TORONTO HYDRO®

Executive Summary and Investment Plan Overview

2025-2029 CUSTOM RATE APPLICATION

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1. OVERVIEW

Toronto Hydro-Electric System Limited ("Toronto Hydro" or the "utility") is proud to present its 2025-2029 Investment Plan (the "Investment Plan"), which proposes investments of approximately $5.9 billion in expanding, modernizing and sustaining the foundations of a safe and reliable grid to serve the current and future electricity needs of the homes, businesses and institutions of Toronto.

A fundamental shift – known as the energy transition – is underway. There is broad societal, academic and policy consensus that the demand for electricity will roughly double over the coming decades.[1] Customers are adopting new technologies powered by electricity at unprecedented rates as part of a societal-wide and international movement to reduce reliance on fossil fuels in order to mitigate the worst existential and economic impacts of climate change. Toronto Hydro needs to get ready for this electrified future now by preparing its grid and operations to serve increases in customer demand and offer customers greater choice with respect to their energy use, while also addressing other major challenges that persist: deteriorating infrastructure, a complex operating environment, rapid population growth, an evolving workforce, more frequent extreme weather events, and the rise of cyber threats.

As the trusted steward of the distribution system in Toronto, the utility recognizes that customers and stakeholders expect it to make the necessary investments to confront these challenges while also balancing price and service quality outcomes in both the near and long term. Toronto Hydro places paramount importance on fulfilling this responsibility. The Investment Plan makes the minimum investments necessary (the "least regrets" investments) to maintain key outcomes in the near term while also making paced and deliberate progress in readying the grid and utility operations for the future, irrespective of the path the energy transition takes. Investments with long lead times (e.g. infrastructure and human capital) must be made now to provide customers and policymakers a full range of options and choices for a decarbonized future, and the utility must have the flexibility to adapt plans as needed to be responsive to the varying degrees of uncertainty that still remain as to exactly when and how future demand will manifest.

Toronto Hydro developed the Investment Plan through an integrated and iterative planning process that considered customer feedback from start to finish, along with sophisticated system performance analysis, and other technical information produced by subject matter experts who have deep expertise in managing the electrical grid and its enabling operating systems. A record number of energy consumers – over 33,000 residential and business customers – reviewed the Investment Plan, and 84 percent supported the plan as presented or one that does even more to advance key outcomes.[2]

The Investment Plan builds on past improvements in safety, reliability and customer service outcomes, ensuring that this foundation of high-performance continues to be maintained while building a modern,

resilient grid for the decades to come.[3] It is organized around four investment priorities: (a) sustainment and stewardship (maintaining the foundations of a safe and reliable grid); (b) modernization (adopting new technology to improve system performance and reduce costs); (c) growth and electrification (connecting and serving growing demand for electricity); and (d) general plant (decarbonizing and keeping the business running efficiently).

Delivering customer value through performance is Toronto Hydro's ethos. To demonstrate its unwavering commitment, the utility is holding itself financially accountable for achieving key outcomes that matter to customers and deliver long-term value to ratepayers and stakeholders. The utility intends to track and transparently report its performance across 41 unique performance measures annually through its scorecards and regulatory filings, and introduced an innovative performance incentive mechanism which provides customers with an upfront rate reduction benefit of $65 million that the utility only earns back upon achievement of targeted objectives. Toronto Hydro understands that this is the level of accountability that customers and stakeholders deserve and expect.[4]

Toronto Hydro believes that it has struck the appropriate balance between maintaining the reasonable prices and reliable service levels that customers value while making the minimum necessary investments to respond to the imperatives of the ongoing energy transition so that the local grid can safely, reliably and efficiently serve customers for decades to come.

2. BACKGROUND & OPERATING CONTEXT

2.1 Corporate Overview

Toronto Hydro distributes electricity to Canada's largest – and North America's second fastest growing – city.[5] The utility serves over 3 million residents, 28 million visitors annually, approximately 100,000 businesses,[6] more than 35 hospitals and post-secondary institutions,[7] and the financial centre of Canada. Toronto has a dense urban core with approximately 11.5 million trees,[8] and it takes approximately 15,000 circuit kilometres of overhead wires and 13,800 circuit kilometres of underground wires[9] to serve the city's 630 square kilometres.[10] That is enough cable to cross the entire country of Canada nearly six times.

Toronto Hydro takes seriously the duty of serving such a complex service territory. The utility proudly confronts the associated challenges and does so in the safe and reliable manner that customers expect. In order to keep pace with these challenges, Toronto Hydro has spent the last decade renewing its aging and deteriorating grid, hardening the system against increasingly frequent and severe extreme weather, renewing its aging workforce, and investing in key areas such as customer service, cybersecurity and city growth to meet evolving customer requirements and external pressures.

These investments have lived up to customer and stakeholder expectations for fewer and shorter outages, better customer service and faster problem resolution, more self-serve and information-on-demand tools, an industry-leading safety performance record, and sustained efficiency benefits of a utility mature in its productivity journey.[11]

2.2 Energy Transition and Electrification

While Toronto Hydro is proud of its recent achievements, there is a paradigm shift underway. For nearly two decades, Toronto Hydro's demand has been largely flat, as investments in conservation and energy efficiency helped offset significant growth in Toronto. However, market evolution and public policy are changing this trajectory, driving customers to adopt advanced electrified technologies – such as electric vehicles (EVs), solar panels, home energy storage, heat pumps and electric water boilers – which are increasing customer demand and expectations for outcomes. The utility must evolve and invest in grid-side and operational technologies to address new imperatives flowing from these fundamental shifts in public policy objectives related to climate change, technological advancement, and customer needs and priorities.[12]

In light of these cultural shifts, all levels of government have adopted greenhouse gas (GHG) emission targets and incentives for fuel switching to clean energy sources.[13] The City of Toronto has declared a climate emergency requiring immediate and sustained action. TransformTO – the City's ambitious plan to achieve net zero community-wide emissions by 2040 – recognizes that most emissions come from two sources: buildings (approximately 58% of community-wide emissions, mostly from natural gas used for space and water heating) and transportation (approximately 33% of community-wide emissions, mainly from car and passenger trucks),[14] and has adopted strategies including:

- the Net Zero Existing Building Strategy,[15] which targets decarbonizing existing homes and business, including establishing emissions targets; and
- the Electric Vehicle Strategy, which targets having 30 percent of all registered vehicles in Toronto be electric by 2030, necessitating increased access to EV charging infrastructure across the city (primarily installed by Toronto Parking Authority with support from Toronto Hydro).[16]

The City of Toronto intends to reduce these sources of emissions through by-laws, policies and standards encouraging customer uptake of electrified technologies, including:

- the Toronto Green Standard, which sets sustainable design and performance requirements for new developments, with the goal of all new buildings being near zero emissions after 2030;[17]
- the Home Energy Loan Program,[18] Energy Retrofit Loans,[19] and Green Will Initiative,[20] which provide financial incentives and support services; and

- proposed implementation of a mandatory emissions performance standard that would require all existing buildings to reduce their emissions over time.[21]

These critical climate change mitigation and adaptation efforts demand a bigger, more efficient and more resilient system that will serve customers for generations to come. The grid must be ready when people plug in to decarbonize their lives, and these decarbonization imperatives are driving a fundamental transformation of the energy ecosystem within which Toronto Hydro operates.

However, this transformation introduces a new tension in the utility's planning process. How and when decarbonization and electrification materializes has degrees of uncertainty; whether the pace of change is faster or slower and which technologies customers and policymakers choose exist on a continuum of possible paths.[22] To fulfill its core mandate, Toronto Hydro must ensure that the grid and its operations are capable of serving Torontonians when and where they require electricity. This, by definition, requires the utility to invest ahead of demand materializing – whether that be demand in terms of load or service quality requirements. Hard asset investments and human capital investments both require a long lead time. Just as it can take years to build a new transformer station or complete an overhead rebuild project, it takes years to train and develop new employees, especially with advanced digital skill sets and capabilities.

In order to reconcile the tension between long-lead-time investments and uncertainty, Toronto Hydro has oriented itself around the principle of "least regrets investments" in designing its 2025-2029 Investment Plan to identify investments that can be made in the 2025-2029 period with a high degree of confidence that they will provide value to ratepayers irrespective of what the future holds.[23] This principle is discussed in more detail in the Business Planning & Customer Engagement section below.

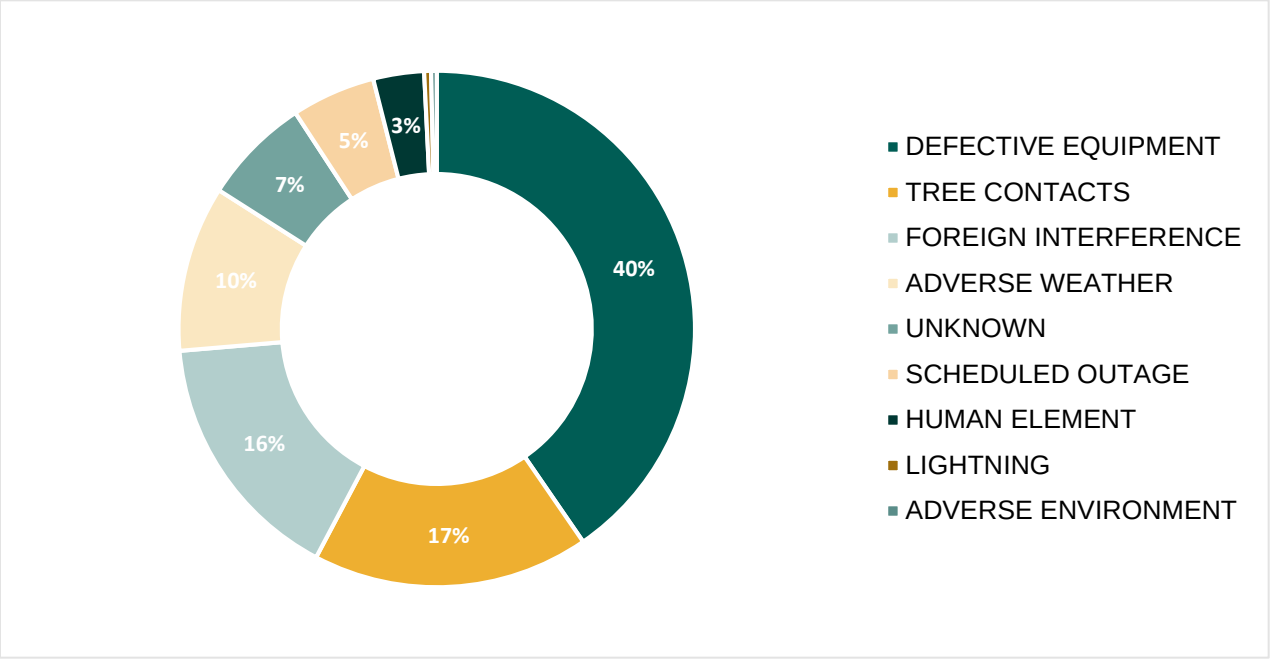
2.3 Material Challenges

At the same time that Toronto Hydro is responding to this paradigm-shifting change, the challenges of the past persist, and continued investments in the foundations of utility stewardship are still necessary to maintain the table stakes of a safe and reliable grid supported by responsive customer service. Toronto Hydro faces a number of distinct challenges in upkeeping, expanding and modernizing its distribution system. Each of the challenges discussed below exacerbate the energy transition discussed above and are explained in further detail throughout the 39 capital and operations programs that form the 2025-2029 Investment Plan.

2.3.1 Deteriorating Infrastructure

Toronto Hydro owns and operates a mature distribution system. Despite notable achievements in renewing the grid and improving reliability over the last decade, defective equipment continues to be a leading contributor to the duration of outages on the grid, representing approximately 40% of annual power interruptions experienced by customers based on duration (excluding Loss of Supply and Major Events).[24]

Figure 1: SAIDI (Excluding Loss of Supply & Major Events) Breakdown by Outage Cause 2018-2022



Approximately a quarter of the utility's grid equipment continues to operate past useful life. An additional 11 percent is expected to reach that point by 2030, unless the utility invests in upkeeping system infrastructure in the 2025-2029 period. Allowing the number of assets past useful life to grow increases the likelihood of power outages due to equipment failure (which are costlier and take longer to resolve), puts public and employee safety at risk, and leads to negative environmental outcomes. To manage these risks, Toronto Hydro must regularly inspect equipment to maintain its condition, and replace equipment that is in bad condition or performing poorly, before a failure occurs.[25]

2.3.2 Complex Operating Conditions

Toronto Hydro operates in a complex urban environment based on the dense nature of the city's population, the age of the city's infrastructure, and the nature of its customer makeup. These each pose material challenges in the utility's day-to-day operations.

Toronto is an urban service territory with a population density of 4,428 people per kilometer.[26] Table 1 below compares Toronto's population density with the five largest cities in Ontario:

Table 1: Ontario Cities Population Density[27]

Ontario's 5 Largest Cities by Population	Population (People)	Land Mass (km^2)	Population Density (People/km)
Toronto	2,794,356	631.1	4,428
Ottawa	1,017,449	2788.2	365
Mississauga	717,961	292.74	2,453
Brampton	656,480	265.89	2,469
Hamilton	569,353	1118.31	509

Based on Census Subdivision data from 2021 Census

The density of Toronto Hydro's service territory is unique even within an international context due to the ever-increasing number of high-rise buildings. As seen in the table below, New York City is the only urban centre in the world with more high-rise buildings than Toronto:

Table 2: International Cities High-Rise Buildings[28]

Rank	City	Country	High-Rise Buildings
1	New York City	United States	6,223
2	**Toronto**	**Canada**	**2,598**
3	Seoul	South Korea	2,578
4	Dubai	United Arab Emirates	2,360
5	Hong Kong	China	1,916
6	Tokyo	Japan	1,533
7	Busan	South Korea	1,311
8	Kyiv	Ukraine	1,275
9	Chicago	United States	1,247
10	Shanghai	China	1,236

As a dense and old city by North American standards, Toronto also suffers from a challenging combination of legacy standards, limited availability of rights of way for locating distribution equipment, underground congestion which drives a need for increased co-ordination with other utility providers (e.g. water, transit, natural gas, telecommunications), complex permitting and approval processes, longer drive times due to traffic congestion, limitations on the size and scale of distribution assets, and disruptions related to large-

scale local events. All of these considerations translate into significant planning and coordination requirements, adding both time and costs to system maintenance, renewal and enhancement investments.[29]

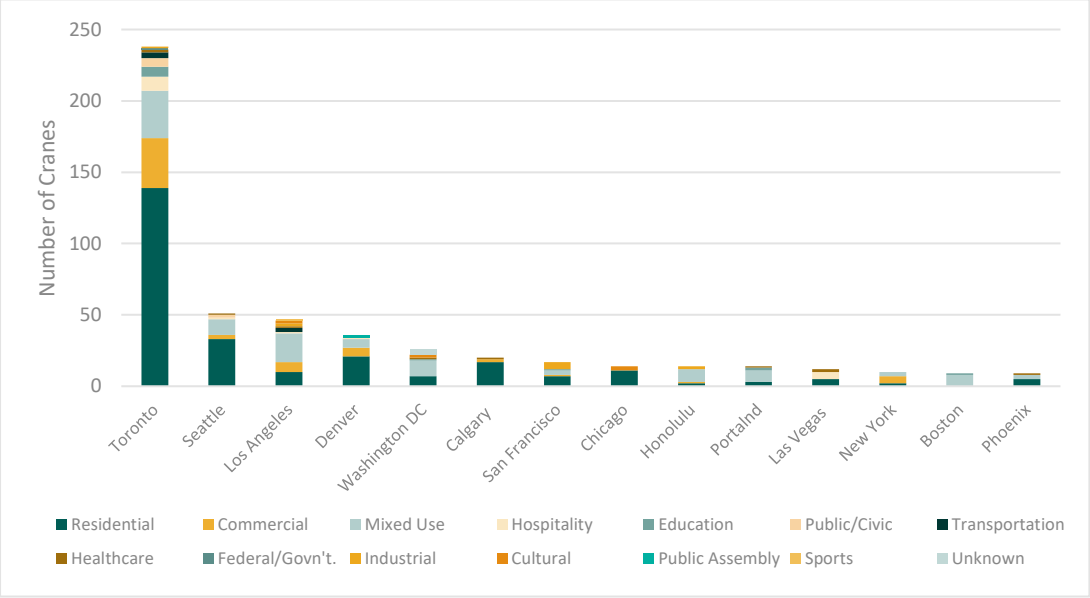
Beyond challenges created by service territory density and asset vintage, the unique customer make-up in Toronto's downtown core also places additional weight on Toronto Hydro's responsibility as a system operator. This customer composition – which includes major hospitals, the provincial legislature, and headquarters of banks, businesses and other critical financial institutions – necessitates elevated requirements for reliability and continuity of service to customers whose operations are critical to the sound functioning of the provincial and federal economy. As a result, Toronto Hydro's downtown system is designed and operated with a high-level redundancy, which in turn requires that additional prudent costs be incurred.[30]

2.3.3 A Growing City

The population of Toronto is also booming and expected to grow by approximately 23.8 percent between 2021 and 2031, a marked increase from the 6.8 percent growth over the prior decade (from 2011 to 2021).[31] The growth is concentrated in certain pockets, namely the downtown core and along transit corridors, and is oriented vertically with a continuing trend of high-rise developments. This has resulted in a marked need for new housing, transit solutions and infrastructure, all of which must be serviced by Toronto Hydro in the years to come.[32]

A salient data point that bears out this staggering growth is that Toronto has led the North American crane count since 2015 by a margin that is almost equivalent to the rest of the cities combined.[33]

Figure 1: RLB Crane Index - Q1 2023



In addition to high-rise buildings, this growth is also driving the development of sustainable new housing communities through the redevelopment of areas such as Downsview, the Golden Mile and the Port Lands, some of which are planned as net zero communities and to meet the highest performance measures of the Toronto Green Standard.[34]

The significant expansion of transit networks is also needed to support this population growth, and there are numerous new projects under construction in the city, including the Yonge North Subway Extension, Finch West LRT, Scarborough Subway Extension, Eglinton Crosstown West Extension, and the Ontario Line.[35]

Finally, this growth is also putting additional stress on the system through the incremental loads associated with technology and digitalization. In addition to organic growth, Toronto has become Canada's largest data center market, with 107 MVA of incremental demand load connected during the 2020-2024 period and 207 MVA forecasted to come online from 2025-2029.[36]

2.3.4 Extreme Weather

Extreme weather amplifies the challenge of distributing electricity to a mature, dense and rapidly growing urban city. Heat, high winds, heavy rainfall, freezing rain and heavy snowfall can cause major system damage and result in prolonged power outages. As evidenced by recent events (outlined in Table 3 below), extreme weather has become a regular operating condition that the utility must consider and manage in its day-to-day operations and long-term planning activities. With the frequency and intensity of adverse weather increasing due to climate change, Toronto Hydro's grid and operations must become more resilient to this challenge.

Table 3: Extreme Weather (January 2020 through May 2022)

Event	Description of Impact
High Winds Storm (May 2022)	• 142,052 customers impacted at its peak • 5 days to restore power to all customers
Flash Storm (August 2021)	• 20,000 customers impacted at peak • 2 days to restore power to impacted customers
Thunderstorm High Volume Event (July 2021)	• A line of thunderstorms with windspeeds in excess of 75 km/h • 12,000 customers were impacted at its peak • Service restored for the majority of customers within 2 days

Event	Description of Impact
High Wind Event (April 2021)	• Wind expected to reach ~95km/h • 22,000 customers impacted at its peak • 1 day to restore power to impacted customers
High Wind Event (November 2020)	• Winds in excess of 100 km/h • Estimated 8,000 customers impacted and 101 outages at its peak
Flash Storm (July 2020)	• Approximately 50-70mm of rain • 50,000 customers impacted at peak • Impacted customers restored within 2 days
Adverse Weather (January 2020)	• Approximately 60mm of rain, 5-15mm of ice and 90 km/h winds • 4,900 customers impacted at its peak • Impacted customers restored within 3 days

Adverse weather affects the distribution system in different ways. The underground system is vulnerable to flooding from extreme rainfall, while the overhead system is susceptible to extreme winds, freezing rain and wet snow, resulting in damage and outages. Broken trees and the weight of ice and snow accretions can bring lines, poles and associated equipment to the ground. For instance, in May 2022, an extreme wind event known as a derecho storm struck Southern Ontario and Quebec with 120+km/h winds. These extreme winds caused substantial damage to vegetation, which in turn took down overhead distribution wires and equipment, leaving approximately 142,000 customers (18% of Toronto Hydro's total customer base) without power at the peak of the storm. While the majority of customers were restored within 48 hours, it took approximately five days and cost approximately $2.35 million to restore power to all customers.[37]

2.3.1 Technology Advancements

Technology and innovation are also driving the need for a more dynamic system that is transitioning away from usual patterns of supply and demand towards more complex interactions and inputs in electricity generated and consumed. The role of the utility continues to evolve to support a smart grid ecosystem, comprising renewable and other distributed energy resources (DER) such as electric vehicles, solar panels and battery energy storage systems.

Customers are showing a continued interest in participating in the electricity system as both consumers and producers of power. DER connections have grown in recent years as a result of government policies and declining costs of technologies such as solar panels. By the end of the decade, Toronto Hydro expects to

have over 4,400 DER connection projects representing a total installed capacity of approximately 517 MW, an increase of approximately 67 percent compared to 2022.[38]

Integrating DERs into the grid provides customers more tools to actively manage their energy needs and enables the grid to be supplied by locally-generated renewable electricity resources. To advance these outcomes, Toronto Hydro must address the significant challenge of accommodating electrons that flow bi-directionally within a grid that was not built for this type of supply and demand. Equipment that has a high number of DER connections is more likely to experience unstable conditions that pose significant reliability and safety risks to the system and its users. Toronto Hydro monitors all DER connections closely for these factors to ensure that the grid remains safe and reliable for customers, and is building advanced grid capabilities to mitigate against these risks and enable DER adoption by customers in the future.[39]

Technological advancement also poses the challenge of managing a heightened risk of digital security threats, as cybercrime intensifies across Canada due to changing geopolitical dynamics. While smart grid systems, infrastructure automation, and other technological advancements being used by the utility and its customers offer many benefits, they also increase the exposure of the grid (and those connected to it) to greater risk of attack by hostile actors. This intensifying global challenge is particularly acute in major economic centers such as Toronto. Electric utilities are targets for security attacks because of the critical role they play in enabling essential services (e.g. hospitals, public transit, water treatment systems, communications and traffic management) and the databases of sensitive information they possess.[40]

Toronto Hydro needs to prepare itself to assist customers in taking advantage of technological innovation and advancements while also protecting itself and its customers from the risks they introduce.

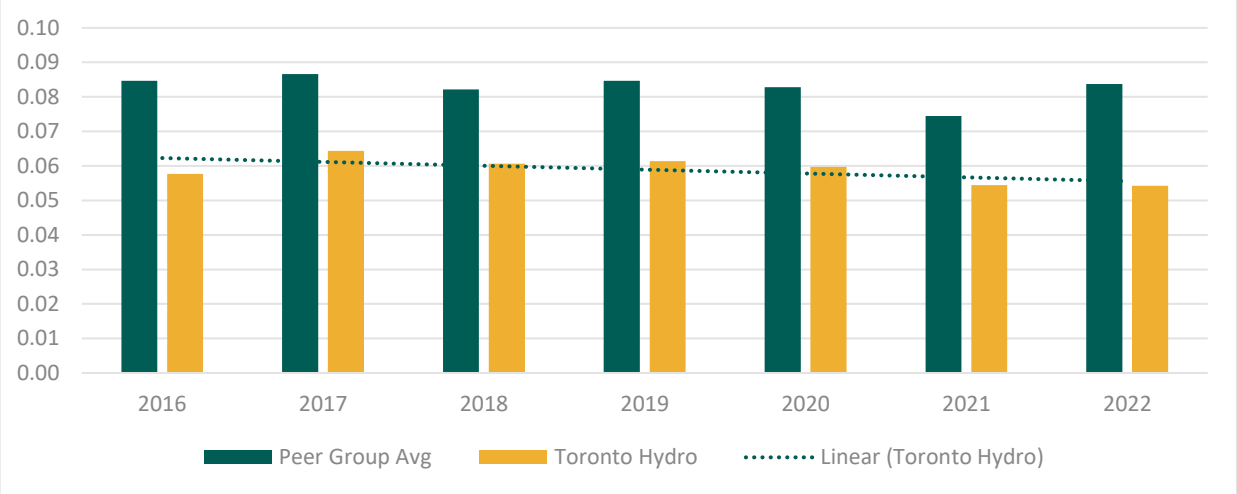
2.3.2 Workforce Challenges

Toronto Hydro relies on its highly-skilled and dedicated workforce to deliver safe, reliable and efficient electricity services to its customers. This workforce consists of approximately 70 distinct roles, including: dispatchers that run a 24/7 year-round control center to enable power to be restored as quickly as possible during unplanned events; [41] skilled trades that inspect, maintain and replace assets to remediate critical deficiencies; engineers and other technical experts that diligently plan, design, manage and optimize the grid's performance; information technology experts that keep critical systems reliable for operations and secure against intensifying cyber threats; [42] and customer service and other professionals with expertise in areas such finance, human resources, law and regulation that deliver positive customer experience and ensure the company operates in a compliant, safe and environmentally responsible manner.[43]

Since 2015, Toronto Hydro has served the needs of a growing city, evolving customer and policy demands, and an aging system while addressing intensifying challenges identified above, with a staffing complement

that is essentially flat from 2015 to 2024. Over this period, as Toronto Hydro's replenished a large wave of retirements, it also right-sized its workforce through continuous improvements in productivity, including harmonizing key jobs to create a more agile compliment of staff, and automating manual processes to increase employee output levels.[44] As shown below, compared to its Ontario peers, Toronto Hydro's workforce reflects the utility's past efforts to increase resource throughput and utilization.[45]

Figure 6: FTE per GWh of Load Served



As the utility takes least-regrets actions to expand and modernize the grid to be ready and equipped for a once-in-a century transformation of the energy system, it similarly needs to invest in resources with new and enhanced skill sets to get the work done safely and cost effectively. Just as it takes years to build new transformer stations or convert an area of the city served by legacy infrastructure to modern standards, human capital investments require long lead times, with the average employee undergoing multiple years of training and development to acquire the specialized skills and experience necessary to become a fully competent contributor. Due to the long lead time required for investment in both grid and human capital, Toronto Hydro must begin work today to be prepared to handle increased demand and consumption, bi-directional power flows, increased societal reliance on electricity, and enhanced customer expectations that naturally flow from these evolutions.

After nearly a decade of managing with a headcount plan that is essentially flat from 2015 to 2024, it is no longer possible for Toronto Hydro to meet its obligations without additional resources. Workforce levels need to grow by approximately 25 percent over the coming years for the utility to have the required resourcing capacity and capabilities to sustain the foundations of a safe and reliable grid and meet the imperatives of an urban city and customers who are increasingly relying on electricity to expand, digitize and decarbonize their footprint.[46]

As a result of past achievements in right-sizing its workforce and establishing dynamic partnerships with colleges and universities for direct recruiting and collaborative curriculum building, Toronto Hydro is ready to bring on the additional talent needed to meet the challenges of the next decade and prepare the grid and its operations to serve Toronto's growth and net zero objectives.

3. BUSINESS PLANNING & CUSTOMER ENGAGEMENT

While the preceding discussion sets the operating context for the current challenges facing Toronto Hydro, the utility recognizes that customers and stakeholders expect it to prepare a responsible multi-year plan that balances the need to confront those challenges with price and service quality outcomes. Accordingly, Toronto Hydro has a robust customer engagement program and planning process that ensures customer feedback is incorporated into its investment priorities, plans and projects.

Customer engagement is deeply embedded in the utility's planning process, ensuring that customer feedback informs Toronto Hydro's multi-year investment priorities and draws alignment with needs and expectations. The utility starts with an assessment of customer needs and preferences. Toronto Hydro then develops an initial capital plan that targets certain short and long-term performance goals for the system. From this point, an iterative planning process, including additional customer engagement, refines pacing and other assumptions until the right balance between price and service quality outcomes is met.[47]

The following sections discuss the stages of that engagement and planning process in further detail.

3.1 Assessing Customer Needs and Priorities

Toronto Hydro began the planning process by engaging its customers with a survey to understand their needs and preferences for the 2025-2029 period. The feedback from customers centered around the following core themes:

- **Price and Reliability** – Price and reliability continue to be top customer priorities, with reliability having become more important to residential customers over the last five years. Customers prioritize reducing the length of outages, with a particular focus on outages related to adverse weather. Key Account customers are more sensitive to power interruptions and prioritize reducing the total number of outages, including momentary interruptions.
- **New Technology** – Almost equally to price and reliability, customers expect the utility to invest in new technology that will reduce costs and make the system better in the future, as long as the costs and benefits are clear.
- **System Capacity** – Finally, customers expect Toronto Hydro to invest proactively in system capacity to ensure that high-growth areas do not experience a decrease in service levels. It is

worthy of note that the majority of Key Account customers surveyed have goals to reduce their net GHG emissions to zero, and expect Toronto Hydro to support them in meeting their climate objectives by ensuring that the system has capacity for growth and by providing them advisory services to support their decarbonization-through-electrification journey.[48]

These core themes then formed the basis of the planning work to come.

3.2 Integrated Planning

Toronto Hydro began integrating planning by adopting four strategic priorities for the plan, informed by customer feedback: (a) sustainment and stewardship (maintain the foundations of a safe and reliable grid); (b) modernization (adopt new technology to improve system performance and reduce costs); (c) growth and electrification (connect and serve growing demand for electricity); and (d) general plant (decarbonize and keep the business running efficiently). For each of these strategic priorities, Toronto Hydro set performance objectives aligned with customer feedback that provide value for customers and are meaningful to its operations, including to:

- invest enough in the sustainment of asset health and other leading indicators of asset risk to maintain reliability performance;
- prioritize investments in technology to modernize the grid and develop advanced operational capabilities to make the system better for the future; and
- invest proactively in system capacity to ensure that the grid is able to support future growth without compromising other outcomes like safety and reliability.

Through an iterative process that spanned over a year, Toronto Hydro system planners and experts worked diligently to identify the minimum investments necessary to meet these objectives and balance near and long-term service quality performance with price impacts for customers.[49] Achieving this important balance entailed both top-down direction with respect to price constraints and budget limits, and bottom-up analysis of system requirements and performance levels.

In this process, Toronto Hydro employed the principle of least regrets investment. Through the use of a new tool – the Future Energy Scenarios model – the utility modelled the grid impacts of a range of possible future peak demand scenarios based on the interaction between different policy, technology and consumer behaviour assumptions. Looking at these scenarios, Toronto Hydro was able to test whether the plan: (a) maintains reasonable rates without jeopardizing longer-term system performance outcomes; (b) provides value to customers regardless of what particular technologies are adopted to decarbonize key sectors of the economy; and (c) is able to accommodate a range of possible energy transition scenarios in the next decade so that the local grid can facilitate any path that customers or policymakers choose.[50]

Toronto Hydro also retained external experts to conduct assessments of its current performance, including performing studies on how Toronto Hydro compares to other peers on total cost productivity, reliability performance, compensation and benefits, unit costs, and information technology cost and maturity. The results, which are filed with this application, show that Toronto Hydro's cost performance is comparable to, and in many cases fares better than, its peers when key considerations, such as the density and congestion of its urban operating environment, are considered.[51]

3.3 Plan Validation and Finalization

In the spring of 2023, Toronto Hydro went back to customers for feedback on its draft plan to ensure that the utility met the right balance between price and progress towards outcomes that customers value. Through the use of a comprehensive online survey, more than 33,000 customers (representing roughly 4.3 percent of the total customer base) reviewed the draft plan and provided valuable input. Toronto Hydro was pleased to see such a high level of engagement by its customers. Nearly three times more people completed the workbook compared to the similar study conducted in the lead up to the last major rate application.

To help customers understand the investment priorities and express their preferences, Toronto Hydro broke down the draft plan into seven choices:

- **Modernization** – investments to build a smarter, more efficient and resilient grid for the future.
- **Growth** – investments to increase the grid's capacity to serve customers' growing electricity needs.
- **Sustainment: Reliability** – investments to manage reliability risk due to equipment failure.
- **Sustainment: Stewardship** – investments in the paced upkeep of equipment at or near end of life.
- **Sustainment: Standardization** – investments to standardize outdated equipment.
- **General Plant** – investments in fleet, facilities and IT infrastructure to run the business efficiently.
- **Decarbonization** – investments to reduce GHG emissions from Toronto Hydro's operations by electrifying fleet and facilities assets.

For each investment choice, customers were provided with the option of spending more or less for faster or slower progress towards key outcomes such as reliability, system health, customer service, efficiency and environment. This approach made it more accessible for customers to understand the key priorities of the plan and express trade-offs between price and other key outcomes. The feedback provided Toronto Hydro valuable insights into customer preferences, which was applied to refine and finalize the 2025-2029 Investment Plan.[52]

Table 2 below presents the rate impacts of the finalized 2025-2029 Investment Plan. For a typical residential customer, the proposal results in an average monthly distribution rate increase of $3.44 per month, per year, starting in 2025 through 2029. These rate impacts were considered by customers of all rate classes through the online survey, 84 percent of which on average supported the draft plan and its associated rate impacts.

Further, 18 percent of these customers supported a plan that does even more to advance key outcomes. These results validate that Toronto Hydro's 2025-2029 Investment Plan strikes the right balance between price and progress towards outcomes that customers value.[53]

Table 4: Summary of 2025-2029 Proposed Distribution Rate Change[54]

	2025	2026	2027	2028	2029	Monthly Average
Residential	$3.24	$3.40	$3.72	$3.97	$2.86	$3.44
Competitive Sector Multi-Unit Residential	-$1.27	$1.84	$2.18	$2.27	$1.64	$1.33
General Service <50 kW	$14.18	$9.24	$9.61	$10.67	$7.29	$10.20
General Service 50-999 kW	$235.35	$166.42	$175.01	$192.67	$150.45	$183.98
General Service 1,000-4,999 kW	$1,993.46	$1,466.61	$1,516.65	$1,599.65	$1,381.30	$1,591.53
	2025	**2026**	**2027**	**2028**	**2029**	**Monthly Average**
Large Use	$10,124.44	$5,874.70	$8,564.26	$9,530.78	$7,560.71	$8,330.98
Street Lighting	$15,917.30	$12,277.10	$20,691.10	$12,135.60	$15,226.00	$15,249.42
Unmetered Scattered Load	$2.96	$2.41	$2.49	$3.11	$2.01	$2.60

4. CAPITAL INVESTMENT PRIORITIES

Toronto Hydro considered the material challenges outlined above, the feedback received from customers, and the principle of least regrets investment to establish the following four strategic investment priorities for its capital plan:

- **Sustainment and Stewardship:** Risk-based investments in the renewal of aging, deteriorating and obsolete distribution equipment to maintain the foundations of a safe and reliable grid.
- **Modernization:** Developing advanced technological and operational capabilities that enhance value and make the system better and more efficient over time.
- **Growth & City Electrification:** Necessary investments to connect customers (including Distributed Energy Resources (DERs)) and build the capacity to serve a growing and electrified local economy.
- **General Plant:** Investments in vehicles, work centers and information technology (IT) infrastructure to keep the business running and reduce Toronto Hydro's greenhouse gas emissions.

These investment priorities are driven by critical needs that, if not adequately addressed, could impair Toronto Hydro's ability to deliver the outcomes that customers value. In some cases, these risks will materialize in the near term, such as lack of capacity to support urban intensification and economic development. However, in many cases, the risks will materialize in the medium to long term as the grid becomes more heavily utilized and more susceptible to longer and more frequent outages that are complex and costly to resolve. Toronto Hydro must invest in following priorities to manage these risks.[55]

4.1 Sustainment & Stewardship

Sustainment investments to renew aging and deteriorating infrastructure and standardize outdated equipment continue to be the largest part of the 2025-2029 Investment Plan. These investments must be made to maintain system performance, mitigate reliability, safety and environmental risks, and enhance the grid's capability to serve electrified technologies such as electric vehicles, solar panels, energy storage batteries, and electric heat pumps and boilers.

Past investments in the grid and operations have resulted in improvements in reliability, safety and environmental outcomes: the average duration of outages customers experience now compared to a decade ago was reduced by 26 percent over the last decade; the injury rate for employees has decreased by 60 percent; oil spills have been avoided; and the utility is on track to eliminate at-risk PCB transformers from its system by 2025. [56] [57] Investing in the performance and long-term stewardship of an aging, deteriorated and more highly-utilized system remains an urgent priority for the utility, alongside getting the grid ready to serve Toronto's growing electricity needs.

System health is a leading indicator of a safe and reliable grid. Allowing system health metrics – age and condition – to deteriorate would lead to the gradual but steady degradation of system performance. As an example, underground cables are the largest contributor to defective equipment outages and continue to present significant demographic challenges in the coming years, with approximately 73 percent of direct buried cables in the horseshoe area expected to be past their serviceable life by the end 2022.[58] Proactive investment in the replacement of these assets is a key part of sustaining the short and long-term performance of the grid.

Recognizing that customers are generally satisfied with current levels of reliability, and expect the utility to invest in new technology for the future,[59] Toronto Hydro right-sized the sustainment objectives of the Investment Plan to maintain (rather than improve) the overall health of the grid over the 2025-2029 period.[60] Maintaining system health metrics is necessary to sustain grid performance and prevent the accumulation of a backlog of equipment at risk of failure, or otherwise needing to be upgraded. Renewal investment backlogs are problematic not only because they greatly heighten system reliability risk; they also result in rate instability for customers, as well as high inefficiencies in work execution. Such inefficiencies stem in part

from performing more work reactively – which is typically higher cost – and in part because planned work becomes more expensive due to surges in material and labour needs that could otherwise be smoothed out through paced proactive investment. [61]

Keeping pace on renewal is also important for hardening the grid against more frequent extreme weather events and standardizing outdated equipment that poses barriers to electrification. For example, legacy 4 kilovolt stations and feeder equipment restricts the connection of large electrified loads and distributed energy resources. To prepare the grid for electrification, these assets must be gradually converted to new standards, and that work is being done in a paced way through sustainment investments that also deliver safety, reliability and environmental outcomes.[62]

The table below provides a summary of Toronto Hydro's sustainment capital programs:

Table 5: Sustainment Capital Programs

Capital Program/Segment	Investment ($M)
Area Conversions[63]	**$237**
Underground Renewal – Horseshoe[64]	**$476**
Underground Renewal – Downtown[65]	**$165**
Network System Renewal[66]	**$123**
Overhead Renewal[67]	**$273**
Stations Renewal[68]	**$218**
Reactive and Corrective Capital[69]	**$328**
Sustainment Capital	**$1,820**

4.2 Growth and City Electrification

The obligation to serve customers who want to connect to the grid is at the heart of Toronto Hydro's mandate as an electricity distributor. What accompanies that core obligation is the responsibility to make reasonable investments to prepare for future growth. This responsibility is more important than ever, as customers, communities and governments at all levels are actively embarking on an unprecedented transformation of the energy system to mitigate the worst impacts of climate change.

It is clear from studies that have been done locally, provincially and internationally that decarbonization-through-electrification imperatives are expected to drive demand for electricity in the next two decades. Experts indicate that demand could increase up to two to three times depending on the range of technologies and policy tools that are adopted.[70]

The particular drivers of demand are subject to dynamic forces of technological advancement, public policy imperatives and consumer behaviour. As an example, the decarbonization of existing housing and industrial buildings remains a policy puzzle, and a number of options are being considered to find suitable paths.[71] To manage this uncertainty and the cost consequences for customers, the utility must be measured-but-proactive in its investment plan (as both asset and human capital investments are long lead-time), and must be deliberate in sustaining and modernizing its grid and operations to ensure that it is ready to serve and enable customer choice in all scenarios.

As outlined above, Toronto Hydro has embraced this uncertainty by prioritizing investments that can provide value under all scenarios under the "least regrets" approach. This enables the utility to meet emerging challenges without having to wait for all unknown variables to stabilize. Based on its least regrets investment philosophy, the 2025-2029 Investment Plan accommodates an increase of 23 percent in system peak demand, which includes electrification of transportation (EVs) across residential, industrial and commercial sectors, as well as major transit projects like the Ontario Line and Scarborough Subway Extension, and redevelopment plans for the Downsview, The Port Lands and Green Mile communities.[72]

The 2025-2029 Investment Plan anticipates a material increase to the customer connection portfolio (consistent with the trend observed in recent years) and expands stations capacity to alleviate future load constraints due to growth resulting from EV uptake, digitalization of the economy (e.g. data centers and digital transformations of existing sectors), and city growth and redevelopment (e.g. urban densification and transit expansion). The 2025-2029 Investment Plan also optimizes near-term system capacity through active management measures such as load transfers and balancing, equipment upgrades, and the targeted use of non-wires solutions – both demand-side measures that leverage customer DERs as well as grid-side technologies such as renewable-enabling energy storage systems.[73]

By the end of this decade, DER capacity is expected to increase by approximately 67 percent.[74] Getting these resources safely connected to the grid is necessary to enable greater choice and support customers in achieving their electrification objectives (e.g. ESG, net zero, environmental conscientiousness, home/business resiliency). Moreover, integrating these resources into the system is critical to right-sizing system expansion investments and developing a grid that is more resilient in the future as a result of greater levels of local power supply. To accommodate increasing volumes of connections in this area, the 2025-2029 Investment Plan ensures control and monitoring capabilities for all distributed generation and addresses constraints on restricted feeders through traditional investments such as station bus-ties and alternative technologies such as energy storage.[75]

While there is certainty that fundamental change is ahead, there are still degrees of uncertainty about how that change will unfold. For example, government incentives or market evolution could further accelerate

customer adoption of electric vehicles or other fuel-switching technologies. Similarly, provincial procurement programs could create an expanded role for DERs in the deployment of coordinated infrastructure solutions to meet Ontario's energy needs.[76] As a result of such external factors, the pacing and level of certain demand-driven expenditures and revenues can change and materially deviate from the forecast. To that end, Toronto Hydro proposes a flexibility mechanism (known as a variance account) to reconcile differences between forecasted and actual demand-driven costs and revenues. During a time of unprecedented change and transformation in the economy and energy system, it is key to protect both ratepayers and the utility from structural unknowns that could have a material impact on the plan.[77]

The table below outlines the programs that enable growth and city electrification:

Table 6: City Growth and Electrification Capital Programs

Capital Program	Investment ($M)
Customer Connections[78]	$476
Externally Initiated Plant Relocations & Expansions[79]	$76
Load Demand[80]	$236
Generation Protection, Monitoring and Control[81]	$35
Non-Wires Solutions[82]	$23
Stations Expansion[83]	$173
Growth Capital	**$1,020**

4.3 Grid Modernization

Toronto Hydro's grid modernization strategy focuses on accelerating the deployment pace of digital field and operational technologies that can deliver future benefits to customers. These benefits include better outage restoration capabilities to improve grid resilience, and enhanced operational flexibility to manage a more heavily utilized system with increasing bi-directional power flows. Grid modernization investments, once fully implemented and integrated in the next decade, are expected to yield a material step-change improvement in reliability and operational efficiency, to help offset the added reliability and cost pressures associated with electrification.[84]

The modernization plan lays the groundwork for grid automation (commonly known as the self-healing grid) in the horseshoe area of the system starting in 2030 to provide the enhanced levels of reliability and resilience that customers will expect as they electrify their homes and business at a lower cost compared to traditional alternatives. To improve resiliency against major disruptions (e.g. extreme weather; loss of supply) for vulnerable parts of the system, the modernization plan also includes investment in: (a) the targeted

undergrounding of equipment to harden vulnerable areas of the overhead system against more frequent and extreme weather events, and (b) enhanced configuration options for the downtown network, which serves critical loads such as major hospitals and financial institutions.

Toronto Hydro's journey towards an intelligent self-healing grid is being implemented through an Advanced Distribution Management System (ADMS), a multi-faceted software platform with advanced capabilities and connected applications that integrate analytics, real-time data and control algorithms to optimize distribution network operation. The system provides a holistic view of the grid and encompasses advanced applications such as Outage Management System (OMS), Fault Location Isolation and Service Restoration (FLISR), and Volt/Var Optimization, which allow swift detection and response to outages and grid disturbances, and enable reliable and efficient management of DERs by optimizing voltage levels and reactive power flows throughout the distribution system. [85]

Through operational technology such as sensors, switches and software, Toronto Hydro can better monitor, predict and control the flow of electricity across the system. These capabilities enable the utility to reduce the number and length of outages customers experience, and also pave the way for a more interactive, bi-directional grid that enables customers to choose various technologies to produce, store and sell power back to the grid.[86] In addition, Toronto Hydro plans to invest in overhead and underground line sensors and other condition monitoring and control equipment that provide the utility real-time information about critical assets in the field, and enable more cost-effective system planning and operational decisions.[87]

Modernization investments also create a foundation for the kinds of advanced, real-time and predictive analysis that would be fundamental to Toronto Hydro's evolution towards a Distribution System Operator (DSO) model, if and when such a model is either imposed or offered to distributors in an effort to further enable energy transition outcomes. In such a model, Toronto Hydro would be expected to safely and reliably coordinate, dispatch and optimize thousands of behind-the-meter generators and flexible loads in order to help maximize the value created by the local energy system for customers, including maximizing the penetration and utilization of non-emitting energy sources. While the policy environment surrounding the role of DERs in the energy transition remains unsettled, the grid modernization capabilities advanced by the 2025-2029 Investment Plan create the foundation for this possible future while also delivering many other tangible benefits to customers irrespective of the DSO policy framework.[88]

The table below outlines Toronto Hydro's modernization capital programs:

Table 7: Modernization Capital Programs

Capital Program/Segment	Investment ($M)
System Enhancement[89]	$151
Network Condition Monitoring and Control[90]	$6
Metering[91]	$248
Overhead Resiliency[92]	$86
Stations Control and Monitoring[93]	$65
IT Cyber Security & Software Enhancements[94]	$95
Modernization Capital	**$651**

In addition, to the modernization capital investments summarized above, Toronto Hydro proposes to establish a $16-million 2025-2029 Innovation Fund to support the design and execution of pilot projects focused on testing innovative technologies, advanced capabilities, and alternative strategies that enable electrification grid readiness and facilitate DER integration. The Innovation Fund supports utility investment in innovation work that is more early stage, exploratory and developmental in nature, where the outcomes are less certain, but the potential benefits for the system and customers could be significant. While the benefits of individual projects may not be immediate or certain, and some initiatives may prove to be more or less fruitful than others, this type of work is nevertheless critical to achieving real innovation during a time of transformation in the energy sector.[95]

4.4 General Plant

Toronto Hydro needs to maintain facilities, fleet and information technology (IT) assets and infrastructure to enable efficient business operations. To get maximum value out of its work centers, stations buildings, physical security systems, and fleet, the utility monitors and manages asset age and condition with a view to optimizing total lifecycle costs.

In addition to four work centers that provide the necessary conditions for employees to work effectively, Toronto Hydro manages a broad portfolio of approximately 185 stations which house and protect critical equipment such as cables and transformers. Like electrical equipment, facilities assets that are in poor condition pose an increased risk of failure, putting key outcomes such as safety, reliability, customer service and productivity at risk. For example, if a station building has a leaking roof or foundation that allows water to infiltrate, there could be permanent damage to distribution equipment, leading to lengthy and costly power interruptions and posing hazards to workers and the public.[96]

Investments in the renewal and maintenance of facilities assets enable the utility to deliver its services in a safe, reliable and sustainable manner. In addition to these table stakes, Toronto Hydro must also address emerging needs to provide greater resilience against physical threats such as vandalism and natural threats such as extreme weather. The utility plans to address these needs through targeted investments in renewing stations buildings and work centres (e.g. exterior cladding, windows and roofs where critical equipment is housed), and physical security systems (e.g. network-based cameras and access card readers).

Toronto Hydro crews also need safe and reliable vehicles to execute a wide range of system capital and operations and maintenance work programs. Toronto Hydro's fleet investments include heavy duty and light duty vehicles and equipment (e.g. forklifts and trailers). These vehicles transport employees and materials to and from job sites, perform distribution work onsite, and serve as working space for field employees. Fleet vehicles must be available to support these operations in a safe and efficient manner. Toronto Hydro's fleet investments aim to optimize vehicle operating costs, minimize fleet downtime due to repairs, increase vehicle efficiency and safety, and, importantly, reduce emissions.[97]

Toronto Hydro is committed to reducing its direct GHG emissions (referred to as Scope 1 emissions) in order to mitigate the impacts of climate change and reach "net zero" by 2040. The utility intends to reduce the emissions produced by its fleet by gradually increasing its complement of electric and hybrid vehicles. Similarly, Toronto Hydro has a paced plan to reduce its buildings emissions by decreasing its natural gas consumption using a combination of energy efficiency measures and fuel-switching projects to replace natural gas fueled heaters with electric heating systems.[98]

Finally, General Plant includes investments in information and operational technology (IT/OT) assets that support a number of business applications and systems which are essential to conducting day-to-day operations such as managing field crews, responding to outages and enabling customer self-serve tools. When these systems are not available, customers service levels decrease, power outages and operational disruptions take longer to fix, and safety of the public and employees is put at risk. Toronto Hydro must invest in upkeeping its IT/OT assets to ensure they remain highly reliable and available for conducting critical operations.[99]

The table below outlines Toronto Hydro's general plant capital programs:

Table 8: General Plant Capital Programs

Capital Program/Segment	Investment ($M)
Enterprise Data Centre[100]	$72
Facilities Management and Security[101]	$145

Capital Program/Segment	Investment ($M)
Fleet and Equipment Services[102]	$44
Information and Operational Technology[103]	$206
General Plant Capital	**$467**

5. OPERATING INVESTMENT PRIORITIES

The capital investment priorities outlined above are enabled by a suite of operational programs that work together with the capital programs to achieve the key objectives of the 2025-2029 Investment Plan and deliver the outcomes that customers value. This part of the plan is comprised of 19 operational programs summarized in Table 9 below that, among many other things, support the execution of an expanded capital program, address a wide range of legal and regulatory requirements, enable the delivery of timely and satisfactory customer services, and maintain the grid in good working order.

These programs are executed by high-skilled and knowledgeable Toronto Hydro employees and effective third-party resources. As mentioned previously, after nearly a decade of managing operations with a headcount plan that is essentially flat from 2015 to 2024, the utility needs to expand its workforce capacity by approximately 25 percent to sustain foundations of a safe and reliable grid and meet the imperatives of an urban city and customers who are increasingly relying on electricity to expand, digitize and decarbonize their footprint.[104]

The execution of increased volumes of work is a key driver of the workforce requirements across a number of functions and roles within the utility's operations, as summarized below and further detailed in the underlying evidence. The challenge of increasing volumes of work is further compounded by more complex workloads. Priorities such as grid modernization, increased receipt and use of data, pursuit of non-wires solutions to defer or displace the need for traditional infrastructure, intensifying cybersecurity threats, and increased connection and management of DERs all add to the complexity of work completed by Toronto Hydro's devoted staff.

Higher volumes and more complex connection projects necessitate incremental resources in the system planning and work execution functions, as well as back-end support functions such as finance and legal to ensure that project costs are properly accounted, review connection agreements, maintain compliance with regulatory requirements, and resolve customer inquiries in a timely manner.

As traditional energy consumer models evolve to a paradigm where customers are plugging in electrified technologies and are more actively participating in energy management through the use of DERs, Toronto

Hydro's customer-interfacing operations must also follow suit to address emerging needs and requirements, such as: connecting electric vehicles, heat pumps and DERs of varying size and scale; accessing energy data and analytics; and new channels of digital customer information, communication and interaction.[105]

In addition to attracting and retaining the minimum resources necessary to carry out the work and deliver customer outcomes in next rate period and beyond, the OM&A plan addresses other key operational requirements, including:

- integrating cloud computing and non-wires solutions into operations;
- protecting customers' data and the grid against intensifying cybersecurity threats driven by rapid technology advancements and changing geopolitical dynamics;
- complying with new or expanded legal and regulatory requirements, including customer service, safety and environmental obligations;
- maintaining safe, reliable and effective operations across a multitude of key utility functions, including Emergency Response, Supply Chain, Fleet, Facilities and Information Technology ("IT");
- addressing a variety of externally-driven costs, including insurance premiums, bad debt expenses and regulatory costs; and
- keeping up with asset maintenance requirements to ensure the grid remains safe and reliable for customers.

The table below provides a summary of Toronto Hydro's OM&A programs.

Table 9: OM&A Programs

OM&A Programs	Costs ($M)
Preventative and Predictive Overhead Line Maintenance	46.8
Preventative and Predictive Underground Line Maintenance	34.6
Preventative and Predictive Station Maintenance	40.7
Corrective Maintenance	156.8
Emergency Response	136.0
Disaster Preparedness Management Program	10.1
Control Centre Operations	47.3
Customer Operations	68.2
Asset and Program Management	83.2
Work Program Execution	88.6
Fleet and Equipment Services	49.0
Supply Chain Services	122.5

OM&A Programs	Costs ($M)
Facilities Management	145.1
Customer Care	263.2
Human Resources, Environment and Safety	121.6
Finance	138.7
Information Technology	344.6
Public, Legal and Regulatory Affairs	160.2
Charitable Donations and LEAP	8.5
Common Costs and Adjustments	(4.2)
Allocations and Recoveries	(205.2)
Total Operational Plan	**1,856.3**

5.1 Operational Priorities

The utility's operations programs enable critical grid and customer service functions, such as: responding to emergency events and managing planned outages; planning, designing and executing work programs to keep the grid safe and reliable; procuring the necessary materials and services to get work done; and leveraging technology solutions such as non-wires and cloud-based software to displace capital investments.

Responding to emergency events and managing planned outages

The Control Centre Operations program facilitates the safe and reliable operation of the utility's distribution grid through real-time system control and monitoring activities on a 24/7 year-round basis. [106] This program coordinates system switching and restoration work through the utility's control center to mitigate the effects of power outages and enable safe equipment to be de-energized for capital and maintenance work execution.

In the event of an emergency, the utility has a 24/7 Emergency Response program which carries out activities such as dispatching specialized field crews to respond and restore power after severe weather-related events, or other emergencies reported by Toronto EMS or members of the public. [107] This program works together with the Disaster Preparedness Management program to ensure that Toronto Hydro is well-prepared to respond to and recover from larger-scale incidents, such as the recent COVID-19 pandemic, at both the distribution system and corporate levels. Leveraging its pandemic readiness plans and robust incident management framework, Toronto Hydro was able to rapidly adapt its operations when the COVID-19 pandemic suddenly hit, in order to continue to serve customers reliably while protecting the safety of its employees, third-party resources and the public.[108]

Planning, designing and executing capital and maintenance work projects

Toronto Hydro's Asset and Program Management function supports the planning and designing of capital and maintenance work projects. Through this program, Toronto Hydro monitors and analyzes the performance of the distribution system, asset condition and system capacity, and identifies system needs. This analysis forms the basis of Toronto Hydro's capital and maintenance plans, and contributes to individual projects that together enable the utility to achieve its investment objectives.[109]

Toronto Hydro's Finance program oversees the development of the utility's annual and long-term budgets and financial projections. This includes providing regular reports and analysis to maintain compliance with external reporting and audit requirements. By providing these reports, Toronto Hydro is able to track and monitor the execution of its capital plan in accordance with professional standards. The team also collaborates with operational groups to develop, implement and optimize internal controls and processes to maintain the integrity of financial data and improve operational efficiency. These services are essential to Toronto Hydro's ability to comply with legal and regulatory obligations, to produce accurate financial statements, and to successfully deliver the utility's capital work plans.[110]

The oversight, administrative training and other functions performed in the process of executing Toronto Hydro's capital and maintenance work programs are performed by the Work Program Execution program. This program includes administration, planning and execution for the portion of Toronto Hydro's capital and maintenance programs completed by third-party resources. It also includes administrative and support costs for work completed by internal labour – including training costs for employees and apprentices as part of the utility's trade school.[111]

Through its Community Relations functions, Toronto Hydro has comprehensive processes and protocols for communicating information to customers concerning planned capital work, in order to provide a better understanding of the capital program and to help prepare customers for work at or near their property.[112]

Procuring the necessary materials and services to complete work projects

The Supply Chain Services program undertakes procurement and warehousing activities that support the execution of Toronto Hydro's capital and operating programs. This includes facilitating the timely and cost-effective acquisition of services, materials and equipment, maintaining sufficient inventory to ensure uninterrupted work execution, and managing material handling costs.[113]

Procurement activities are supported by the Legal Services function, which provides commercial law advice relating to the purchase of goods and services and other transactions with external vendors.[114] Legal Services assists with review, negotiation and drafting of commercial contracts, including purchase agreements, agreements for professional services, master contractual arrangements for long-term vendors,

and other bespoke agreements as may be required to give effect to the utility's intentions in the applicable commercial transaction.

Leveraging technology solutions to address system needs

Technological advancements offer new digital tools and smart grid solutions to address system needs and deliver cost-effective customer services. Taking advantage of these opportunities requires investment in both capital assets (hard infrastructure like sensors, switches and reclosers, and intangibles like software systems) and in resources (human capital) with new and enhanced skill sets to install and integrate field technology (and analyze the valuable data it provides) into day-to-day operations and system planning functions.

For example, under the Asset and Program Management program, Toronto Hydro staff facilitates the development, integration and implementation of the Grid Modernization Strategy and associated roadmaps. This strategy includes advanced asset analytics that depend on cloud-enabled software solutions and grid readiness activities that leverage technology such as DER management systems to enable non-wires solutions and optimize existing grid capacity. [115]

Non-wires solutions refer to operating practices, activities or technologies that enable the utility to defer the need for specific distribution capital projects (at a lower total cost to ratepayers) by reducing system constraints at times of maximum demand in specific grid areas. Typically, these solutions leverage the use of DERs, often in partnership with utility customers or enabling third-parties. Local Demand Response (established in 2015) is the utility's mature non-wires solutions program to alleviate capacity constraints in high-growth areas of the grid by identifying opportunities where flexible demand response capacity can be procured from customers and third-parties to address system needs cost effectively.[116]

Further, Toronto Hydro is adopting cloud-based software solutions to address business needs and requirements, such as implementing advanced digital tools needed to enable the utility's Grid Modernization Strategy. These subscription-based services provide access to software applications and other IT systems through an internet connection and shared cloud computing framework. As IT vendors move towards offering more (or exclusively) cloud-based solutions, Toronto Hydro must keep pace with these industry trends.[117]

5.2 Maintenance Priorities

The utility's maintenance programs enable upkeep of distribution and general plant assets by: inspecting and maintaining distribution equipment on routine cycles; remediating asset deficiencies and safety risks; maintaining general plant equipment in good working order; and protecting the grid against intensifying cyber threats.

Inspecting and maintaining distribution equipment on routine cycles

Toronto Hydro's preventative and predictive maintenance programs perform critical work to sustain the integrity of overhead line, underground system, stations and metering infrastructure. This includes inspection and maintenance of equipment for signs of potential failure. These programs are focused on preserving and maximizing the performance of assets over their expected useful life while mitigating a number of key risks. These programs are also designed to minimize overall asset lifecycle costs, maintain safety outcomes for Toronto Hydro work crews and the public, and ensure environmental stewardship and compliance with legal and regulatory obligations.[118]

Remediating asset deficiencies and safety risks

Through its Corrective Maintenance Program, the utility undertakes actions to address deficiencies or substandard conditions across the entire distribution system. This includes signs of potential failure or other risks identified through activities undertaken as part of the Preventative and Predictive Maintenance programs in the course of responding to emergencies. Corrective Maintenance activities are generally higher priority, cover short planning horizons (given the risks that deficiencies and substandard conditions can pose if left unaddressed), and involve repairing and restoring assets to their normal operating conditions through maintenance or refurbishment. Toronto Hydro's primary objective in this program is to uphold safety, environmental integrity and reliability by correcting or repairing deficiencies or substandard conditions on the distribution system.[119]

Maintaining general plant equipment in good working order

Toronto Hydro relies on its fleet,[120] facilities,[121] and IT assets to keep the business running efficiently so the utility can perform its work and deliver customers services safely and reliably.[122] Through its Fleet and Equipment Services Program,[123] Facilities Management Program[124] and IT program,[125] the utility aims to ensure that its vehicle, facilities and IT assets are maintained in good working order. The Fleet and Equipment Services Program ensures that the utility's fleet of 456 vehicles and other work equipment operate safely and reliably at the lowest overall lifecycle cost. The Facilities Management program provides workspace and property management services that enable Toronto Hydro's employees and dedicated third-party resources to perform their work in optimally configured, safe and structurally sound surroundings. For IT hardware and software assets, the IT program maintains the reliability and availability of critical IT systems and infrastructure that the utility relies on to carry out its daily operations.

Protecting the grid against intensifying cyber threats

IT infrastructure and systems must be kept secure to mitigate the risks of cyber-attacks that can disrupt distribution operations, compromise sensitive data, or result in other types of customer interruptions. Cybersecurity controls and software applications are periodically refreshed and enhanced to protect IT systems that support core operations, mitigate emerging digital threats and vulnerabilities, and minimize the

risks of system failure.[126] These investments take the form of asset maintenance, licensing and subscription fees, and resources with the specialized skills needed to support and maintain IT infrastructure security.

5.3 Administrative Priorities

The utility's administrative programs enable the execution of critical grid functions and timely customer service functions, including: connecting customers to the grid in a timely and efficient manner; providing quality customer service and satisfaction; maintaining proactive compliance with legal and regulatory requirements; and ensuring a safe and productive workforce and environmentally responsible operations.

Connecting customers to the grid in a timely and efficient manner

The Customer Operations program ensures that customers are able to obtain timely connections to the grid and provides a consistent and efficient customer experience in that regard. This work includes handling customer requests and communications relating to connection and service upgrade requests, and managing these projects from intake through to completion via a single point of contact to offer customers an effective experience.[127]

The Public, Legal and Regulatory Affairs program facilitates third-party coordination with public infrastructure agencies and partners, and enables capital projects and relocation projects to move forward efficiently. In particular, for customer connections requiring expansion, the Legal Services team drafts, reviews and negotiates connection agreements to maintain compliance with the Distribution System Code and support effective connection processes. The Legal Services function also works closely with the construction, asset management, stations and facilities operational units to address the requirements of the utility and its counterparties related to property access, occupancy, and equipment maintenance and repair. New access and occupancy rights are obtained where necessary, in particular for new infrastructure builds or connections.[128]

Through Asset and Program Management, Toronto Hydro ensures that the grid has sufficient capacity to accommodate customers' growing demand for electricity and the capability to connect to DERs in Toronto Hydro's service area.[129] In addition, the Standards and Policy function develops the utility's design and construction standards, manages the utility's Conditions of Service, and supports the offer to connect process.

Providing quality customer service and satisfaction

Toronto Hydro's customer service programs respond directly to the needs of the utility's large and diverse customer base. The Customer Care program oversees the utility's mobile and digital self-service portal known as the Customer Self Service (CSS) portal, which offers customers 24/7 online access to their account, including the ability to download bills, switch electricity price plans and chat with a Customer Care

representative.[130] In addition, the program manages a Contact Centre that handles approximately 343,000 telephone calls and 70,000 written (paper mail, fax and email) inquiries per year.[131]

Toronto Hydro's Key Accounts function engages with larger business and institutional customers, such as priority loads (such as hospitals and financial institutions), essential public services and developers. The Key Accounts team manages relationships with these customers and acts as a single point of contact to serve the distinct needs of Key Account customers, including facilitating planning and coordination for major capital and maintenance projects and addressing reliability and power quality issues and concerns.[132]

Toronto Hydro's Media and Public Relations team communicates with customers and other stakeholders through a number of different channels (including the utility's website and social media channels) to ensure that customers receive timely information about programs, services and operations, including power outages.[133]

Maintaining proactive compliance with legal and regulatory requirements

The Public, Legal and Regulatory Affairs program addresses Toronto Hydro's extensive legal and regulatory requirements. The objective of this program is to maintain proactive compliance with these oblications through expert management of the ongoing and evolving external demands and expectations of the legal, regulatory and public policy environment within which Toronto Hydro operates.[134] Similarly, the Finance Program provides robust governance and controls over financial processes to maintain compliance with applicable statutory and regulatory financial reporting requirements.[135]

The Human Resources and Safety Program facilitates Toronto Hydro's compliance with applicable legislative and regulatory requirements such as the Utility Work Protection Code, Electrical Utility Safety Rules, and Occupational Health & Safety Act and Regulations ("OHSA").[136] In addition, the Environmental, Health, & Safety Management System ("EHSMS") mitigates risks and achieves the company's objectives relating to health, safety and environmental performance.[137]

Finally, Toronto Hydro's Customer Care program ensures ongoing functionality and compliance with legislative and regulatory requirements of the meter-to-cash process through a system of robust internal controls and procedures that are reviewed on an annual basis. These safeguards enable the utility to identify any billing errors or irregularities in a timely manner and promptly take corrective actions.[138]

Ensuring a safe and productive workforce and environmentally responsible operations

Toronto Hydro's Human Resources, Environment and Safety ("HRE&S") program provides broad human resource management services to the utility. This includes managing the employee lifecycle through the processes of recruitment, compensation and benefits, onboarding, performance management, training and leadership development, labour relations, and employee communications and engagement. All of these

activities are carried out within a culture of preserving employee wellness, health and safety, and ensuring environmental sustainability.[139]

6. PERFORMANCE ACCOUNTABILITY AND REPORTING

Toronto Hydro holds itself accountable to customers through its performance and transparent reporting of the outcomes that matter most. Over the last decade, the utility improved its performance on a number of key service quality measures, including customer first contact resolution, telephone calls answered on time, new residential and small business services completed on time, and billing accuracy.[140] At the same time, Toronto Hydro achieved the following notable improvements in cost efficiency:

- the reduction of square footage per employee by 40% through a facilities consolidation strategy that is expected to return more than $200 million to customers by the end of this decade, resulting in an annual credit of approximately $132 on the average residential customer's bill from 2016 to 2029;
- the reduction of its fleet by 163 vehicles (since 2017), resulting in avoided total lifecycle vehicles costs of $26 million (a net 27% reduction);[141]
- increasing the number of customers on eBills by nearly 500% (since 2013), reducing paper that stacks up taller than the CN Tower, and avoiding mailing and postages costs of $4.4 million (as of the end of 2022);[142] and
- the delivery of over 30 distinct productivity initiatives which yield material benefits for customers, including over $23 million in costs the utility expects to avoid or reduce by the end of 2024.[143]

The 2025-2029 Investment Plan maintains Toronto Hydro's strong record of performance against 29 service quality measures tracked by the Ontario Energy Board – the independent regulator that sets electricity distribution rates for customers and oversees the utility's performance. The plan also extends accountability to emerging areas of importance for customers through 12 custom metrics that measure results such as strengthening the utility's defense against physical and cyber-attacks, reducing the company's GHG emissions, providing customer satisfaction in key interactions with the utility, and procuring flexible system capacity to address distribution system needs more cost effectively and develop DER integration capabilities for the future.

Overall, to track its effectiveness in achieving the plan's objectives and continuing to deliver high service quality value to customers, Toronto Hydro intends to measure its results through a performance outcomes framework that reports on 41 distinct measures annually.[144]

In addition to reporting performance on these measures through its public website and regulatory filings, Toronto Hydro intends to link its 2025-2029 Custom Scorecard to an innovative performance incentive

mechanism (PIM) that holds the utility financially accountable for delivering results across four key areas of focus: (1) System Reliability and Resilience; (2) Customer Service and Experience; (3) Environment, Safety and Governance; and (4) Efficiency and Productivity.

Inspired by similar mechanisms being used in other leading jurisdictions such as New York and the U.K, the PIM provides customers an upfront rate reduction benefit of approximately $65 million that the utility can earn back by achieving set objectives. This proposal is part of Toronto Hydro's ongoing commitment to transparency and accountability for outcomes that provide value to customers and stakeholders now and into the future.[145]

Table 10: 2025-2029 Custom Scorecard Measures

Performance	Measures
System Reliability & Resilience	Outage Duration
	Outage Frequency
	System Security Enhancements
Customer Service & Experience	New Services Connected on Time
	Customer Satisfaction (Post Transactional)
	Customer Escalations Resolution
Environment, Safety and Governance	Total Recordable Injury Frequency (TRIF)
	Emissions Reductions
	ISO Compliance and Certification
Efficiency & Financial Performance	Efficiency Achievements
	Grid Automation Readiness
	System Capacity (Non-Wires)

[1] Exhibit 2B, Section D4
[2] Exhibit 1B, Tab 5, Schedule 1
[3] Exhibit 1B, Tab 3, Schedule 2
[4] Exhibit 1B, Tab 3, Schedule 1
[5] Toronto Metropolitan University, Toronto Second Fastest Growing Metropolitan Area, City of Toronto the Fastest Growing Central City, in the United States/Canada in 2022" (May 23, 2023) https://www.torontomu.ca/centre-urban-research-land-development/blog/blogentry7311/
[6] City of Toronto, Toronto at a Glance https://www.toronto.ca/city-government/data-research-maps/toronto-at-a-glance/
[7] City of Toronto, Hospital – Toronto & GTA & long-term care – rehabilitation facilities https://www.toronto.ca/home/311-toronto-at-your-service/find-service-information/article/?kb=kA06g000001cvj8CAA; City of Toronto, Education https://www.toronto.ca/business-economy/industry-sector-support/education/#:~:text=Toronto%20is%20home%20to%20five,universities%20and%20one%20private%20university
[8] City of Toronto, CanopyTO (revised October, 2021) https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-173552.pdf
[9] Exhibit 2B, Section D2
[10] City of Toronto, Toronto at a Glance https://www.toronto.ca/city-government/data-research-maps/toronto-at-a-glance/
[11] Exhibit 1B, Tab 3, Schedule 2
[12] Exhibit 2B, Section D4
[13] The Government of Canada passed the *Canadian Net-Zero Emissions Accountability Act*, SC 2021, c. 22 establishing a legally binding requirement for the federal government to establish a GHG emissions reduction plan for achieving net zero emissions in Canada by 2050. The Province of Ontario has established a target of reducing GHG by 30% below 2005 levels by 2030: Government of Ontario, Target to reduce GHG emissions to 30% below 2005 levels by 2030.
[14] City of Toronto, TransformTO 2022 Annual Report (April 19, 2023) https://www.toronto.ca/legdocs/mmis/2023/ie/bgrd/backgroundfile-235849.pdf
[15] City of Toronto, Net Zero Existing Buildings Strategy (March 2021) https://www.toronto.ca/wp-content/uploads/2021/10/907c-Net-Zero-Existing-Buildings-Strategy-2021.pdf
[16] City of Toronto, Electric Vehicle (December 9, 2019) Strategy https://www.toronto.ca/wp-content/uploads/2020/02/8c46-City-of-Toronto-Electric-Vehicle-Strategy.pdf
[17] City of Toronto, Toronto Green Standard https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/
[18] City of Toronto, Home Energy Loan Program https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives/home-energy-loan-program-help/
[19] City of Toronto, Energy Retrofit Loans https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives/energy-retrofit-loans/
[20] City of Toronto, The Green Will Initiative https://greenwillto.ca/
[21] City of Toronto, Update on the Net Zero Buildings Strategy and Implementation of Mandatory Emissions Performance Standards (September 6, 2023) https://www.toronto.ca/legdocs/mmis/2023/ie/bgrd/backgroundfile-239097.pdf
[22] Exhibit 2B, Section D4
[23] Exhibit 2B, Section D4
[24] For more information on Toronto Hydro's historic reliability performance, see Exhibit 2B, Section C
[25] Exhibit 2B, Section E2
[26] The City of Toronto is home to approximately three million people within a land mass of 631.1km per Statistics Canada, Canada's Large Urban Centres Continue to Grow and Spread (February 9, 2022) https://www150.statcan.gc.ca/n1/daily-quotidien/220209/dq220209b-eng.htm; Statistics Canada, Defining Canada's Downtown Neighbourhoods: 2016 Boundaries (May 11, 2021)
[27] Statistics Canada, Table 98-10-0002-01 Population and dwelling counts: Canada and census subdivisions (municipalities) https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810000201

[28] Highrise building categorized as a multi-floor building at least 12 stories or 35m in height. As per data from SkyscraperPage, Global Cities & Buildings Database https://skyscraperpage.com/cities/#notes
[29] Exhibit 1B, Tab 3, Schedule 3
[30] Exhibit 1B, Tab 3, Schedule 3
[31] City of Toronto, Toronto's Population Health Profile (February 2023) https://www.toronto.ca/wp-content/uploads/2023/02/940f-Torontos-Population-Health-Profile-2023.pdf
[32] Exhibit 2B, Section D2
[33] Urbanize Toronto, RLB Crane Index Records 238 Cranes in Toronto During Q1 2023 (April 15, 2023) https://toronto.urbanize.city/post/rlb-crane-index-records-238-cranes-toronto-during-q1-2023#:~:text=According%20to%20the%20latest%20report,%2C%20Chicago%20(14)%2C%20Honolulu
[34] Exhibit 2B, Section D4
[35] Exhibit 2B, E5.2
[36] Exhibit 2B, E5.1
[37] Exhibit 2B, D2
[38] Exhibit 2B, Section E5.1
[39] Exhibit 2B, Section A
[40] Exhibit 2B, Section D8; Exhibit 2B, Section E8.4
[41] Exhibit 4, Tab 2, Schedule, 7
[42] Exhibit 4, Tab 2, Schedule 17
[43] Exhibit 4, Tab 2, Schedules 15, 16 and 18
[44] Exhibit 4, Tab 1, Schedule 1
[45] Exhibit 4, Tab 1, Schedule 1
[46] Exhibit 4, Tab 4, Schedule 1
[47] For more information on Toronto Hydro's planning process, see Exhibit 2B, Section E2.
[48] Exhibit 1B, Tab 5, Schedule 1
[49] Exhibit 2B, Section E2
[50] Exhibit 2B, Section D4, Appendix A
[51] Exhibit 1B, Tab 3, Schedule 3
[52] Exhibit 1B, Tab 5, Schedule 1
[53] Exhibit 1B, Tab 5, Schedule 1
[54] Exhibit 8, Tab 1, Schedule 1
[55] Exhibit 2B, Section E2
[56] Exhibit 1B, Tab 3, Schedule 2
[57] Exhibit 4, Tab 4, Schedule 1
[58] Exhibit 2B, Section E6.2
[59] Exhibit 1B, Tab 5, Schedule 1, Appendix A
[60] Exhibit 2B, Section E2
[61] Exhibit 2B, Section E2
[62] Exhibit 2B, Section E2
[63] Exhibit 2B, Section E6.1
[64] Exhibit 2B, Section E6.2
[65] Exhibit 2B, Section E6.3
[66] Exhibit 2B, Section E6.4
[67] Exhibit 2B, Section E6.5
[68] Exhibit 2B, Section E6.6 – includes HONI Switchgear renewal costs of $29M.
[69] Exhibit 2B, Section E6.7
[70] Toronto Hydro's own Future Energy Scenarios forecast a doubling in Toronto's electricity demand by the year 2050 across multiple scenarios (for more information, please refer to Exhibit 2B – Section D4, Appendix A). The IESO's Pathways to Decarbonization report forecasts that demand could more than double by 2050 (https://www.ieso.ca/en/Learn/The-Evolving-Grid/Pathways-to-Decarbonization), while Enbridge's Pathways to Net Zero forecasts an increase in demand of over three times in its electrification scenario (https://www.enbridgegas.com/en/sustainability/pathway-to-net-zero). In the U.S., utilities such as National Grid (https://www.nationalgridus.com/media/pdfs/our-company/massachusetts-grid-modernization/future-grid-full-plan-sept2023.pdf), Eversource (https://www.mass.gov/doc/gmacesmp-

drafteversource/download?_gl=1%2Ako8zfs%2A_ga%2ANzUwNDI5MDE3LjE2NTA5ODEyMjQ.%2A_ga_SW2TVH2WBY%2AMTY5MzkyMDE2OS4zNi4xLjE2OTM5MjM1NzQuMC4wLjA.), and Unitil (https://unitil.com/ma-esmp/en) all published modernization plans forecasting demand increases of over two times by 2050. ISO New England also completed a study which forecasts a doubling in system peak by 2050 (https://www.iso-ne.com/static-assets/documents/100004/a05_2023_10_19_pspc_2050_study_pac.pdf). National Grid ESO (Great Britain's system operator), also forecasts in an increase of about two times across many of its future energy scenarios (https://www.nationalgrideso.com/document/283101/download).

[71] City of Toronto, Net Zero Existing Buildings Strategy (March 2021) https://www.toronto.ca/wp-content/uploads/2021/10/907c-Net-Zero-Existing-Buildings-Strategy-2021.pdf

[72] Exhibit 2B, Section D4
[73] Exhibit 2B, Section D4
[74] Exhibit 2B, Section E5.1
[75] Exhibit 2B, Section E3
[76] Exhibit 2B, Section D4
[77] Exhibit 1B, Tab 4, Schedule 1
[78] Exhibit 2B, Section E5.1
[79] Exhibit 2B, Section E5.2
[80] Exhibit 2B, Section E5.3
[81] Exhibit 2B, Section E5.5
[82] Exhibit 2B, Section E7.2
[83] Exhibit 2B, Section E7.4
[84] Exhibit 2B, Section D5
[85] Exhibit 2B, Section E8.4, Appendix A
[86] Exhibit 2B, Section D5
[87] Exhibit 2B, Section E7.1
[88] Exhibit 2B, Section D5
[89] Exhibit 2B, Section E7.1
[90] Exhibit 2B, Section E7.3
[91] Exhibit 2B, Section E5.4
[92] Exhibit 2B, Section E6.5
[93] Exhibit 2B, Section E6.6
[94] Exhibit 2B, Section E8.4
[95] Exhibit 1B, Tab 4, Schedule 2
[96] Exhibit 2B, Section E8.2
[97] Exhibit 2B, Section E8.3
[98] Exhibit 2B, Section D7
[99] Exhibit 2B, Section E8.4
[100] Exhibit 2B, Section E8.1
[101] Exhibit 2B, Section E8.2
[102] Exhibit 2B, Section E8.3
[103] Exhibit 2B, Section E8.4
[104] Exhibit 4, Tab 4, Schedule 1
[105] Exhibit 4, Tab 4, Schedule 1; Exhibit 4, Tab 4, Schedule 3
[106] Exhibit 4, Tab 2, Schedule 7
[107] Exhibit 4, Tab 2, Schedule 5
[108] Exhibit 4, Tab 2, Schedule 6
[109] Exhibit 4, Tab 2, Schedule 9
[110] Exhibit 4, Tab 2, Schedule 16
[111] Exhibit 4, Tab 2, Schedule 10
[112] See Communications and Public Affairs Segment – Public Legal and Regulatory Affairs program at Exhibit 4, Tab 2, Schedule 18
[113] Exhibit 4, Tab 2, Schedule 13

[114] Exhibit 4, Tab 2, Schedule 18
[115] Exhibit 4, Tab 2, Schedule 9
[116] Exhibit 4, Tab 2, Schedule 9
[117] Exhibit 4, Tab 2, Schedule 19
[118] Exhibit 4, Tab 2, Schedules 1-3
[119] Exhibit 4, Tab 2, Schedule 4
[120] Exhibit 4, Tab 2, Schedule 11
[121] Exhibit 4, Tab 2, Schedule 12
[122] Exhibit 4, Tab 2, Schedule 17
[123] Exhibit 4, Tab 2, Schedule 11
[124] Exhibit 4, Tab 2, Schedule 12
[125] Exhibit 4, Tab 2, Schedule 17
[126] Exhibit 4, Tab 2, Schedule 17
[127] Exhibit 4, Tab 2, Schedule 8
[128] Exhibit 4, Tab 2, Schedule 18
[129] Exhibit 4, Tab 2, Schedule 9
[130] Exhibit 4, Tab 2, Schedule 14
[131] Exhibit 4, Tab 2, Schedule 14
[132] Exhibit 4, Tab 2, Schedule 8
[133] Exhibit 4, Tab 2, Schedule 18
[134] Exhibit 4, Tab 2, Schedule 18
[135] Exhibit 4, Tab 2, Schedule 16
[136] RSO 1990, c. O.1
[137] Exhibit 4, Tab 2, Schedule 15
[138] Exhibit 4, Tab 2, Schedule 14
[139] Exhibit 4, Tab 2, Schedule 15
[140] Exhibit 1B, Tab 3, Schedule 2
[141] Exhibit 1B, Tab 3, Schedule 3
[142] Exhibit 1B, Tab 3, Schedule 2
[143] Exhibit 1B, Tab 3, Schedule 3
[144] Exhibit 1B, Tab 3, Schedule 1
[145] Exhibit 1B, Tab 3, Schedule 1