This measures the extent to which the distribution grid can be remotely controlled and its status remotely monitored.

Hydro Ottawa's target is to achieve a minimum of 30% of all normally-open overhead and underground switches to be automated by 2030, measured against the 2024 baseline. This is a 5-year year target based on the initiatives outlined in Schedule 2-5-8 - System Service Investments.

Resilience Risk Mitigation

This KPI measures the effectiveness of investments in enhancing the resilience of the distribution grid to adverse weather events. Specifically, it quantifies the monetary value of the enhanced resilience achieved through risk mitigation resulting from undergrounding and other storm hardening projects. The unit of measurement is the Copperleaf value point, where one point is equivalent to approximately $1,000, as defined in Section 5.3.2.2 of Schedule 2-5-4 - Asset Management Process.

Hydro Ottawa's target is to achieve or exceed a resilience risk mitigation score of 15,000 by 2030. This is a five-year target based on the initiatives outlined in Schedule 2-5-8 - System Service Investments.

Worst Performing Feeders

This KPI measures the number of distribution feeders classified as "worst performing" based on their Feeder Performance Index (FPI) score. A feeder is considered "worst performing" if its FPI

score falls below 30, indicating "Very Poor" performance, as defined in Section 4.3 Worst Feeder Analysis.

Hydro Ottawa's target is to not exceed six feeders classified as worst performing. This target is based on the historical average number of worst-performing feeders from 2019-2023.

Percent of Field Area Network (FAN) Assets centrally managed

This KPI measures the percentage of eligible Remote Terminal Units (RTUs) within the Field Area Network that are centrally managed. Hydro Ottawa's target is to achieve at or above 60% of eligible RTUs centrally managed by the end of 2030. This is a five-year target based on the initiatives outlined in Schedule 2-5-8 - System Service Investments.

Field Area Network (FAN) Service Level Agreement for Class A Systems

This KPI measures the system's performance against a predefined maximum allowable downtime (Recovery Time Objective) and a maximum data loss in the event of a failure (Recovery Point Objective).

All IT systems are categorized by the business process they support. Class A systems support Mission Critical business processes which are defined as a business process if stopped, or becomes unavailable for any period of time, directly affecting the delivery of core product and/or time critical operations. Full restoration of normal functionality must be in place otherwise it will:

- Put employee and public health and safety at risk;
- Significantly impact public perception of Hydro Ottawa;
- Result in customer service levels falling below acceptable levels;
- Result in regulatory, legal or contractual infractions that will have significant financial/negative consequences to Hydro Ottawa;
- Result in significant damage/loss to Hydro Ottawa assets;
- Result in finable environmental damage; and/or
- Result in unacceptable backlog or lost work.

The performance target for Hydro Ottawa's Field Area Network (FAN), which supports mission-critical business processes, is 99.9% availability. This target is defined as a maximum allowable downtime of 4 hours and a maximum allowable data loss of 24 hours.

6.4. GENERAL PLANT

Percentage of Medium and Heavy Duty Fleet Vehicles at End of Life

This KPI measures the proportion of medium and heavy-duty fleet vehicles that have reached or exceeded their end of useful life (EOL). The target range is 10% to 15%. This range acknowledges that some vehicles may remain functional and safe beyond their typical lifespan due to condition-based replacement, minimizing maintenance costs and supporting operational efficiency. However, these heavy and medium-duty vehicles are critical workhorses, representing approximately 80% of the capital expenditures in the 2026-2030 fleet program. Therefore, maintaining the EOL percentage below 15% is crucial. Exceeding this threshold poses a significant risk due to the long lead times required for replacing these specialized vehicles. Unlike lighter-duty assets, readily available rentals or replacements for equipment like bucket trucks are not typically an option, making fleet availability paramount for uninterrupted operations. A target range of 10-15% is considered optimal to balance cost-effectiveness with the critical need to maintain a reliable fleet.

Infrastructure & Cyber Security

There are a few key KPIs that can be used to measure the performance of Infrastructure & Cyber Security Programs. These KPIs have been incorporated into KRIs that are defined in Section 8 of Schedule 2-5-9 - General Plant Investments, including:

- **Network & Service Uptime**

  This KPI will measure the overall service uptime of Hydro Ottawa's core network to ensure defined SLAs are met for Class A, B & C networks. This is a quantitative metric.

- **Systems that are Supported**

  The % of network systems that are currently running at a vendor supported level and not EOL. Systems that are EOL result in greater risk to the organization. This is a quantitative metric.

- **Systems that are Current**

  The % of network systems that are running software/firmware/baseline that are at the Vendor's recommended level. Maintaining systems at the Vendor's recommended level ensures the latest features, bug fixes and security updates have all been incorporated. This is a quantitative metric.

7. RELIABILITY TARGETS

In alignment with OEB requirements and the Electricity Utility Scorecard, Hydro Ottawa will continue to utilize SAIDI and SAIFI performance benchmarks, derived from historical averages, to establish reliability targets for the 2026-2030 period.

Attachment 2-5-3(A) - OEB Appendix 2-G - Service Quality and Reliability Indicators

(Refer to the attachment in Excel format)