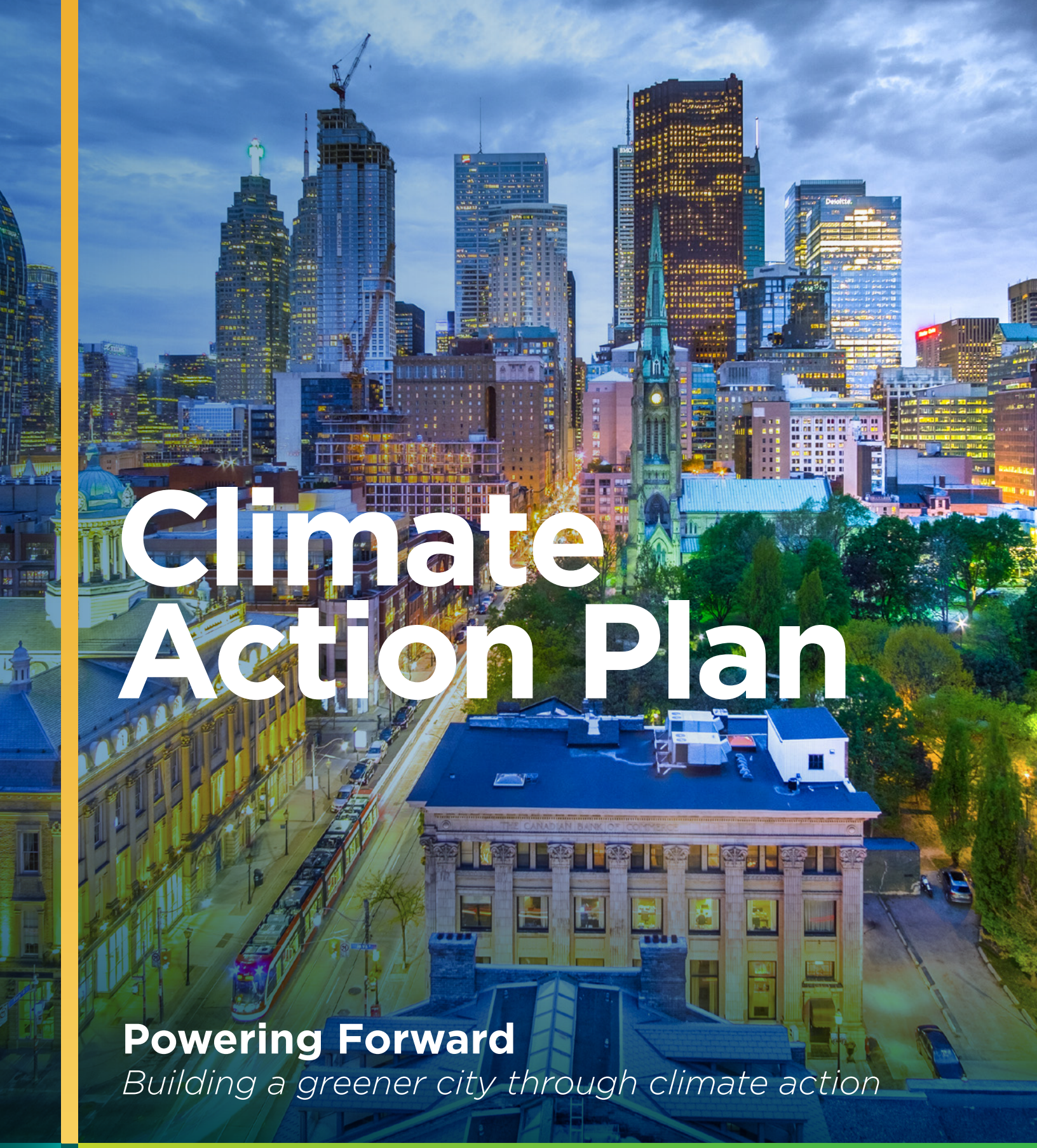

Climate Action Plan

Powering Forward

Building a greener city through climate action

TORONTO HYDRO® Corporation

Executive Summary

Scope

On April 7, 2021, Toronto City Council requested that Toronto Hydro Corporation consider opportunities to respond to the climate emergency through climate action. The City requested that Toronto Hydro prepare a report on what it is currently doing, and an action plan for what more it could do to support the critical objectives of the City's TransformTO vision and forthcoming Net Zero Strategy, including in the following areas: electric vehicle ("EV") charging infrastructure; modernization of outdoor lighting/streetlighting; and renewable energy and energy storage. The City also requested that Toronto Hydro explore non-rate sources of funding, revenue, grants and financing.[1] Through subsequent discussions, the City confirmed that Toronto Hydro should also report on building electrification and energy efficiency.

As requested by City Council, Toronto Hydro is reporting back to the City Manager by the end of the third quarter of 2021.

Commitment to Climate Action

In order to achieve the City's ambitious goals, climate action collaboration must necessarily occur throughout Toronto. Residents and community groups, businesses and industry associations, and different levels of government are among those who have a role to play in the City's Net Zero Strategy. Many of the solutions contemplated and underway in Toronto are designed to electrify transportation, retrofit buildings, decarbonize heavy and light duty industries, and build a more efficient, resilient grid.

Businesses that perform well and succeed in Toronto will have the opportunity to export their innovations globally. With approximately 55% of the world's population living in urban areas today, and with that proportion projected to increase to 68% by 2050, many of the solutions enabled by Toronto climate action could be exported to Canada's established and growing trading partners, and closer to home.

As a clean energy leader in the city and nationally, Toronto Hydro is committed to bold, practical, climate action. In preparing this Climate Action Plan, Toronto Hydro examined the work and plans of other utilities across North America. The City's Net Zero Strategy will be transformational, and requires Toronto Hydro and others in the community to step up with unprecedented proposals to help bring it to fruition.

Toronto Hydro's Climate Action Plan is designed to position Toronto Hydro as a key enabler of the City's vision of the future: to combat climate change, to spur growth

in Toronto's emerging green and cleantech companies, and to contribute to greater social equity within the new economy. This Climate Action Plan identifies three principal opportunities plus additional options, and offers a comprehensive means of delivering nationally significant environmental performance, economic stimulation and social equity advancement. This comprehensive, large-scale, innovative model would set a new standard in climate action through a best-in-class utility response to meet the City's best-in-class Net Zero Strategy.

Powering Forward to Net Zero

As a corporation, Toronto Hydro is deeply committed to environmental sustainability. Its efforts and accomplishments in environmental performance have received recognition from numerous leading authorities, including the ranking of #2 Sustainability Company in Canada by Corporate Knights in 2020. Toronto Hydro has a target of achieving net zero for its own operations by 2040. This builds on Toronto Hydro's previous initiatives, and will focus on reducing emissions from its building and fleet operations, as well as the use of sulfur hexafluoride ("SF_6") as an insulating gas for its electrical equipment. To help track its progress towards net zero, Toronto Hydro will be introducing three new performance metrics on its corporate scorecard relating to environmental performance in 2022: (1) Natural Gas Consumption, (2) Fleet Electrification and (3) Waste Diversion Rate. For more details about Toronto Hydro's corporate environmental performance and plans, please see Part 2.

There are three climate action opportunities that Toronto Hydro can pursue to continue to improve Toronto's environment and help the City achieve its objective of net zero.

Primary Opportunity — Expanded Electricity Distribution

The most significant opportunity for Toronto Hydro to enhance its contributions to climate action is to substantially expand its existing, regulated, electricity distribution business to build a grid that is capable of supporting the realization of the City's Net Zero Strategy. Extrapolating City modelling for a net zero future, Toronto Hydro calculates potential direct investments of up to $10 billion in climate action infrastructure through 2050. Indeed, approximately 75% of the City's Net Zero Strategy depends on these investments by Toronto Hydro.

While this opportunity would require an expansion and an acceleration of grid investment, Toronto Hydro does not require a new mandate from the City to pursue this climate action if these capital needs materialize and are funded in electricity distribution rates. This opportunity for Toronto Hydro to enhance its contributions to climate action also brings the potential for a win-win-win scenario for the utility's customers, shareholder and other stakeholders. Along with ensuring that the grid provides the backbone for ambitious climate action leadership in Canada's largest city, these investments would increase the capacity and resilience of the grid to

serve a growing and changing city, as well as support financial stability and growth of the distribution business where electricity continues to be grid-supplied.

Toronto Hydro notes that expanding the grid to enable net zero will present challenges not only for the utility, but for its stakeholders. One challenge is significant increases to distribution rates paid for by customers — assets must be built before increased load materializes, driving higher rates in the earlier years. This will require government and regulator supported solutions to ensure electricity is affordable for customers. Also potentially helping to mitigate increasing costs of electricity bills over time will be declining customer bills for gasoline, natural gas and other carbon-based fuels.. Another challenge is a requirement for additional equity to maintain Toronto Hydro's strong balance sheet and meet expectations of the financial market and regulators. Toronto Hydro is committed to working with stakeholders to address and, where possible, mitigate challenges such as these, recognizing the imperative of responsibly addressing the climate emergency.

For further details about this opportunity, including attributes, costs, benefits and implementation plans, please see Part 3A of this report.

Incremental Opportunity — Climate Advisory Services

A second opportunity for Toronto Hydro to enhance its contributions to climate action is to create a new, unregulated, *Climate Advisory Services* business to support the realization of the City's Net Zero Strategy by facilitating and stimulating the growth of emerging local cleantech markets. Toronto Hydro would work closely with its customers, cleantech companies in Toronto's growing, local climate action sector, funders such as Natural Resources Canada ("NRCan") and other stakeholders to help remove barriers and enable delivery of projects in Toronto that electrify transportation, electrify and enhance the energy efficiency of buildings, and build renewable generators and energy storage systems. Toronto Hydro requires a new mandate from City Council to implement this new line of unregulated climate action business.

Toronto Hydro estimates that the cost of this option would be up to $400 million through 2050. To finance this, Toronto Hydro has identified that it can stretch its existing financial resources to allocate up to $15 million per year to self-fund this initiative. In addition to Toronto Hydro's self-funding, cleantech and customer projects will be enabled through subsidies from federal and provincial governments, investment by cleantech and contributions by climate-conscious customers. Over the period leading up to 2050, Toronto Hydro expects its proposal will facilitate up to $3.5 billion in unregulated climate action.

TH-Supported Climate Programs	Cost ($M)	Program Size	Impact
Transportation Electrification	600	50,000 chargers	Serving 1 million+ EVs
Buildings Electrification	600	60,000 heat air pumps	15% of all buildings
Renewables + Storage	2,300	300 MW of local generation	300,000 projects
TOTAL	**3,500**		

Toronto Hydro's contribution to climate action through *Climate Advisory Services* would be up to $400 million, with the others noted above making corresponding project investments of up to $3.5 billion. Any municipal grants or incentives could increase either of these amounts, and the corresponding climate action.

For further details about this opportunity, including attributes, costs, benefits and implementation plans, please see Part 3B of this report.

Further Incremental Opportunity — Climate Capital Investments

The third opportunity for Toronto Hydro to enhance its contributions to climate action is to pursue modernization of outdoor lighting within its existing unregulated streetlighting company and/or create a new, unregulated business which would make unregulated capital investments directly in the other areas of climate action identified by the City: transportation electrification, building electrification and energy efficiency, and renewable generation and energy storage systems.

The modernization of outdoor lighting opportunity would involve Toronto Hydro implementing a city-wide LED conversion project, which could be undertaken within Toronto Hydro's existing unregulated business. In addition to the financial benefits resulting from lower energy costs and longer life of light bulbs, LED conversions across Ontario and North America have produced community benefits of lighting quality improvements and greenhouse gas ("GHG") reductions. Toronto Hydro requires a new mandate from City Council to implement this. The costs of this opportunity would be approximately $180 million in total, and, while it could be completed in as little as four years, there are a range of options for pacing the project. To finance this, the City may be eligible for certain federal, climate-oriented, low-interest loans, and may achieve a positive payback through financial savings in energy costs and reduced maintenance costs.

TH-Implemented Climate Program	Cost ($M)	Program Size	Impact
Outdoor Lighting	180	175,000 streetlights	60% reduced energy use

Climate Capital Investments in the other areas the City requested Toronto Hydro to consider — transportation electrification, building electrification and energy efficiency, and renewable generators and energy storage systems — are potential

case-by-case complements to the *Climate Advisory Services* opportunities in those areas discussed above. Toronto Hydro requires a new mandate from City Council to implement this new line of unregulated climate action business.

Should the City direct Toronto Hydro to pursue this option for anything other than streetlighting, Toronto Hydro would be required to create a new, unregulated corporation to undertake these *Climate Capital Investment* projects: (a) that the *Expanded Electricity Distributor* cannot do for regulatory, financial or other reasons; and (b) for which there is no cleantech market interest or there are insufficient federal or provincial government subsidies available to make the project economically feasible. To enable Toronto Hydro to undertake such a role in projects with economic challenges, the financial support of the City would be required to the extent the project customers (e.g. building owners) or users (e.g. EV owners) do not pay all project-related costs. Toronto Hydro recommends that a minimum investment value threshold on a per-project or overall program basis be implemented so that this model operates in an economically efficient manner and to lessen incremental administrative costs. This would allow Toronto Hydro to minimize costs compared to the size of the investment, allocate appropriate resources upfront in deploying identified projects, focus on projects with significant emissions-reduction potential, and achieve commercial viability with such projects.

For further details about this opportunity, including attributes, costs, benefits and implementation plans, please see Part 3C of this report.

Toronto Hydro Climate Action Opportunities Summary

	Expanded Electricity Distributor	Climate Advisory Services	Climate Capital Investments	
City-Specified Climate Actions Addressed	All	Transportation electrification, building electrification and energy efficiency, and renewable energy and energy storage	Modernization of outdoor lighting	Transportation electrification, building electrification and energy efficiency, and renewable energy and energy storage
Toronto Hydro Activity	Build, own and operate the grid to provide the backbone needed to enable the City's Net Zero Strategy	Facilitate and stimulate growth of emerging cleantech markets to help enable the City's Net Zero Strategy	Convert Toronto Hydro streetlights to LEDs to drive energy efficiency to help enable the City's Net Zero Strategy	Pursue case-by-case projects to help enable the City's Net Zero Strategy where there's no cleantech market interest or there are insufficient federal or provincial government subsidies available to make the project economically feasible
Business Structure	Regulated electricity distribution utility	New unregulated business arm within regulated utility	Existing unregulated streetlighting company (outside of regulated utility)	New unregulated company (outside of regulated utility)
Climate Action Expressed as $ (up to 2050)[2]	Up to $10B	Up to $3.5B (facilitated), including customer contributions and grants/incentives	Approximately $180M	TBD[3]
Costs (up to 2050)	Up to $10B (aligned with scale)	Up to $400M (up to $15M/year)	Approximately $180M	TBD
Funding/ Financing	Rates-funded grid investment; Toronto Hydro debt; and City equity	Toronto Hydro self-funding for its own costs; customer revenues and government grants/incentives for remainder	City equity (opportunities for federal loans)	Government grants/ incentives; City equity

Immediate Next Steps

The climate emergency demands significant climate action, and Toronto Hydro is proud to offer this Climate Action Plan. Toronto Hydro respectfully requests: (a) support for Toronto Hydro's *Expanded Electricity Distribution* climate action within the company's existing mandate; (b) a new mandate for a *Climate Advisory Services* business; and (c) a new mandate to partner with the City to convert all streetlights to LEDs within Toronto Hydro's existing *Streetlighting Business*.

With the requested support and mandates, Toronto Hydro looks forward to taking its next steps to help build a greener city through climate action. In 2022, it will begin to organize its businesses to reflect the approved Climate Action Plan, including engaging further with potential municipal and commercial business partners and customers. It will re-engage the federal and provincial governments to build on initial funding and subsidy discussions, and will begin facilitating projects that help Toronto achieve its Net Zero Strategy.

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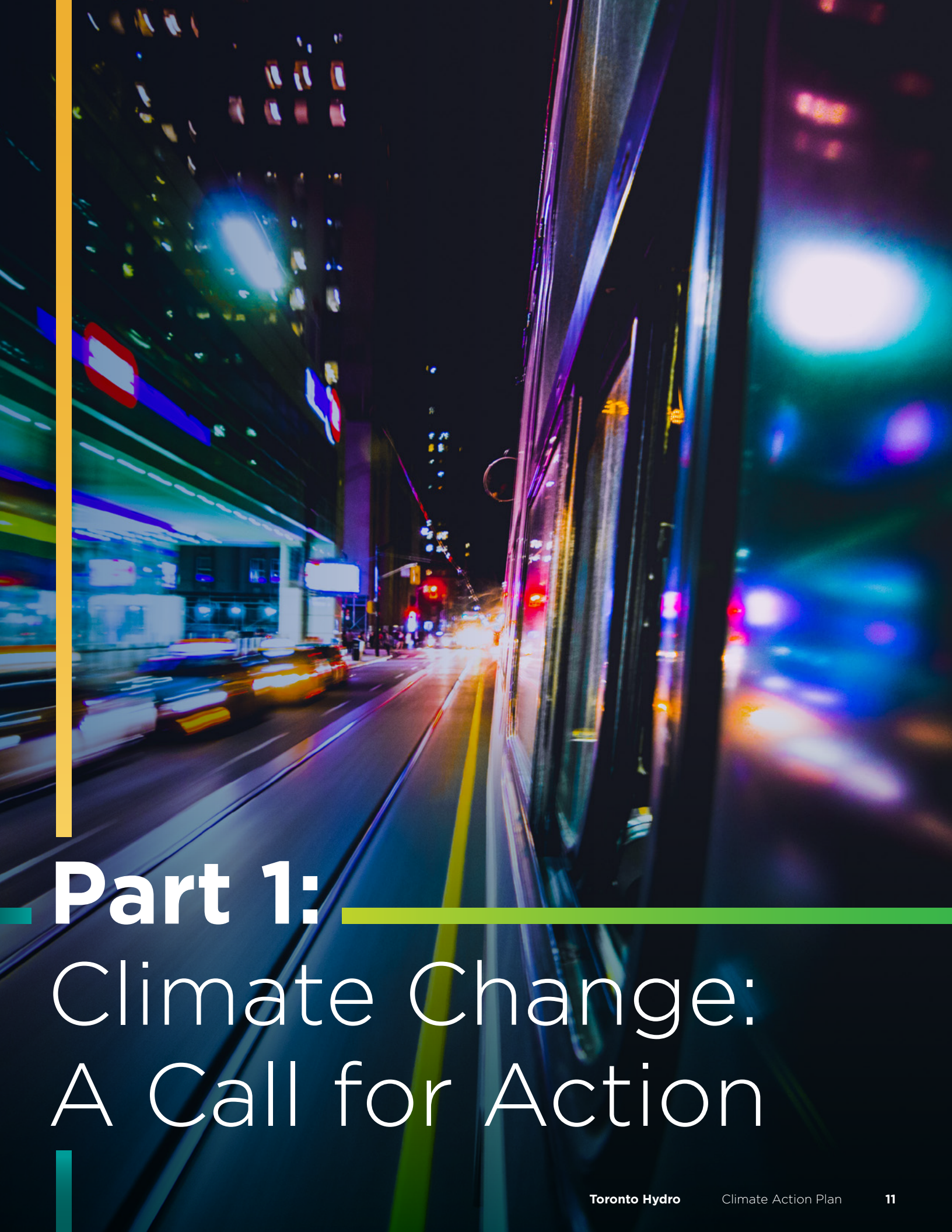


Part 1:
Climate Change: A Call for Action

Science and Policy

"Climate change is real. It is caused by greenhouse gas emissions resulting from human activities, and it poses a grave threat to humanity's future. The only way to address the threat of climate change is to reduce greenhouse gas emissions."[4]
— Supreme Court of Canada

The acute nature of the climate emergency was readily apparent in 2021. Wildfires that ravaged the Canadian and American west, hurricanes that devastated coastal communities from the Gulf of Mexico to Manhattan to the coast of Newfoundland, and extreme rainfalls in some regions contrasted starkly with extreme droughts in others. In September 2021, the Intergovernmental Panel on Climate Change issued the first installment of its Sixth Assessment Report ("AR6").[5] AR6 lays bare the science behind the climate emergency, and foretells the fundamentally different world that lies ahead, absent transformative climate action. In short, the extraordinary destruction and human suffering in 2021 will not only persist — becoming an ordinary occurrence — but will further intensify and expand to affect cities like Toronto that have to date been spared the brutality experienced by others. Life in that desperate future is unfathomable; the cost of inaction is immense.[6]

Insured losses for catastrophic weather events totaled over $18 billion between 2010 and 2019, and the number of catastrophic events was over three times higher than in the 1980s.[7]

The challenges that the climate emergency and the costs of climate action pose to individuals, families, businesses and other organizations, especially the most vulnerable among them, cannot be dismissed or ignored. The worst effects of climate change need to be mitigated, and so too do the challenges of the journey to a net zero future. It is with this in mind that governments around the world,[8] as well as community advocacy organizations,[9] climate experts,[10] industry associations[11] and others, are taking the position that, as societies recover and rebuild in the aftermath of the COVID-19 pandemic and resulting personal and economic crises, now is the time to "build back better."

The governments of the largest global economies committed on average 4% of GDP (in some cases more than 30%) in direct stimulus and additional financial support to overcome challenges associated with the COVID-19 pandemic.[12] This massive mobilization of stimulus funds, including the $53.6 billion the Government of Canada has committed since October 2020 to support a "green recovery," is driving an economic recovery that pursues social and environmental outcomes alongside economic ones.[13]

Challenges/ Opportunities for Growth

The path to net zero is challenging. In July 2021, the International Energy Agency ("IEA") issued its report, "Net Zero by 2050: A Roadmap for the Global Energy Sector."[14] The IEA anticipates that the necessary electricity generation and infrastructure (e.g. transmission, distribution) investments alone will rise from an annual average of approximately $1 trillion (USD) to nearly $3 trillion (USD) in the 2030s.[15] The IEA further expects that investments in energy-dependent end-use products (e.g. household appliances, industrial equipment) will grow from an annual average of approximately $0.75 trillion (USD) to approximately $2.3 trillion (USD) in the 2040s, with nearly $1.5 trillion of that latter sum spent on electrification and energy efficiency.

A closer-to-home illustration of the cost of action was provided in June 2021 in the City's Net Zero Existing Buildings Strategy. Specifically, average annual investment in retrofits needs to nearly double from $5.4 billion to $10 billion, for a total incremental climate action cost of $140 billion over a 30-year period for existing building stock.[16] Another local illustration of the cost of action is in the City's EV Strategy that was finalized in December 2019.[17] Based on the report's estimate of the costs of buying and installing EV chargers,[18] its goal of serving 20% of all registered personal vehicles[19] and the number of direct current fast chargers and Level 2 chargers required in public locations to meet that need, the cost of that climate action out to 2030 ranges from $82 million to $230 million. Figures are not yet available for the anticipated public EV charging costs from 2031 to 2050, nor for the private EV charging costs that many EV users incur.

Many businesses will also struggle to balance the incremental costs of climate action. This challenge is all the more acute as a result of the COVID-19 pandemic. As of December 2020, economic output in Canada was still down 3.3% from pre-COVID levels, following a year in which approximately 100,000 businesses closed despite an average of $83,000 in government emergency support programs such as the Canada Recovery Hiring Program and the Canada Emergency Wage Subsidy.[20]

Energy systems around the world must be made cleaner and expand to the demand profiles of an electric, net zero future. To stave off a harsher (and more expensive) fate in Toronto, homeowners and businesses will need to further electrify their homes and vehicles, and pursue further conservation and energy efficiency.

However, climate action can help in this way, too. Retrofitting shops, office towers, warehouses and factories, plus moving to low or zero emission fleets, and also investing in renewable generation and energy storage as part of transitioning to a net zero future, can all lower the operating costs for these businesses. With specialized attention to their particular circumstances and the opportunities for climate action projects and subsidies, businesses can be helped through the recovery and rebuild. Environmental and economic sustainability can both be achieved through climate action.

As highlighted in the Toronto Office of Recovery and Rebuild (TORR) Report, "Toronto's economy entered the COVID-19 crisis on a strong foundation that will likely improve the city's ability to recover from the effects of the pandemic."[21]

Social Equity

Climate change impacts some people much more dramatically than others. As the United Nations Human Rights Office of the High Commissioner noted, "climate change is a human rights problem and the human rights framework must be part of the solution."[22] Indeed, the City's Climate Resilience Framework and Recommendations Report from March 2019 extensively chronicles the much greater risk that climate change poses to already vulnerable populations.[23]

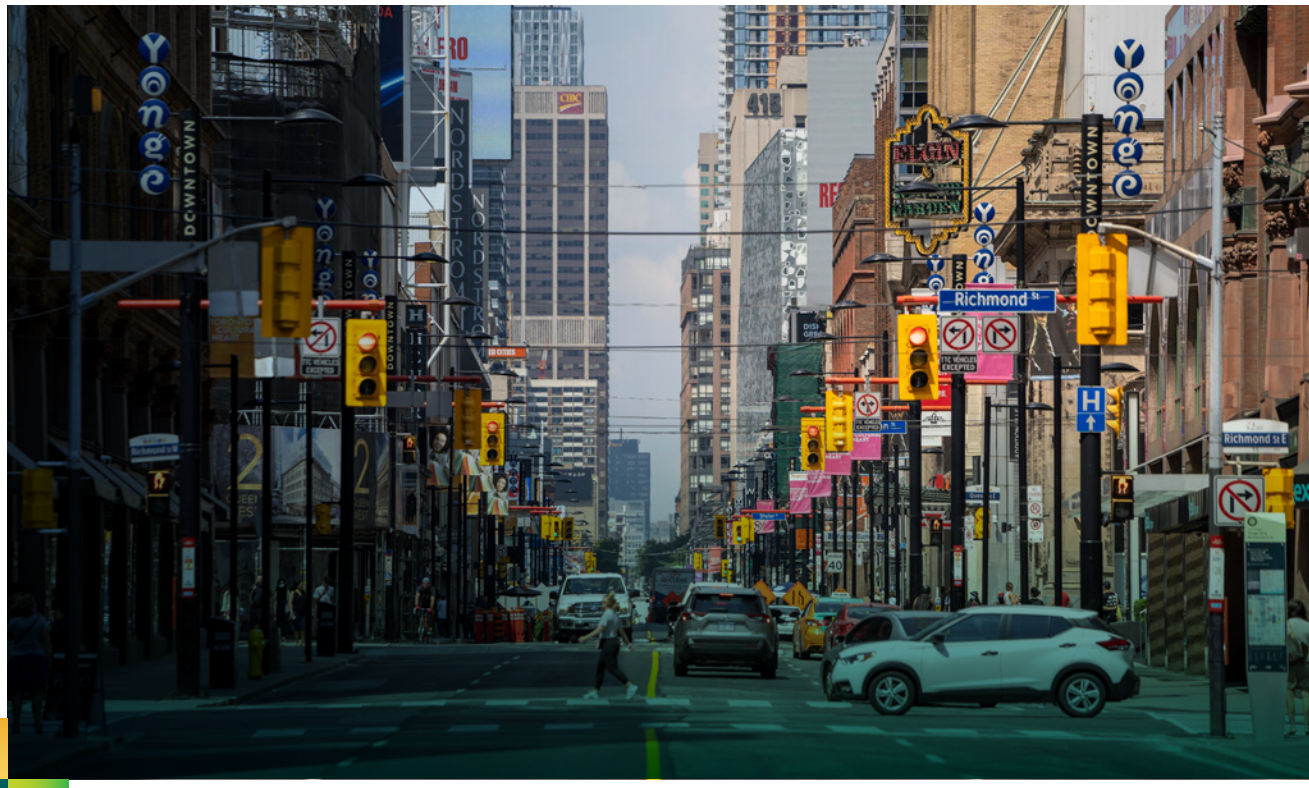
> *"The negative impacts of climate change are disproportionately borne by persons and communities already in disadvantageous situations owing to geography, poverty, gender, age, disability, cultural or ethnic background, among others, that have historically contributed the least to greenhouse gas emissions."*[24] — The United Nations Human Rights Office of the High Commissioner.

Climate change drives more extreme weather, rising temperatures and exposure to pollution, all of which can amplify an individual's vulnerability to climate change based on their predisposed social determinants of health. This is, tragically, evidenced in the devastating impacts of Hurricane Ida that ravaged the city of New Orleans and parts of Louisiana.[25]

From United Nations reports to recent experience, it is clear from these events how climate change disproportionately impacts vulnerable segments of society, and the inherent value of climate action in achieving social equity. This includes putting to use subsidies and other supports to help those who need it most[26] — to facilitate action by end users in all communities and guard against the incremental socialized costs of climate action (e.g. infrastructure).

Climate change is regressive, and disproportionately impacts vulnerable communities. Integrating supports into climate action can help preserve and improve social equity:

- Consulting with equity-seeking and low-income communities and their service providers on the development of plans and projects
- Investing in targeted areas to foster and build resiliency, access to services and opportunities for equity-seeking communities
- Developing targeted education to equity-seeking and low-income communities so that they are aware of green programs and their potential benefits
- Using public space or other relevant locations to ensure there is an equitable distribution of services and benefits



City Strategies

Climate action at the local level is crucial, as municipalities play a key role in the implementation of climate solutions. Cities around the world are among the most active and important climate strategists, policymakers and overall enablers of transformational action.[27, 28]

Cities are complex networks of people, businesses and the systems that support them. Municipal infrastructure is exposed to the elements, above ground and below it. The built environment provides hubs for public life and private endeavors that fuel communities and economic well-being. Natural systems provide protection from the elements, with permeable surfaces guarding against river floods, and tree canopies offering protection and cooling from summer sun. They are all interwoven to create a complex fabric that makes cities some of the most vibrant and dynamic places on earth for people to live, work and play.

The threat of climate change puts urban life at risk. As outlined in the AR6 Report: "Cities intensify human-induced warming locally, and further urbanization together with more frequent hot extremes will increase the severity of heatwaves." It goes on to caution that, "[i]n coastal cities, the combination of more frequent extreme sea level events (due to sea level rise and storm surge) and extreme rainfall/river flow events will make flooding more probable."[29] As such, in Canada and abroad, cities are taking aggressive stands to combat climate change and mitigate the threat it poses.

The C40 Cities Network connects 97 of the world's megacities, including Toronto, representing 700+ million citizens to take bold climate action by using a science-based approach and exchange of best practices to take urgent and effective action against the climate crisis.

In 2019, Toronto City Council declared a climate emergency "for the purpose of naming, framing, and deepening our commitment to protecting our economy, our ecosystems and our community from climate change." The declaration was part of a coordinated effort by the C40 Cities Network to recognize the global climate emergency and to achieve the 1.5°C Scenario of the 2015 Paris Agreement through emissions reduction.[30, 31, 32]

From London, Los Angeles and Rio de Janeiro to over 500 Canadian municipalities, cities around the world are declaring climate emergencies.

In pursuit of the emissions target, cities are pursuing climate actions in areas like electrified transportation, energy efficiency (particularly in buildings) and renewable energy systems. Toronto's TransformTO framework reflects these key areas, as did the City Manager's report to City Council that led to this Climate Action Plan.[33]

Shifting conventionally fueled modes of transportation to active and electrified transit are common focal points. TransformTO envisions 100% of transportation options using low or zero carbon energy sources by 2050. Vancouver wants 50% of the kilometres driven on Vancouver's roads to be by zero emissions vehicles by 2030.[34] Montreal plans to spend $885 million over three years on a transportation electrification strategy.[35]

Action to make new and existing buildings more resilient and to reduce their climate footprint is apparent virtually everywhere. Toronto City Council recently approved changes to the Toronto Green Standard[36] to increase EV requirements and adopted an Existing Buildings Net Zero Strategy[37] that encompasses a host of actions in pursuit of TransformTO's buildings objectives. London, England, seeks to double the share of buildings that reach the Energy Performance Certificate energy efficiency standard of at least C[38] by 2030 and for all new buildings to be zero carbon.[39] The City of Vancouver offers $2,000 or $6,000 top-ups to CleanBC's Better Homes and Home Renovation Rebate Program participants that switch from a fossil fuel heating system to an electric air source heat pump.[40] Halifax is planning for net zero new construction by 2030 and retrofits for all existing buildings by 2040.[41] Financing programs to help defer the cost of going green, similar in purpose to the City of Toronto's Home Energy Loan Program, are also frequently used.

Decarbonizing energy systems with emissions-free, renewable energy and storage technologies is another frequent target. Toronto Hydro has enabled approximately 2,070 renewable generation interconnections totalling approximately 200 MW between 2009 and 2019, representing 38% of the City's 2020 renewable energy generation goal and approximately 127% of the City's 2020 goal for solar photovoltaic ("PV") generation.[42, 43] The City of Austin adopted a target of 75% carbon-free energy by 2025 and is divesting its interest in coal generation facilities.[44] Los Angeles City Council recently adopted a target of 100% renewable energy by 2035.[45] New York City targets a zero-emissions electricity grid by 2040.[46]

Finally, municipal lighting improvements — and the use of LED technology more specifically — is becoming common practice because their improved efficiency addresses fiscal and environmental imperatives. Many municipalities in Ontario already use, or are in the process of moving to, LEDs as a standard for streetlighting.[47]

While the targeted areas for climate action are consistent, municipalities employ a rich and diverse array of strategies tailored to their own circumstances. Climate action, informed by best practices, regularly accounts for local needs and preferences. For example, Reykjavik leverages its immense local resource of geothermal energy to heat all of its homes.[48] In San Diego, optional time-of-use electricity rates are promoted for EV owners charging at home.[49] Flood prevention is a central theme in the climate action plan of New Orleans.[50] And the climate and energy strategy of the northern city of Oslo makes virtually no mention of solar PV investment, limited to a smart pilot that discharges surplus power to the Norwegian grid that is almost exclusively supplied by hydroelectric generation.[51, 52]

The role of utilities within municipal climate action is similarly diverse and often indirect. Most major North American cities are served by utilities regulated by other levels of government, and utility action is shaped by their policies. In California, for example, state regulators have permitted public utilities to spend more than $1 billion (USD) in ratepayer funds to invest in EV charging infrastructure.[53] Whereas in Ontario, EV charging services including charging stations are considered competitive products and therefore do not fall under Ontario Energy Board ("OEB") regulation.[54]

It is also rare for electric utility service territories in North America to overlap perfectly with the municipal boundaries of large cities.[55] It is even less common for a large city to be a majority or full owner of an electric distribution utility with which it serves a shared boundary.

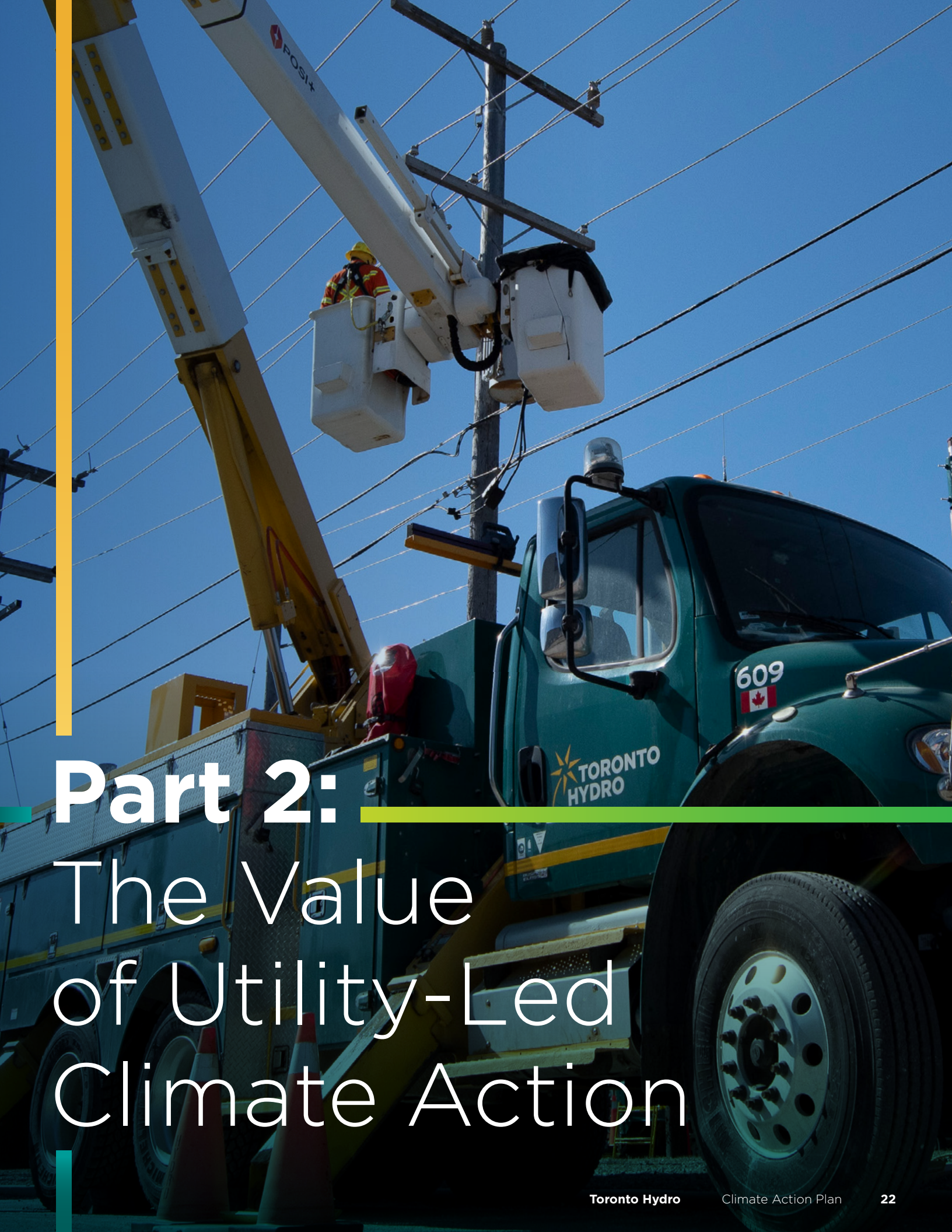
San Francisco receives no more tailored climate action from Pacific Gas and Electric, the investor-owned electricity provider, than other municipalities it serves in central and northern California with less ambition to tackle climate change.[56, 57]

As a result, there is no uniform climate strategy for cities nor is there a standard model for distribution utility climate action. Enabling climate action requires solutions that work for the particular city, for the particular climate and for the particular population. The approaches taken by the City of Toronto and Toronto Hydro must necessarily reflect the unique characteristics of the community they serve in identifying the optimal opportunities to tackle the climate emergency on the pathway to net zero.

A Call for Collaborative Action

Given the characteristics of Toronto, climate action here should not only respond to the climate emergency in pursuit of environmental objectives, it should also enable a more robust local economy that benefits workers and businesses, and advances social equity. Toronto Hydro's Climate Action Plan proposes to do that. Three opportunities to do so are through an expanded electricity distribution business that meets the growing electrification needs of customers and local generators alike, through a climate action-oriented advisory services business that builds upon Toronto Hydro's energy expertise and expansive relationships with customers and cleantech, and through direct investment in capital projects like streetlighting.

Toronto Hydro is a "network company" — its business is inherently one of interconnections. Climate action demands a "network mindset" — its challenging imperative can only be achieved through collaboration between customers, companies and governments.[58] This Climate Action Plan, if approved by City Council, will enhance Toronto's collective capacity to achieve net zero.



Part 2: The Value of Utility-Led Climate Action

Electricity's Green Advantage

In 2019, Alberta, Ontario, Quebec, Saskatchewan and British Columbia together released 91% of Canada's total national GHG emissions.[59] Of these top five emitters, only Ontario and Quebec lowered their GHG emissions from 1990 levels, by 9% (16.8 Mt CO_2e) and 3% (2.7 Mt CO_2e) respectively.[60] The Ontario Energy Association found that Ontario's GHG reductions are largely attributable to its cleaner electricity sector. Since 2005, proactive policy measures like phasing out its coal-fired generation plants and aggressive conservation and demand management ("CDM") programming resulted in significant progress. While annual electricity demand declined by 10% over the past 15 years, reduced emission intensity of Ontario's generation fleet compounded the emissions reductions achieved. The net result is that Ontario's electricity emissions are down by 90% from 2005 levels.[61] Today, Ontario's electricity sector accounts for only 2% of the province's economy-wide GHG emissions as opposed to 82% from the transportation, industry and buildings sectors.[62]

Significant emission reductions can be found by leveraging electricity as a source of energy in place of more emissions-intensive fuel sources.[63] Ontario's electricity grid is considerably cleaner than other parts of the economy, making it comparatively advantageous for fuel switching. It is 94%[64] emissions-free; available on a scale well beyond the potential of renewable natural gas or other fossil fuel alternatives;[65] and there is considerable existing infrastructure that is safe and regulated.

Currently, 48% of Ontario's energy use comes from refined petroleum products primarily for transportation; 28% from natural gas to heat homes, businesses and industry; 16% from electricity; 4% from biofuels; and the remaining 4% from other fossil fuels.[66]

A strategy of decarbonization and electrification forms a strong backbone from which to mobilize climate action. This presents a tremendous opportunity for the City of Toronto and Toronto Hydro.

Toronto Hydro's Environmental Performance

Toronto Hydro is well-positioned to drive climate action. Environmental performance is a core value at Toronto Hydro and is embedded in the governance of the utility.[67] Toronto Hydro actively contributes to the City's climate change goals, maintains a demonstrably strong record on environmental performance formalized through its annual Environmental Performance Report, and is recognized as a top environmental performer, partner and leader.[68]

As part of Toronto Hydro's environmental commitment, it is integrating environmental sustainability into the utility's operations — reducing its environmental footprint. Between 2016 and 2020, the utility decreased its GHG emissions from its facilities, SF_6-containing equipment and fleet by 42%, 36% and 31% respectively.[69] Since 2019, Toronto Hydro reduced the size of its fleet by 13%.[70, 71] Not only did these efficiencies achieve environmental gains, they contributed to the 17.4% distribution rate reduction for customers in 2020.

As part of its vision for accelerating a sustainable and low-carbon future for Toronto, Toronto Hydro is committed to implementing an ambitious program to achieve net zero GHG emissions by 2040. This program will build on Toronto Hydro's previous initiatives and will focus on reducing emissions from its building and fleet operations, as well as the use of SF_6 as an insulating gas for its electrical equipment.

To help achieve net zero emissions by 2040, Toronto Hydro is committed to meeting accelerating targets for building and fleet electrification and transitioning towards 100% electrification of its fleet vehicles and operations centres. In addition, to help track its progress towards net zero, Toronto Hydro will be introducing three new corporate metrics relating to environmental performance starting in 2022: (1) Natural Gas Consumption, (2) Fleet Electrification and (3) Waste Diversion Rate.

As a result, it has been recognized for its environmental leadership. In 2020, Corporate Knights ranked Toronto Hydro second among all evaluated companies for sustainability and first amongst electric utilities.[72] The Canadian Electricity Association awarded the utility a Sustainable Electricity Company designation.[73] Two

of Toronto Hydro's work centres are certified as meeting the Building Owners and Managers Association of Canada requirements for building environmental standards (i.e. "BOMA Best").[74] Toronto Hydro's CEO was recognized for his leadership, receiving the Responsible CEO of the Year Award from Corporate Responsibility Magazine (2017) and the Individual Leadership on Sustainability Award from the Canadian Electricity Association (2017). Both awards were accepted on behalf of the efforts of the entire Toronto Hydro team.

Toronto Hydro's Contributions to Toronto's Climate Goals

Toronto Hydro makes many critical contributions to the City's climate goals. The utility invests billions of dollars into its electricity grid to ensure the modern and efficient delivery of clean power to nearly 800,000[75] residential, commercial, industrial and institutional customers across a city of nearly 3 million people.[76]

Toronto Hydro has played a vital role in the provincial energy transformation: from leading over a decade of CDM programming and connecting thousands of renewable projects, to partnering with the City on TransformTO-supporting projects and decarbonizing the utility's own operations, Toronto Hydro is a recognized leader. EV chargers were deployed to make it easier for car owners to transition away from gasoline automobiles.[77] Innovative programs developed and delivered by the utility enhanced its customers' energy efficiency so that more electricity is available as an alternative to carbon-based energy sources. Solar PV generation and energy storage was built to displace small-scale diesel and natural gas generation in the city, including at City-owned facilities.[78] Toronto Hydro has been, and continues to be, a leading provider of environmentally sustainable solutions.

Connecting Renewable Generation to the Grid

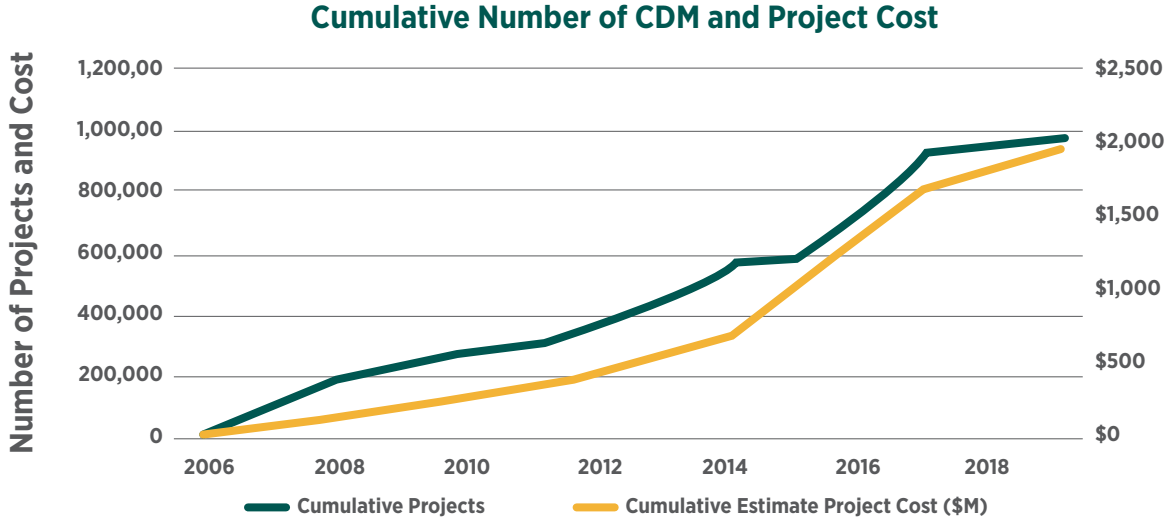
Between 2015 and 2019, Toronto Hydro invested over $13 million in monitoring and control equipment to safely and reliably connect distributed generation projects to the distribution system, including solar PV and bio-gas.[79] These investments, and others like them, facilitated an increase in the number of renewable energy projects in the city by a factor of ten: from 216 in 2010 to 2,070 in 2019.[80]

Toronto Hydro developed a joint-venture project with the City to install dozens of solar generation projects. Twenty projects completed between 2012 and 2016 generated 3.1 million kWh of performance in 2019, and an additional 52 projects were completed by the end of 2018.[81]

Driving Energy Efficiency, Conservation, and Demand Management

For more than a decade, Toronto Hydro influenced provincial policy frameworks and program design, and secured hundreds of millions of dollars in CDM funding for programs and partnerships in Toronto. Between 2006 and 2019, the utility designed and administered CDM programs that were tremendously popular with customers.[82] Energy efficiency projects including adaptative thermostats, rebalanced building hydronic systems, lighting retrofits and swimming pool upgrades are just a few of the utility's programs that allowed customers to manage and reduce their energy consumption. From 2006 to 2015, conservation efforts produced 1.7 TWh in total energy savings, equivalent to taking 600 large condo towers off the grid: an average of more than one per week, every week, for 10 years.[83] This was among the most significant CDM achievements of any utility in Ontario. As a result, the Ontario Government and its agencies allocated Toronto Hydro the largest investment for CDM programming, and assigned it the largest climate action targets out of all of Ontario's electric and natural gas utilities. The province also appointed Toronto Hydro to the provincial governance body leading and overseeing CDM across Ontario from 2015 to 2019. The provincial funding, targets and appointment recognized Toronto Hydro's exceptional performance in the CDM space, and its capacity and capability to produce results.

Over the entire 14-year period from 2006 to 2019 during which it provided CDM programs, Toronto Hydro helped deliver nearly one million residential and commercial CDM projects in Toronto worth a total value of approximately $1.9 billion, that led to approximately 3.6 TWh in energy savings and generated approximately 1.4 Mt CO_2e in GHG reductions.[84]



Partnerships with the City to Support Environmental Objectives

Toronto Hydro frequently partners with the City and its agencies and commissions on innovative energy projects. The utility constructed and presently operates on-street EV charging pilots downtown and in residential areas traditionally underserved by conventional EV charging facilities, and partnered with the Toronto Parking Authority on EV charging stations at their parking facilities.[85]

Toronto Hydro launched on-street EV charging pilots — with 17 chargers located across the city in operation for a 12-month pilot. The pilot will provide valuable information to Toronto Hydro about charging patterns, and adds to the fabric of nearly 1,000 other publicly accessible charging stations across the city that Toronto Hydro has connected to the distribution system, and the nearly 2,000 at the homes of EV users, which are also powered by Toronto Hydro.[86]

Recently, Toronto Hydro provided project management support to bring solar-battery projects to the City's EMS-46 station to improve the facility's resiliency, and the Waterfront Neighbourhood Centre to eliminate the need for fossil fuel back-up generators.[87] Toronto Hydro staff have also worked closely with City of Toronto staff on a number of policy initiatives, including the City's EV Strategy, the design and development of elements of the Toronto Green Standard, and in an advisory capacity on the Existing Building Advisory Committee and District 2030.

Toronto Hydro partnered with the province to build an innovative battery energy storage system to provide clean back-up power to the Eglinton Crosstown light rail transit ("LRT") line. This solution will increase reliability, lower operating costs and avoid emissions.[88]

Through the services it delivers, the way in which it operates, policy advocacy and partnerships with the City, Toronto Hydro is a top environmental performer.

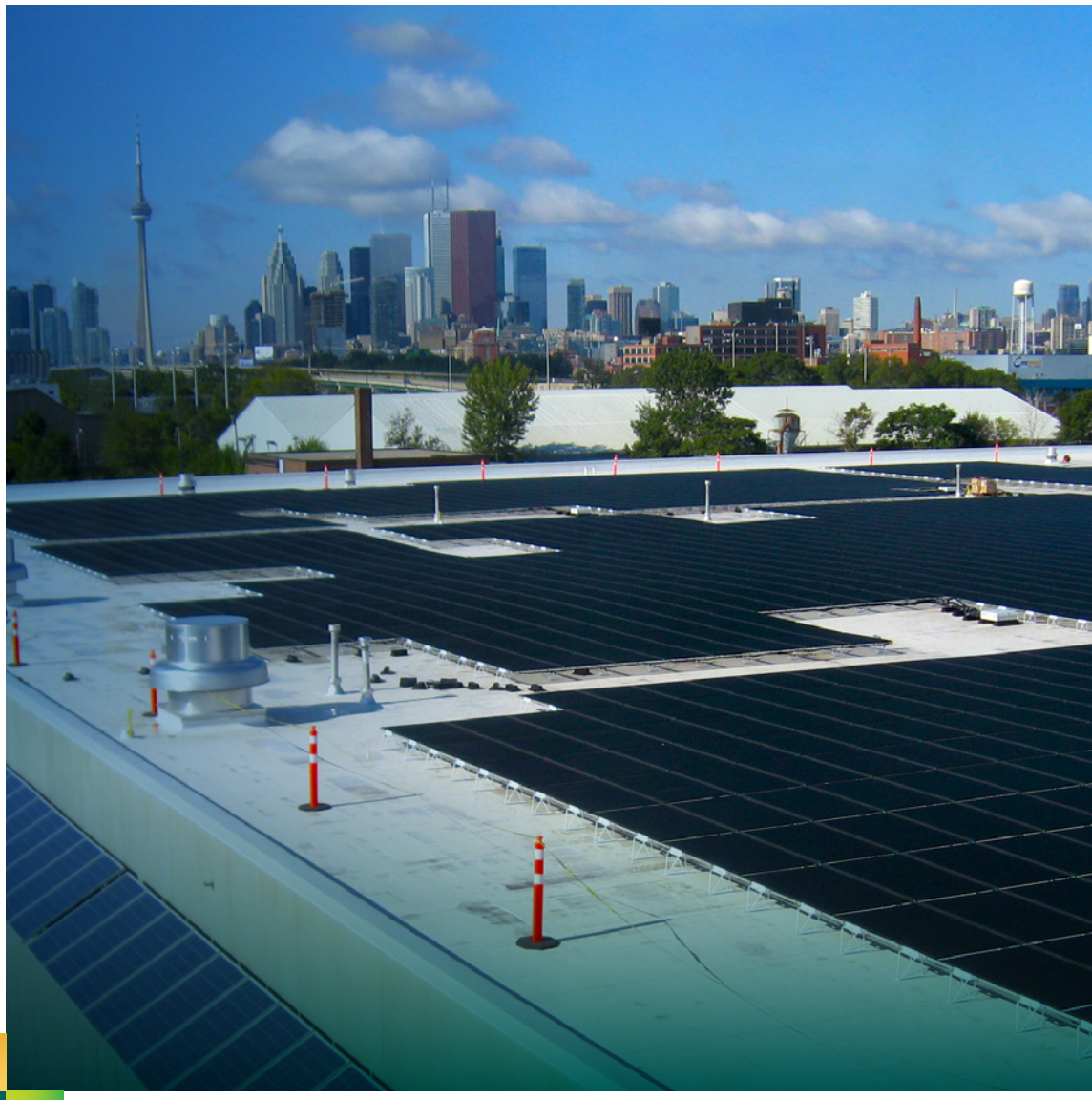
Toronto Hydro's Continued Commitment to Environmental Performance

Building on its successes, Toronto Hydro has continued to add to its strong environmental record. Toronto Hydro's 2020 to 2024 OEB-approved utility business plan[89] is designed to produce outcomes aligned with customer expectations in terms of investment prioritization, reliability and safety, at a cost that customers are willing to financially support through their distribution rates.[90] The plan includes environmentally focused core distribution utility initiatives, as well as innovative fuel switching, energy efficiency, demand management and renewable energy integration initiatives.

The utility's Local Demand Response project at Cecil Transformer Station in the Spadina-College area is deferring station upgrades through a novel use of battery storage and other resources, an approach touted as a leading innovation in the sector.[91] The project also contributes to supporting the Independent Electricity Systems Operator's ("IESO") CDM initiatives. Toronto Hydro intends to continue with further offerings of Local Demand Response into the future to help address the challenge of meeting the needs of a growing, global city. In doing so, the utility expects to defer millions of additional dollars in capital investment that would otherwise be needed to avoid reliability risks and to meet its obligations to its customers.

The utility is also improving the distribution system's ability to connect and enable the deployment of distributed energy resources without creating safety or reliability issues for crews or nearby customers.[92] It is reinforcing control room operations to better monitor and manage distribution-connected loads, energy delivery and

energy management needs.[93] Toronto Hydro is deploying Supervisory Control and Data Acquisition ("SCADA")-enabled remote monitoring, sensing, protection and control capabilities to modernize the grid and improve reliability and resilience.[94] The utility is also implementing hardening measures to better protect the grid against the risk of extreme and severe weather caused by climate change.[95] And, Toronto Hydro is proactively focusing on enabling electrified transit expansion projects through novel partnership agreements.[96]



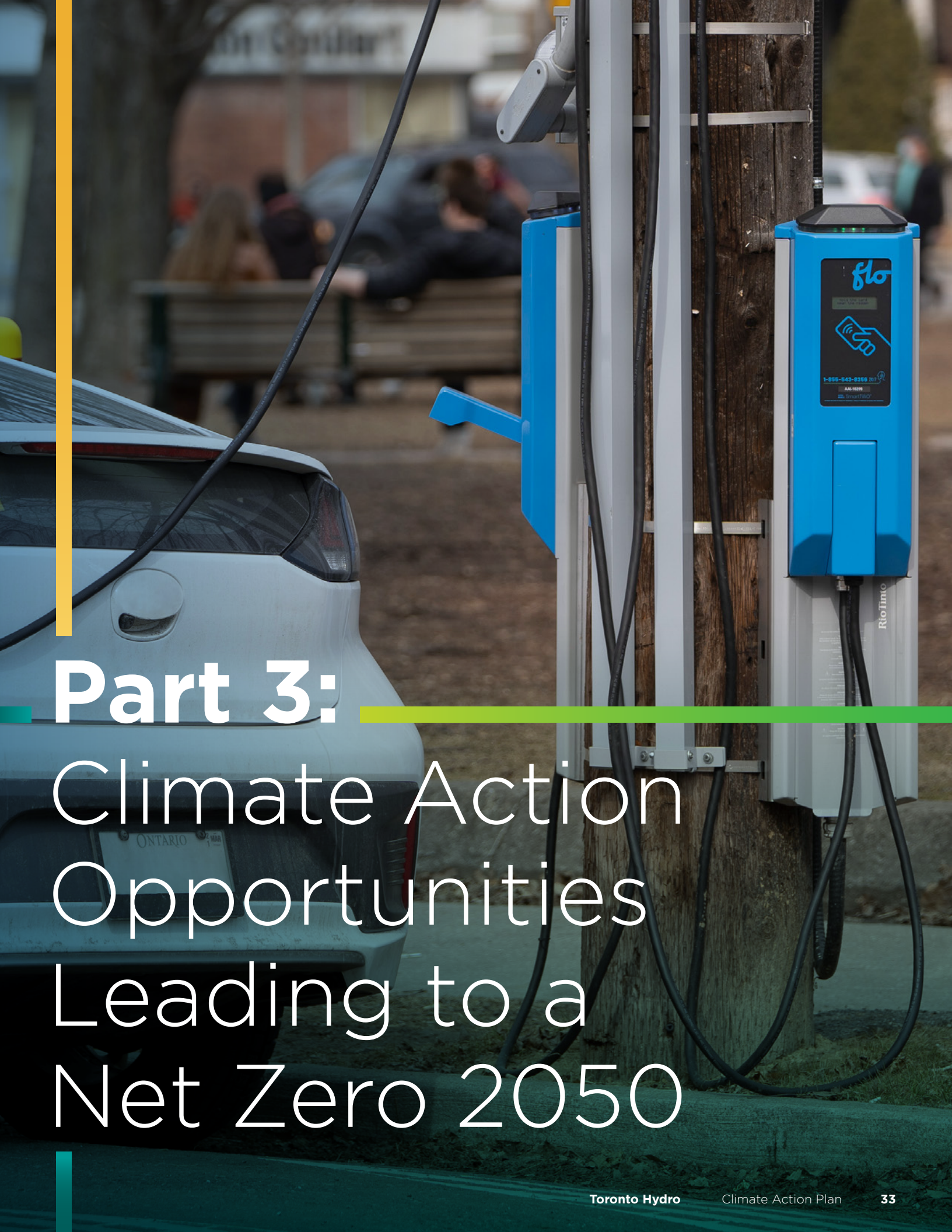
Toronto Hydro's Vision: Utility of the Future

Toronto Hydro has a rich history of being an important part of the fabric of life in Canada's largest city. It is the face of electricity in Toronto: powering growth and economic development in the city and delivering an essential service to Torontonians. Guided by the regulatory framework within which it operates and its mandate from the shareholder, Toronto Hydro's strategy for well over a decade has been to focus on its regulated operations, and it has been demonstrably successful with this approach. Against internal and external benchmarks, it has transformed into a profitable commercial enterprise driving double-digit net income growth while each year meeting or exceeding corporate measurements and key performance indicators. In short, Toronto Hydro has driven significant value to its customers, the shareholder and other stakeholders.

Notwithstanding historical success, the utility recognizes that there are markers of imminent change and uncertainty in the external environment within which it operates. Technology is rapidly advancing and customer expectations are changing, with digital control and personalized solutions becoming increasingly important to customers. Concurrently, Toronto is growing at record pace, electrification is intensifying and new technologies are being adopted in the electricity sector at unprecedented rates. The role of keeping electricity flowing safely and reliably in Canada's largest city has never been more critical, and the challenge of adapting to a changing world has never been more complex.

In 2020, Toronto Hydro refreshed its strategy to focus on leveraging the core utility model while harnessing technology and data to build an intelligent grid and transform the customer experience. In other words, Toronto Hydro is prioritizing the essential service it provides, but evolving the ways in which it provides that service. Its exciting transformation into a utility of the future is anchored by six strategic priorities predicated on key markers of change and evolution in the external environment, as shown below. Please refer to Appendix D for more information about Toronto Hydro's strategic priorities.

Toronto Hydro has and will continue to work with its customers and the OEB to align its regulated business plans with their needs and expectations, and to secure the capital and operational funding and flexibility required to transform the utility to serve customers safely, reliably and efficiently into the future. This is the pathway to achieving the financial and operational success that will drive further value for customers, the shareholder and other stakeholders.



Part 3:
Climate Action Opportunities Leading to a Net Zero 2050

Overview

In order to achieve the City's ambitious goals, climate action collaboration must necessarily occur throughout Toronto. Residents and community groups, businesses and industry associations, and different levels of government are among those who have a role to play in the City's Net Zero Strategy. Many of the solutions contemplated and underway in Toronto are designed to electrify transportation, retrofit buildings, decarbonize heavy and light duty industries, and build a more efficient, resilient grid.

Businesses that perform well and succeed in Toronto will have the opportunity to export their innovations globally. With approximately 55% of the world's population living in urban areas today, and with that proportion projected to increase to 68% by 2050, many of the solutions enabled by Toronto climate action could be exported to Canada's established and growing trading partners, and closer to home.[97]

Toronto Hydro's Climate Action Plan is designed to position Toronto Hydro as a key enabler of the City's vision of the future: to combat climate change, to spur growth in Toronto's emerging green and cleantech companies, and to contribute to greater social equity within the new economy. Indeed, the long history of public utilities in Ontario is one in which the themes of driving economic growth and advancing social and environmental objectives are pronounced and reoccurring across generations.

As it was for those who brought clean hydro-electric power to their customers in Toronto over a hundred years ago and non-emitting nuclear power a half century later, it is the task of Toronto Hydro today and in the years to come to deliver clean electricity (increasingly locally generated) to Toronto homes and businesses in the 21st century. While past action was often executed by centralized authorities, Toronto Hydro's climate action will be increasingly distributed and fit for purpose: creating a greener Toronto, a more sustainable world, and new opportunities for customers and cleantech providers alike.

Toronto Hydro's Climate Action Plan can help reduce GHG emissions by working with customers, the emerging climate-focused cleantech sector and governments. To achieve this, Toronto Hydro will leverage its expertise and excellence in core electricity distribution operations, as well as its own strategic vision for the future. Both its past accomplishments and future trajectory position the utility well to support the City in delivering an ambitious Net Zero Strategy.

Part 3A:

Expanded Business Opportunity: Electricity Distribution Business

Opportunity

In 2020, the Green Ribbon Panel reported that full electrification of Ontario's economy would almost triple electricity consumption.[98] A successful climate mitigation strategy relies on electricity distribution companies investing proactively in the grid to be ready to meet growing customer demand in the future, as well as to be able to connect local sources of renewable generation.

The City's Net Zero Strategy identifies the need for extensive fuel-shifting, away from transportation fuels such as petroleum and building heating fuels such as natural gas. It envisions a net zero future in which Torontonians overwhelmingly adopt clean electricity in place of those carbon-based sources of energy.[99] Approximately 75% of the City's Net Zero Strategy, measured in volume of GHG reductions, depends on a Toronto Hydro grid that supports the transformation. According to the Net Zero Strategy, by 2050, nearly all energy in Toronto will either be (a) supplied by Toronto Hydro, sourced from the provincial grid and local green generators; or (b) backstopped by Toronto Hydro, so that customers with self-supply have their energy needs met even when their renewable generator or energy storage systems cannot meet those needs.[100]

The City's Net Zero Strategy not only represents best-in-class leadership among cities in environmental policy, but creates tremendous opportunity for Toronto Hydro's long-term financial growth and viability: a win-win-win scenario for customers, the shareholder and other stakeholders. The regulated business model has demonstrably delivered stable financial performance, including double-digit growth in returns to the City as shareholder. It has also provided a safe and reliable essential service to power economic growth and development in Toronto for the benefit of all residents and businesses. This trajectory of industry-leading operations and financial performance can continue in a net zero future.

Extrapolating the City's scenario modelling for a net zero future by 2050, Toronto Hydro estimates that system peak demand could double by 2050, resulting in climate action grid investments of up to $10 billion through the period. In this extrapolated scenario of a decarbonized local economy powered by the grid, Toronto Hydro's regulated asset base and annual distribution revenue could grow significantly, driving both business growth and shareholder value, as well as a more efficient electricity system for all customers.

Toronto Hydro can play an ongoing and increasingly essential and transformative role in delivering clean, safe, reliable and affordable electricity to consumers, and expanding the local grid that is the backbone for Toronto's net zero energy system.

This role covers both climate adaptation (ensuring that the grid is able to withstand the weather-related effects of climate change that have and will continue to emerge as a result of previous GHG emissions) and climate mitigation efforts (ensuring that the grid is ready and able to enable electrification to reduce GHG emissions).

Climate Change Adaptation

Climate adaptation measures reduce the grid's vulnerability and exposure to the weather-related effects of climate change. Recent extreme weather experiences in the United States show that investment in adaptation is critical. In August 2021, Hurricane Ida made landfall in Louisiana, causing widespread damage to the region's power grid, including knocking out all eight of the transmission lines feeding the city of New Orleans.[101] More than one million residents and commercial customers were without power following the storm. In February 2021, record-breaking cold weather in Texas, including snow and ice, had residents turning up their electrical heating.[102] This pushed peak demand beyond the worst-case scenarios that grid operators had planned for. At the height of the emergency, more than four million people were subject to rolling blackouts.

A study of climate change impacts and costs to the United States' electricity transmission and distribution infrastructure concluded that infrastructure costs are projected to rise considerably under climate change, with annual incremental costs increasing by as much as 25% by the end of the century.[103] A proactive adaptation strategy, however, where utilities and policymakers proactively consider the risks of climate change and are willing to pay the upfront costs of adaptation before any damages occur, resulted in the expected costs of climate change being reduced by as much as 50% by 2090, compared to a scenario without adaptation. The study captured only a portion of the true impacts to the grid, as it "only included a fraction of the relevant stressor-response infrastructure interactions" and did not consider the customer costs associated with power interruptions, which the authors note "have been shown to be substantial."

As consumers and the economy become more dependent on electricity for their energy needs for critical functions like transportation and heat, the impact of electricity grid failures and power disruptions will be felt even more broadly and acutely. Without proper investment in adaptation measures on the path to net zero, extreme weather events caused by climate change could leave millions of people in Toronto without heating or cooling, transportation and other indispensable services supplied by the grid. To safeguard against this catastrophic risk, distributors have a responsibility to undertake proactive climate adaptation measures to harden their infrastructure against extreme weather events, and to modernize the grid to be able to restore power safely and efficiently in the event of an extreme weather-related failure.

Climate Change Mitigation

A significant shift toward EVs, heat pumps and other climate mitigation technologies will put pressure on grid capacity and necessitate enhanced demand management and grid optimization strategies.[104] The ultimate impact on peak demand of measures like increased energy efficiency of buildings, other CDM measures in transportation and buildings, and behind-the-meter generation is difficult to estimate. In other words, the transition to net zero will not be predictable. Demand in some areas may precede maximum efficiencies in other areas.

Despite the uncertainty, Toronto Hydro is committed to renewing the grid in accordance with good utility practice, building system capacity to accommodate load growth and developing advanced capabilities to connect local sources of renewable generation. Practically, this means that when a customer needs to charge their EV, or convert their home to electrical heating, or receive grid-supplied electricity because their solar PV and storage system is down for repairs or maintenance, or if their peak demand spikes on a particularly cold or hot day, Toronto Hydro's grid will be there to serve them safely and reliably.

Grid Renewal

Toronto Hydro's existing electricity grid was predominately built in the post-war boom era in the 1950s and 1960s. Despite major capital investment in the last decade, Toronto Hydro needs to continue to invest in renewing its aging infrastructure to avoid deterioration in system health, safety and reliability. Almost one quarter of assets are operating past their useful lives, and, over the next 25 years, a significant portion of other assets will reach their end-of-life and need to be renewed. In scoping out these replacements, Toronto Hydro can plan for climate mitigation efforts and growing customer demand.

Toronto Hydro leverages opportunities to plan for the future strategically. For example, when asked to relocate or replace its assets to accommodate major infrastructure projects (e.g. construction of the new transit systems) in the city, Toronto Hydro evaluates the need to install new infrastructure to accommodate future growth in these areas. It undertakes these opportunistic investments in conjunction with relocation or renewal work to realize construction efficiencies, minimize customer interruptions, and enable the connection of future customers in a more timely and cost-effective manner.

System Capacity

In addition to leveraging opportunities to expand the distribution grid to prepare for future growth in the normal course of renewing or relocating infrastructure, Toronto Hydro also needs to proactively invest in additional system capacity to accommodate rising peak demand driven by electrification. Demand refers to the amount of electricity required from a grid at any given moment.[105] For safety and reliability purposes, the electricity system must have sufficient capacity to meet the

"peak demand" (i.e. the highest amount of electricity that may be required at a given point in time). Major increases in peak demand require corresponding investments in new generation supply, and in transmission and distribution infrastructure to increase system peak capacity.[106]

Electrification at the scale necessary to achieve net zero will likely increase peak demand for Ontario. For example, the Ontario Energy Association in *Net Zero 2050* considered the replacement of current levels of natural gas in Ontario's energy system with electricity. It concluded that "even with considerable reduction in demand resulting from conservation demand management and demand response, Ontario would need to expand the electricity system's effective capacity by 200 to 300 percent of its current capacity to meet [the province's] peak needs."[107] Electricity distribution companies will need to make significant investments to meet and manage peak demand.

A doubling of peak demand in Toronto, for example, could require an investment of up to $10 billion by 2050 to increase system capacity and build out the grid. Depending on how the demand materializes, more than one third of these investments would be needed to expand stations to increase system capacity. As a reference point, by 2024, Toronto Hydro plans to complete the full construction of Copeland Station, a state-of-the-art 288 MVA facility, to support growth and development in the downtown core. A doubling of peak demand by 2050 in accordance with the City's Net Zero Strategy could require Toronto Hydro to build more than a dozen Copeland Stations in the next 25 years to increase system capacity.

Connecting Local Renewable Generation

A net zero future requires increased reliance on local sources of intermittent renewable generation, like wind and solar. These distributed energy resources require the utility to balance bi-directional grid energy flows. They may also enable a more flexible electricity system that can better adapt and respond to changes in demand and other impacts of climate change. Toronto Hydro is committed to making the growing and accelerating necessary grid investments to be able to connect local renewable generation safely, reliably and efficiently. In addition, the utility is committed to integrating and leveraging distributed energy resources to unlock grid benefits at the distribution level, and potentially at the bulk-system level as well, working with key stakeholders like the IESO. Toronto Hydro is leading the charge on this front with its flagship Local Demand Response program, which was designed to address short- to medium-term capacity constraints at targeted transformer stations by identifying opportunities where behind-the-meter, customer-owned distributed energy resources can be leveraged to address distribution system needs cost-effectively. In the 2015 to 2019 period, this program allowed Toronto Hydro to defer approximately $30 million in capital upgrades at Cecil Transformer Station through the procurement and deployment of 8 MW of demand response capacity. In the current rate period, Toronto Hydro is developing a competitive procurement

to secure up to 18 MW of capacity in three station areas, almost doubling the size of the Local Demand Response program by 2024.

Barriers and Mitigation

Climate action presents tremendous opportunity for Toronto Hydro, the City of Toronto, residents, businesses and the community at large to work together to accelerate the energy transition needed to meet the City's Net Zero Strategy and secure a clean energy system and economy for the future. However, not unlike other major infrastructure supporting economic growth and development, the electricity grid must be expanded and ready to serve customers before significant incremental demand materializes (i.e. before the need to connect large volumes of new load arises). This is critical to avoid constraining growth or disrupting service to existing customers. Although the current grid has capacity to accommodate a portion of the significant load increases expected under the City's Net Zero Strategy in the next 5 to 10 years, continuous investment is required to meet the peak demand challenges ahead.

Investing in the grid to safely and reliably power a decarbonized future as modelled by the City will drive uneven increases in electricity distribution rates paid for by customers, with higher rates in the earlier years, as critical capacity investments must be made before the increased load (and corresponding revenue) materializes. To illustrate, Toronto Hydro's extrapolated capital investment of $10 billion to enable the City's Net Zero Strategy could result in annual average estimated distribution rate increases for residential customers of 8 to 9% per year from 2025 to 2029 — four times greater than historical 2% inflation.[108] In the following rate period, from 2030 to 2034, distribution rates could increase by 5 to 6% per year on average to enable the required capital investment. Lesser distribution rate increases could follow thereafter.

While mitigation measures to ensure customer affordability in these early years must be explored, these distribution rate increases are potentially offset in the later years. Over time, customers may see reductions in other types of energy bills. For example, as they fuel-switch to electricity, customers may experience cost reductions for gasoline and natural gas.[109, 110] Toronto Hydro will play a key role in explaining the choices and drivers to customers, and in helping them navigate the financial pressures. As the utility becomes a customer's predominant (and perhaps, in some cases, only) energy provider, it will also play an important role in helping customers view and manage their energy use and costs holistically.

Just as the above-mentioned levels of capital investment would drive significant rate increases in the short- to medium-term, they will drive a need for additional equity to maintain the strength of Toronto Hydro's balance sheet and meet expectations of the financial market and regulators ahead of later increases in revenue. Further details about corporate financing are set out in the Confidential Appendix H, in accordance with securities law requirements.[111]

As other municipalities in Ontario follow Toronto's lead and begin modelling the specifics of strategies to achieve net zero, it is likely that other utilities and shareholders will contend with similar interim financial and rate pressures in order to realize the long-term benefits of (1) having a clean energy economy; and (2) securing a safe, reliable and affordable future energy system for all consumers.

Implementation Plan

Toronto Hydro is ready to meet the moment by playing an essential role in enabling the City's Net Zero Strategy. Investing in an *Expanded Electricity Distribution* business is an exciting way it can help to respond to the climate emergency, enable and participate in climate action, and continue to drive significant value for customers, the shareholder and other stakeholders. Toronto Hydro's implementation plan leverages the utility's core competencies and experience as an electricity distributor. This will ensure that the actions required to meet the challenge of extensive incremental electrification in a net zero future will be identified and managed proactively. By seizing the opportunities of net zero, the benefits will flow to customers, local generators, the City as shareholder and other utility stakeholders. Through partnership with the City, Toronto Hydro can build a safe, reliable and affordable local electricity grid in Toronto that serves an evolved sense of public interest: an energy system that is climate-conscious and builds socially responsible infrastructure for the benefit of current and future generations.

Part 3B:
New Business Opportunity: Climate Advisory Services

Opportunity

Overview

Toronto Hydro proposes to provide *Climate Advisory Services* that bring cleantech solutions to Toronto Hydro customers with respect to transportation electrification, building conservation and energy efficiency, and renewable generation and energy storage systems. This opportunity for incremental climate action could catalyze the local cleantech economy in a way that is consistent both with the City's COVID-19: Impacts and Opportunities report,[112] and with the City's resolution for Toronto Hydro to leverage government funding and grants, where available.[113] Notwithstanding that the Government of Canada has committed over $50 billion towards Canada's "green recovery,"[114] Toronto Hydro heard clearly from stakeholders that barriers exist to customers and service providers accessing these sources of funding in the pursuit of climate action. *Climate Advisory Services* can help address these and other barriers in the emerging climate action marketplace.

Toronto Hydro has a track record of building market capacity to facilitate customer action and investment. As discussed above, between 2006 and 2019, Toronto Hydro enabled nearly one million residential and commercial CDM projects in Toronto with $1.9 billion of government-supported funding.[115] Toronto Hydro demonstrated through CDM that it can do extraordinary things in energy advisory services and, with enough financial support, is capable of achieving even more through *Climate Advisory Services*.

Through this opportunity, Toronto Hydro could establish a new stream of unregulated operations within its regulated distribution business: *Climate Advisory Services*.[116] This business would grow the local cleantech economy in the program areas requested by City Council by facilitating fuel-switching electrification projects in transportation, buildings, and renewables and energy storage that are developed, owned and operated by others.[117] Drawing on its energy advisory services successes, Toronto Hydro would use its knowledge, experience and relationships, including those with its customers, to navigate funding issues and support the execution of climate action projects by bridging gaps that can exist between customers, suppliers, innovators, governments and other key stakeholders.[118] Toronto Hydro could stimulate investment in climate action as the honest broker between customers, governments and cleantech, rather than competing with local companies.

The activities of the *Climate Advisory Services* business would be self-funded by Toronto Hydro. Provincial legal and regulatory frameworks do not allow the unregulated activities contemplated in the *Climate Advisory Services* to be funded by distribution rates (see Appendix E). However, the frameworks do allow Toronto

Hydro to leverage its core utility capabilities to provide advisory services that promote energy efficiency, conservation and load management. Toronto Hydro estimates it will be able to self-fund up to approximately $15 million per year to operate and administer *Climate Advisory Services*. The costs to build, own and operate the projects themselves would require separate funding, which is discussed further in Part 4 and Appendix F.

During the initial stages of developing this new business and its relationships with customers and the cleantech sector, Toronto Hydro does not propose to charge for these services. This is when Toronto Hydro will develop and refine its service offering in the climate action sector. Over time, as the value proposition crystalizes and operating performance hits its stride, Toronto Hydro may be able to revisit the use of charges to recover its costs and transition the *Climate Advisory Services* function into a commercially viable operation. Further, Toronto Hydro as a whole will financially benefit from the *Climate Advisory Services* business over time through the increased and accelerated electrification driven by *Climate Advisory Services* work, and the customer and cleantech projects it supports.

Toronto Hydro believes that *Climate Advisory Services* is the best approach to achieve incremental climate action beyond the *Expanded Electricity Distributor*. A *Climate Advisory Services* business model best enables Toronto Hydro to do more climate action for less money, because it establishes the foundations needed to connect customers to climate action opportunities. In this way, Toronto Hydro would operate as an ally to the local cleantech economy, supporting the access to federal and provincial government subsidies, customer investments and cleantech capital. There is a spectrum of government programs and electricity market revenue opportunities which may be available to the types of projects reviewed in the program area summaries in Part 4.

Toronto Hydro assesses that *Climate Advisory Services* provides the best opportunity to drive growth in a local cleantech economy and encourage innovation in energy-related climate change solutions. Toronto Hydro's efforts would be particularly focused on areas of the local cleantech economy which have been slow to develop and which are currently fragmented or underserved by commercial options, but which have real potential to deliver GHG reductions and equity in access to electrification.

From Toronto Hydro's experience with CDM, *Climate Advisory Services* has the necessary scale, experience, technical proficiency and support from Toronto Hydro to significantly reduce GHG emissions through effective and affordable climate action. Toronto Hydro can help educate and inform customers and the community about why climate action is urgently necessary, how electrification solutions address GHG emissions, and what they can to do participate.

Customer-Centric Climate Action

Toronto Hydro's proposal for *Climate Advisory Services* begins from the principle that the City's Net Zero Strategy is a shared responsibility and opportunity. Toronto Hydro's successes with the CDM business demonstrate how the advisory services model can be highly successful when stakeholders work together. A *Climate Advisory Services* business would engage in customer-facing operations, providing energy services similar to those which Toronto Hydro provided for over a decade in the field of CDM,[119] but instead focusing on the climate action program areas that the City requested Toronto Hydro to consider.[120] *Climate Advisory Services* would serve as an energy advisor to assist customers with project management, technical expertise and funding opportunities. It would work closely with customers in their process of evaluating the economic feasibility of these investments, applying for grants, assisting with bidding into the IESO markets and procurements for capacity and ancillary market services and related revenues, and identifying reputable vendors for buying, installing and maintaining this equipment. Moreover, by leveraging Toronto Hydro's existing customer relationships, *Climate Action Services* can use Toronto Hydro's rigorous procurement process to develop a suite of service providers available to customers.

Climate Advisory Services operations can be performed without the need for any direct financial support to Toronto Hydro from any level of government or the marketplace, allowing government and customer funding to be directed exclusively to projects. In doing so, *Climate Advisory Services* can advance three core objectives: (1) reducing GHGs, (2) supporting the local cleantech economy and (3) advancing social equity.

Several stakeholders identified that a climate action enabler with credibility in the community was needed to facilitate greater climate action to help drive the cleantech innovation economy. Toronto Hydro also heard that it should not stand in the way of cleantech commercial developments or impede the growth of the climate action market by competing for customers and government funding.

Stakeholders advised that barriers to climate action are not all economic — there are other practical considerations that make taking climate action difficult. These stakeholders identified that an entity such as Toronto Hydro would be well-positioned to provide this service and that a *Climate Advisory Services* business within Toronto could address this need.

To help illustrate the barriers *Climate Advisory Services* could help overcome, consider the process of installing a residential heat pump. Right now, customers have to: (1) identify competent cleantech vendors and installers; (2) dedicate time to obtain quotes; (3) navigate subsidy programs available from governments; (4) select a solution knowledgeably; (5) coordinate electrical service upgrades with the distribution utility; (6) consider whether building by-laws allow for this activity;

(7) overcome unfavourable economics and uncertain benefits of the project; (8) accept the sunk cost of replacing functioning equipment; (9) oversee construction; and (10) monitor the energy savings of the project.

Climate Advisory Services could be the "one-stop shop" that makes it easier for consumers to take climate action. Maintaining a list of qualified material and service vendors, assisting customers with evaluating their project's eligibility for government subsidies, educating customers, acting as technical support, providing an economic evaluation of the proposed project and following up with the customer to establish feedback loops to assess and improve performance are all value-added services that could be provided.

In addition, stakeholders identified several barriers and solutions that relate to information, communication and logistical gaps that exist between: (a) customers seeking climate action; (b) governments looking to fund green initiatives to spur innovative; and (c) providers of cost-effective green solutions and technology. These, too, could be mitigated through *Climate Advisory Services*. Appendix G summarizes the barriers experienced today, the means by which *Climate Advisory Services* is designed to help address the barriers and the potential improved climate outcomes.

Reducing GHGs and Supporting the Local Cleantech Economy

While some climate action projects may be economic, climate action often requires subsidies to become economically feasible. Private capital is not being invested in available solutions at the pace and scale needed to respond to the urgency of climate change. This market gap presents both a need and an opportunity for Toronto Hydro to stimulate climate action and reduce GHG emissions.

Climate Advisory Services could help meet this need and opportunity by coordinating and filing applications for grants and financing opportunities on behalf of stakeholders for climate action projects. By tapping into its deep experience with government funding applications and assistance program implementation, Toronto Hydro could be an effective conduit between residents, businesses and institutions looking to undertake innovative electrification or efficiency initiatives and the government programs looking to support such action. *Climate Advisory Services* could also improve customer access to those funds by aggregating smaller projects to meet government support thresholds, or including small projects within the scope of larger ones.[121] Combining similar projects could drive procurement costs down and achieve economies of scale when purchasing materials or contracting with vendors. *Climate Advisory Services* could engage in a number of other CDM-like activities with customers, as set out in the programs discussed in Part 4, all of which could stimulate tens of thousands of climate action projects in Toronto. The services model would support the rebuilding and recovery of the Toronto economy post-COVID by facilitating private sector cleantech development.

There is a broad spectrum of government funding sources available for energy-related projects that reduce carbon emissions. Toronto Hydro identified approximately $6 billion in Canada-wide grants that are currently available and will be available in the coming years to support climate action. On an annual, per capita basis, Toronto businesses and institutions should be receiving approximately at least $92 million per year of that funding for climate projects. There is an additional $10 billion in climate loan programs. Although federal funding is spread across Canada, Toronto is strongly positioned to receive a significant share. The size and density of population, the access to qualified cleantech providers and equipment, and a utility willing to steward the deployment of climate action funds creates an opportune environment for projects of national importance.

Funding programs can be very complex and stringent in their requirements. *Climate Advisory Services* could develop core expertise and make it available to its customers and cleantech collaborators. This would create economies of scale, leading to more Toronto households and businesses tapping into more funding opportunities and with potentially improved odds of success.

With funding from federal and provincial governments, investment by cleantech and contributions by customers, Toronto Hydro expects *Climate Advisory Services* will facilitate investment of up to $3.5 billion in climate action:[122]

TH-Supported Climate Programs	Cost ($M)	Program Size	Impact
Transportation Electrification	600	50,000 chargers	Serving 1 million+ EVs
Buildings Electrification	600	60,000 heat air pumps	15% of all buildings
Renewables + Storage	2,300	300 MW of local generation	300,000 projects
TOTAL	**3,500**		

Through *Climate Advisory Services*, Toronto Hydro could also help the market capitalize on the rise of environmental, social and governance ("ESG") mandates when canvassing for investment in economic climate action projects. Projects that meet ESG requirements are currently being funded at record levels, and many countries and global organizations are driving investment that is targeted at sustainable, resilient economic systems.[123] Thus, marketing the ESG opportunities of climate action projects in Toronto can help maximize capital investment.

Toronto Hydro has divided its *Climate Advisory Services* opportunities for electrification into the three programs identified by the City: (1) Transportation Electrification; (2) Building Conservation and Energy Efficiency; and (3) Renewable Generation and Energy Storage. Part 4 provides a detailed overview of these prospective projects, which could be undertaken with local cleantech firms and customers.

Advancing Social Equity

Through *Climate Advisory Services*, Toronto Hydro expects that it will be best positioned to participate in community mobilization to address the impacts of climate change. Climate change disproportionately affects certain populations, including seniors, people with health conditions, people with low incomes, those experiencing homelessness, and Indigenous and racialized communities. Social equity and supporting community resilience will be a focus of *Climate Advisory Services* when executing its mandate, examined on a case-by-case basis. Many grants and financing opportunities require an element of social equity. Through relationships with equity-seeking groups in the city, Toronto Hydro could help establish climate action collaborations to identify creative climate action solutions that have equity benefits, and help get those projects funded and built.

Barriers and Mitigation

Toronto Hydro estimates that the cost of this option would be up to $400 million through 2050. To finance this, Toronto Hydro has identified that it can stretch its existing financial resources to allocate up to $15 million per year to self-fund this initiative. Through *Climate Advisory Services*, Toronto Hydro anticipates it can help mobilize up to approximately $3.5 billion worth of unregulated climate action projects through customer and government contributions. This level of investment in Toronto would grow the economy and create higher-paying energy efficiency jobs.[124] In turn, innovations in technology and declining equipment costs could further accelerate the speed of electrification in Toronto, resulting in a virtuous cycle of climate action.

Self-funding will allow Toronto Hydro to:

- Stimulate significant investment in cleantech in Toronto
- Provide a pure value-add role to stakeholders
- Foster the local cleantech economy at a level that will not negatively impact the core distribution business
- Direct all available government funding to GHG reduction projects

As Toronto Hydro invests in the distribution system in support of net zero, Toronto Hydro's net income is set to increase. Toronto Hydro is the backbone of the city's energy system and that role will become even more critical with the greater electrification required to address net zero. While drawing on self-funding, *Climate Advisory Services* will also benefit Toronto Hydro by accelerating and increasing electrification, leading to revenue growth in the regulated distribution business.

Toronto Hydro, however, must be mindful that it is a highly regulated utility providing critical electricity distribution services for hundreds of thousands of customers in Toronto, and funding *Climate Advisory Services* cannot compromise this objective or result in material adverse consequences to the finances of Toronto Hydro. Despite potential growth in distribution revenues, it is important to understand that self-funding would impact net income. It would result in lower net

income than may have otherwise been achieved if no expenses had been incurred for *Climate Advisory Services* or if such expenses were externally funded. Through the recommended approach, and having carefully considered the proposed self-funding levels, Toronto Hydro is confident that it can achieve an appropriate balance of outcomes through *Climate Advisory Services*.

Implementation Plan

Making a meaningful climate impact is a long-term strategy. Toronto Hydro is committed to ramping up quickly to facilitate the growth, action and performance of the local cleantech economy. The long-term success of *Climate Advisory Services* depends on finding high-GHG impact opportunities aligned with the City's climate, social and environmental goals. These projects contribute to the sustainable growth of the climate action economy in Toronto and the cleantech firms driving that market.

Toronto Hydro would assemble a highly skilled team with a mix of sales experience, technical expertise, project management and administration experience in the electrification sector. This team would advise on project identification, development and delivery; manage customer relationships; engage with contractors, suppliers and industry partners; and identify funding sources. Existing relationships with cleantech providers formed through CDM programs could be leveraged to quickly launch and promote *Climate Advisory Services*. This team would likely grow proportionately as the volume of customer-driven and cleantech-developed climate action projects grows. Key performance indicators could be established to monitor, evaluate and report on progress made towards carbon emissions reductions.

Governments will be a key partner for Toronto Hydro in the climate action cause. Local governments shape how buildings are constructed and what kinds of energy they use, whether buses and police cars run on electricity and whether there is a charging infrastructure for EVs.[125] They can also supply funding for climate action, help advocate for additional climate action funding from higher orders of government and provide feedback to enhance program offerings. However, the need for sufficient government support cannot be stressed enough. The success of the *Climate Advisory Services* model depends on preserving and growing those funding sources.

A high standard of customer service is also imperative to achieve climate, economic and equity objectives. Bad experiences in the local marketplace (e.g. fraudulent cleantech providers) during implementation will drive others away. Toronto Hydro's rigorous procurement practices can identify leading cleantech firms with a long-term commitment to customer service and GHG emissions reduction potential.

Part 3C:
New Business Opportunity: Climate Capital Investments

Opportunity

Climate Capital Investments is a third opportunity for Toronto Hydro climate action. Outdoor lighting could be modernized through *Climate Capital Investments*. Toronto Hydro owns and operates the streetlight system through its unregulated subsidiary,[126] Toronto Hydro Energy Services Inc. ("THESI"), which could convert its traditional system to an LED system to improve lighting quality, realize financial savings and reduce overall GHG emissions. Toronto Hydro would require a mandate from City Council to pursue the LED streetlight conversion and would collaborate with the City's Transportation Services Division to develop an implementation plan for this climate action.

Climate Capital Investments could be used for projects other than outdoor lighting to pursue other areas of climate action identified by the City, if the City or another stakeholder identifies a project: (a) that the *Expanded Electricity Distributor* cannot do for regulatory, financial or other reasons; and (b) where there is no cleantech market interest or there are insufficient federal or provincial government subsidies available to make the project economically feasible. For Toronto Hydro to undertake such a role in projects with economic challenges on a case-by-case basis, the financial support of the City would be required to the extent that the project customer or recipient was not paying all project-related costs.

During the process of developing Toronto Hydro's Climate Action Plan, some stakeholders indicated interest in Toronto Hydro using its construction and asset management expertise to directly build, own and operate climate projects such as transportation electrification, building electrification and energy efficiency, and renewable generation and energy storage systems. But taking such an approach to climate action through direct ownership and operating responsibilities through a new, unregulated business could place Toronto Hydro in direct competition with cleantech providers.[127] *Climate Capital Investments*, however, can take a different approach: being activated where cleantech providers are unable to act directly, instead of competing with them. The *Climate Capital Investments* model could allow the City or Toronto Hydro to identify projects of their own choosing where there is an advantage to Toronto Hydro directly delivering the projects and owning and operating the newly built assets.

Barriers and Mitigation

Toronto Hydro does not foresee significant implementation hurdles to modernize outdoor lighting. For more on the proposed program, see Part 4.

For climate action in the other areas identified by the City, *Climate Capital Investments* presents challenges that do not exist for the *Climate Advisory Services* model. The first is the implied relationship with the cleantech sector. Under an unregulated investment model, Toronto Hydro could compete with cleantech for customers and government funding of climate action projects. This contrasts to *Climate Advisory Services*, which is built upon partnership with local cleantech businesses and benefits from their innovation and expansion of solutions offerings. When engaging stakeholders during the development of the Climate Action Plan, Toronto Hydro heard the concern that a *Climate Capital Investments* business that competes with local businesses for customers and government support could be at odds with the City's post-COVID recovery and rebuild strategy. Moreover, the activities of the new, unregulated *Climate Capital Investments* business would also need to be undertaken at arm's length from Toronto Hydro's regulated electricity distribution business.[128] *Climate Advisory Services* requires openness and trust, which would not be forthcoming from cleantech companies concerned that Toronto Hydro's *Climate Capital Investments* business would take advantage of commercially sensitive insights, poach their best leads, and put its own interests ahead of theirs in dealing with governments and other key stakeholders.

The second is the financial risk posed to other Toronto Hydro businesses. Toronto Hydro already relies heavily upon debt from the capital markets to fund its core distribution operations. Toronto Hydro is able to access affordable long- and short-term debt as a result of both the stable regulatory system in place in the electricity industry in Ontario and the company's record of successful business operations. This success has long been recognized by Toronto Hydro's credit rating agencies.[129] Ensuring that access to corporate finance remains available to Toronto Hydro will become even more important as the need grows to modernize and expand the electricity distribution system to address the shift away from fossil fuel-based energy. Toronto Hydro's capital finance tools will be fully deployed by the expansion of its distribution system. In addition, because they are not funded by regulated distribution rates, projects under the climate action program areas do not benefit from the same systemic regulatory support as the distribution business and will

not be able to independently procure the same low-risk cost of financing. Instead, if owned under *Climate Capital Investments*, the financial markets may view these activities as a higher risk to the consolidated Toronto Hydro business. As noted, the increased financial needs of the distribution business will put a focus on Toronto Hydro's borrowing capacity. For these reasons, additional financing for competitive unregulated businesses is not sustainable for Toronto Hydro.

With these challenges in mind, if the City establishes a mandate for Toronto Hydro to establish a *Climate Capital Investments* business that extends beyond the streetlighting conversion, Toronto Hydro proposes to not focus on competition with the emerging local cleantech companies but, rather, complement the work of those companies by pursuing projects that the market does not pursue where an important City priority is addressed. Using *Climate Capital Investments* to complement the climate action taken through *Climate Advisory Services* would mitigate both the cleantech conflicts and financial risks that would otherwise be present.

As such, Toronto Hydro is committed to not competing with developing cleantech firms for government support. While the market continues to develop and grow in the local economy, Toronto Hydro will not be focusing on government support to finance its own competitive businesses. Instead, where a prioritized project is identified as not being supported by the local cleantech market, the City would need to make an investment to support such a project. In such cases, *Climate Capital Investments* would be available to procure, own and operate electrification/fuel-switching assets and provide related services where directed by the City. Toronto Hydro expects that, in taking on these unique projects, there may still be important ways for local cleantech firms to provide support. But to do so, the City would need to provide an upfront equity contribution to Toronto Hydro or allow a portion of the organization's debt-borrowing capacity to be reallocated to such projects through a dividend policy change. Toronto Hydro procurement would be subject to receipt of such equity contribution or dividend reallocation equal to the amount of the initial investment required by the project, and amounts required to operate the project not otherwise funded by the end user or customer.[130] Such an investment by the City would protect dividends to an extent by stabilizing against negative impacts to Toronto Hydro's credit rating through offsetting equity against increased debt loads. It would also preserve Toronto Hydro's net income against losses arising from investments in projects which do not provide a return. The *Climate Capital Investments* approach may be particularly applicable to delivering programs where economic challenges create a barrier to providing opportunities for social equity or vulnerable customers in line with TransformTO's principles, until such programs become financially viable for local cleantech firms to take on.

Implementation Plan

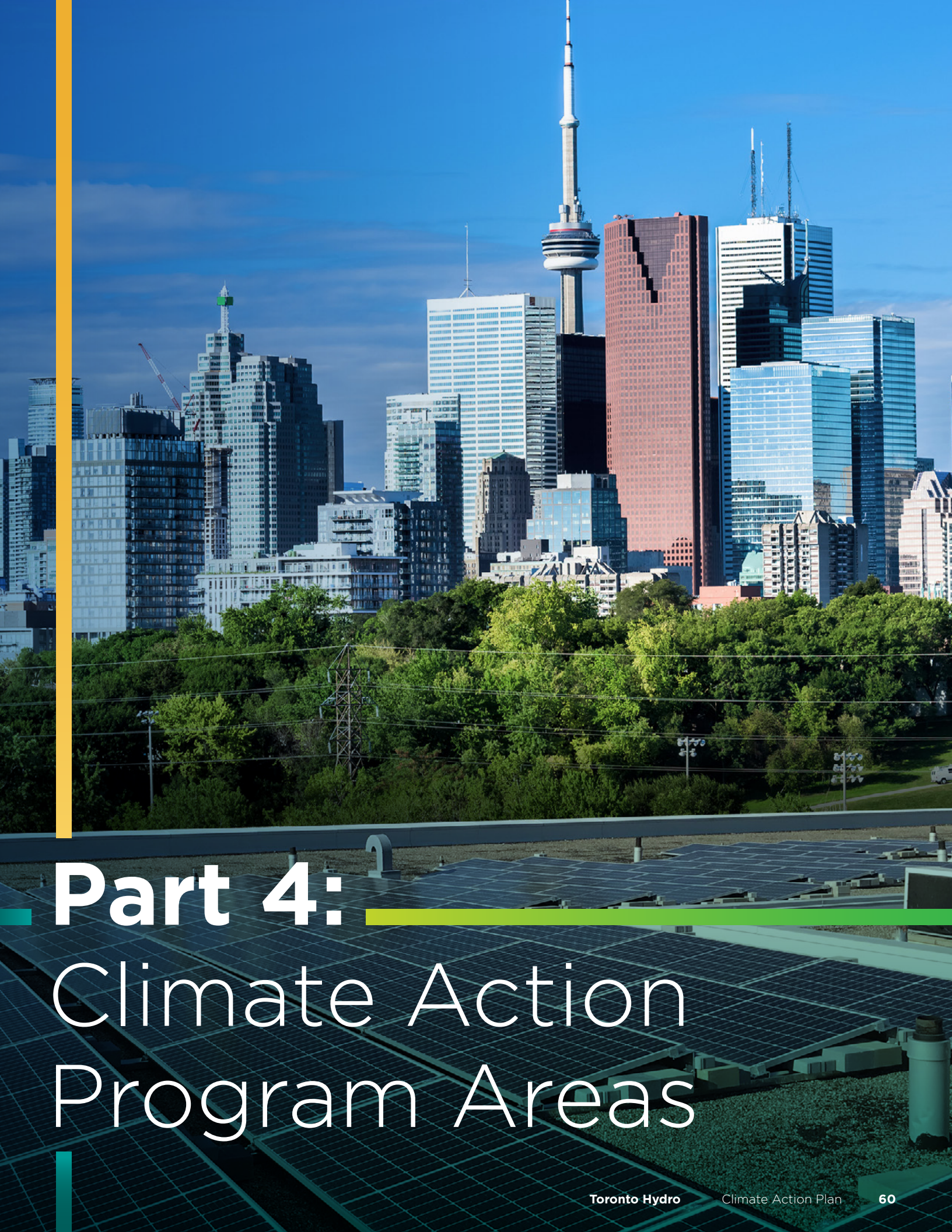
The vast majority of Toronto Hydro's streetlighting system is made up of traditional halogen-style low-efficiency bulbs. To address climate action in outdoor lighting, Toronto Hydro proposes to convert the streetlight system to modern high-efficiency LED bulbs as has been done by the vast majority of municipalities throughout North America (the proposal to complete the streetlight bulb modernization is reviewed in Part 4). THESI would undertake the conversion and would continue to own and operate the modernized system. This project could result in significant energy savings, community benefits and GHG emission reductions. It may also be eligible for certain federal, climate-oriented, low-interest loans, repaid through savings in energy costs. Toronto Hydro would work with the City's Transportation Services Division to develop a comprehensive agreement.

A separate mandate would be required from City Council for the establishment of a *Climate Capital Investments* unregulated affiliate business for use on a case-by-case basis. Implementation would begin with the formation of a new legal entity following a direction from City Council. While many staff from Toronto Hydro's regulated distribution business would be precluded from doing work for this company, certain corporate services personnel may be permitted to do work for both companies, so long as various OEB rules are followed.[131]

Working closely with the City's Environment and Energy Division and other City departments and agencies, *Climate Capital Investments* could focus on identifying significant projects which, after comprehensive review, are not supported by necessary resources in the local marketplace nor federal or provincial government funding. The partnership with the City and its relevant departments and entities will be crucial in identifying the projects due to the limitations on *Climate Capital Investments'* ability to rely upon customer and other information from the distribution business. Such projects would focus on electrification and energy efficiency, filling a gap where important City priorities are unable to be met directly by local cleantech companies at the time. *Climate Capital Investments* would deploy its own internal expertise and that of the developing cleantech marketplace. When a project is identified and the appropriate City financial support mechanism put in place, Toronto Hydro can begin procurement. Where funding is provided by the City, Toronto Hydro would utilize reallocated debt-borrowing space, with customer fees arising from the projects, if any, being used to service that indebtedness.

Toronto Hydro recommends that a minimum investment value threshold (e.g. $25 million) on a per project or overall program basis be implemented so that this model operates in an economically efficient manner and to lessen incremental administrative costs. This would allow Toronto Hydro to minimize costs compared to the size of the investment, allocate appropriate resources upfront in deploying identified projects, focus on projects with significant emissions-reduction potential, and achieve commercial viability with such projects.

Along with the City, Toronto Hydro would establish milestone timelines for completion of the projects implemented under *Climate Capital Services*, as well as key performance metrics and progress reporting requirements, to ensure related City priorities are delivered.



Part 4: Climate Action Program Areas

Introduction

This section provides an overview of the climate action program areas, and examples of the types of projects that could be facilitated by Toronto Hydro for the benefit of customers and the community. Based upon an extensive review of the market for climate action, Toronto Hydro concluded that *Climate Advisory Services* would be best positioned to deliver on the goals of the Climate Action Plan through partnership with local cleantech firms and customers. The projects are designed to deliver GHG reductions efficiently, develop the local climate-centred cleantech sector, and focus on social equity in accessibility and outcomes. In particular, they target areas of electrification in the local economy that are in an early stage of development and are currently fragmented or underserved by commercial options, but which have potential to deliver significant GHG reductions and advance equity in access and outcomes.

With support and guidance from Toronto Hydro's *Climate Advisory Services* function, the investments would be made by climate-conscious customers and local cleantech firms. While not exhaustive or compulsory for the Climate Action Plan's success, the identified projects illustrate the range of climate action that can be stimulated by Toronto Hydro's *Climate Advisory Services*, and exemplify what can be achieved through effective partnership with local businesses, customers and governments. As noted earlier in this report, the *Climate Capital Investments* business could own and operate unique projects on a case-by-case basis in these program areas. The proposed LED streetlight conversion is one of those unique projects suitable for *Climate Capital Investments*.

Transportation Electrification

EVs are critical to achieving a net zero future. GHG emissions per kilometre driven can be reduced by 87 to 96% by switching from a comparable compact, full-size or mid-size gasoline car to an EV or plug-in hybrid EV.[132] To increase the uptake of EVs, the City's EV Strategy identifies four key actions: (1) increasing charging infrastructure; (2) reducing the cost of owning and using EVs (particularly to those without public charging); (3) increasing consumer confidence that charging is available and ubiquitous; and (4) capturing the economic benefits of a transition to electric mobility.

In a 2021 report, the Pembina Institute identified a need to improve intergovernmental policy and program coordination to ensure efficient and effective use of public spending and continued private sector investment in Ontario's EV sector.[133] This need can in part be fulfilled by Toronto Hydro's *Climate Advisory Services* bringing together cleantech (and related companies), customers, potential funders and other market participants to coordinate and enhance the effort of developing sufficient EV supply equipment ("EVSE") in Toronto.

As noted in Part 1, Toronto Hydro has significant experience with EVs. Through its own pilot projects with the City and the Toronto Parking Authority, Toronto Hydro has learned about many of the barriers to getting EV chargers built. The utility can use this knowledge and experience to unlock market opportunities for the cleantech sector and the EV customers that they serve through the *Climate Advisory Services* function. This work will include collaboration with potential host sites to remove barriers to making chargers available, as well as collaboration with federal and provincial governments to enhance EV policies and provide financial assistance to facilitate the development of EVSE in Toronto.

With Toronto Hydro's *Climate Advisory Services* support, cleantech and related companies could deploy leasing and public charging models of EV chargers to residential, multi-unit and commercial customers to enhance their access to EVSE with lower upfront costs. This is a key barrier that must be removed to stimulate EV uptake. In turn, removing this barrier for building owners and commercial enterprises means that their properties and businesses will be more attractive to tenants and customers. In other words, the benefits to be derived by these actors and partners will likely extend beyond lower fuel costs for their users. It will give

their properties and businesses a green competitive edge with climate-conscious tenants and customers.

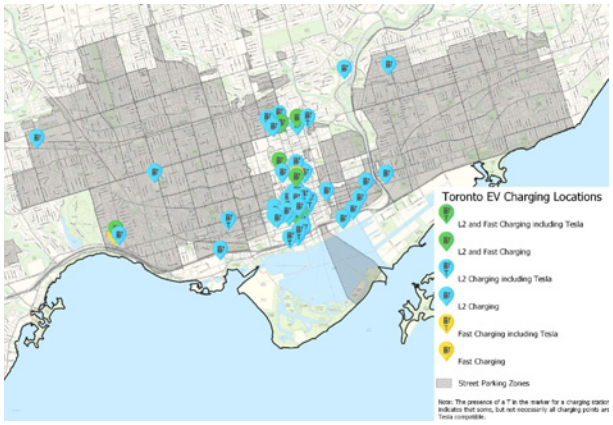
Toronto Hydro could facilitate market investments in delivering an EVSE program with the following attributes, based on the projects described below.

Transportation Electrification Program Potential Attributes to 2050	
Program Assets	Lease of EV chargers to residential, multi-unit and commercial customers and public charging
Program Costs ($M)	600
Number of Units Installed	50,000

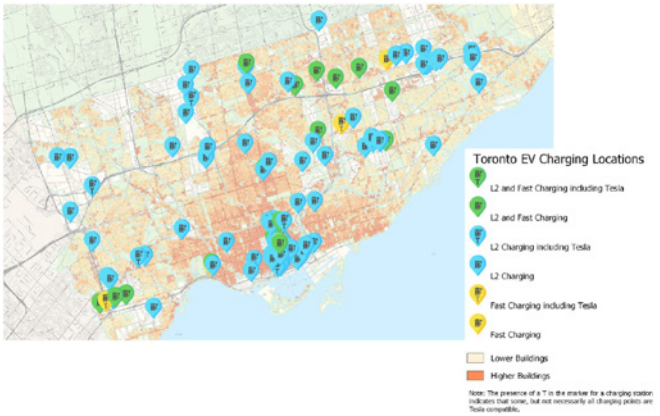
Toronto's Charging Landscape

The bulk of Toronto's housing stock is not conducive to at-home charging. Of the 1.1 million-plus occupied private dwellings within the city, over 59% are located in high-rise and low-rise apartments.[134] In addition, Toronto encompasses many neighbourhoods that have no access to garages or driveways. In comparing Toronto's housing stock to public EV charging locations, it is evident that the current number of EV charging stations in the city will not be sufficient to incent and serve EV adoption growth rates.

Garage Orphans[135]



Multi-Unit Residential Buildings[136]



Source: City of Toronto Electric Mobility Strategy Assessment Phase, FINAL Project Report, December 2018

From this analysis, Toronto Hydro concludes that greater emphasis needs to be placed on public curbside, residential multi-family and public parking charging options. This is key to accommodating the expected growth in EVs and, most importantly, to prevent EV charging infrastructure from becoming the predominant barrier to the mass adoption of this technology, which is necessary to achieve net zero.

Prospective Projects

Through the *Climate Advisory Services* business, market investment in EVSE can be facilitated to increase (1) EV charging at home and for light-duty commercial fleets; and (2) public EV charging infrastructure. This could be accomplished through a

combination of both contracted charging services on private property and pay-per-use charging services in public locations.

EV Supply Equipment Financing for Residential Customers

Toronto Hydro's cleantech partners and related firms would assist residential homeowners[137] with respect to the selection and installation of EV charging stations, as well as financing the equipment at attractive rates targeted to drive adoption. Toronto Hydro could provide advisory services to coordinate equipment installation with qualified electricians and support customer enrollment in future load curtailment programs. The product offering would be especially conducive to 240v Level 2 chargers, which would provide faster service than traditional at-home chargers.

Market research shows that there is a dearth of financing solutions from auto manufacturers for EVSE and very little support for prospective EV customers in product selection or installation. Through the proposed program, local firms working with *Climate Advisory Services* can fill this market void by providing prospective EV customers with an easy solution for financing or leasing EVSE, thus removing a key barrier to EV uptake.

In addition, this program could also support the collection of Clean Fuel Standard[138] credits generated from EVs. A program aggregator could make this process easy and beneficial for customers by collecting and redistributing credits earned through residential charging services. Finally, *Climate Advisory Services* could utilize distribution system information relating to EV charging behaviour to evaluate new programs and create cost-effective solutions that benefit ratepayers.

EV Supply Equipment Financing for Commercial and Multi-Unit Residential Customers

The financing program for commercial and multi-unit residential customers would have similar characteristics to the residential program, except that customers would be able to select dedicated EVSE per parking space or shared equipment for a pool of vehicles with options to set up pay-per-use fees.

This program could assist commercial and multi-unit residential customers who do not have the technical expertise or financial capability to invest in EV charging infrastructure for their buildings. It could also forge a longer-term financing and operating relationship with commercial customers who might favour the simplicity of a turnkey project and the security of dealing with a trusted provider over an extended period of time. This could be delivered by Toronto Hydro's *Climate Advisory Services*, for example, through an accredited supplier framework. In the future, *Climate Advisory Services* could also help customers unlock additional value from these assets through Clean Fuel Standard credits and grid-level demand response capabilities.

Public On-Street/Lot Charging

Public on-street and lot charging projects involve securing EVSE access to parking sites and making EV charging infrastructure available to the public. Sites can be in the public right-of-way where on-street parking already exists, or in public parking lots (either municipally or privately owned).

Using available data on reducing barriers of EV ownership, projects like these could deploy public EVSE in key areas of the city, such as where parking crosses a mix of workplace, residential and commercial applications. The program would also focus on siting fast chargers in neighbourhoods where car owners rely on street parking and do not have access to EV charging near their home. Where there is a lack of on-street opportunities, the program could work with off-street parking lots to make EV charging accessible to the public.

In facilitating a public charging program, the *Climate Advisory Services* business could help local firms provide greater charging options by building on Toronto Hydro's existing relationships with various city agencies, including the City's Transportation Services Division and the Toronto Parking Authority. Lessons learned from early pilot projects would be integrated to improve product design, costs, stakeholder engagement and contracting. In addition, Toronto Hydro could facilitate customer engagement to understand EV charging behaviour in various settings. Using this and related types of information, Toronto Hydro could create programs that can shape and incent charging to optimize use of the grid and deliver benefits to both ratepayers and EV drivers.

Social Equity Initiatives

For many customers, an EV is still not an affordable option. However, as EVs increasingly come into the customers' price range, the availability of a publicly accessible chargers in locations where they frequently park (e.g. condominium, workplace, shopping centres) may accelerate EV purchases by years.

Under the Residential EVSE and Multi-Unit Residential Buildings ("MURBs") financing programs, lower cost or no cost options could be provided to vulnerable populations and communities using appropriate government funding. Critical to the success of the public charging program will be locating charging facilities in neighbourhoods that currently are under-represented in EVSE access.

Market Economics

Financial modelling shows that partners and customers could achieve a commercially reasonable payback period on their investments as part of the EVSE financing programs described above.[139] This is based upon comparing a EVSE financing program to market interest rates for a home product loan.[140] While

the projected financing rates are cost-competitive with the market for a general unsecured loan, they can be made even more attractive to residential and commercial consumers in order to achieve the adoption levels contemplated by TransformTO. Government support allowing for subsidized charger financing rates then will become particularly important to entice suppliers into delivering options and driving customer adoption, particularly among lower-income customers.

Financial modelling for the pay-per-use public EVSE program showed that charging rates according to a commercial payback period were not competitive with current prevailing pay-per-use rates across the different EV charger levels. Looking at prevailing markets for pay-per use EV charging, Toronto Hydro observed that public EV charging is often offered as an amenity to other business operations, for example, in a retailer's parking lot. From this observation, Toronto Hydro deduced that the prevailing market rates are likely not determined on a standalone economic basis — that they are likely priced low to attract customers and users to the amenities where public charging is being offered. It would be reasonable to conclude that, over time, as the demand for EVSE increases, the price will correct to reflect the economics. However, until such time, the market economics indicate that it is necessary to subsidize the rates charged for pay-per-use public charging.

Building Conservation and Energy Efficiency

Meeting the City's Net Zero Strategy requires eliminating GHG emissions from Toronto homes and buildings before 2050. Existing buildings are Toronto's largest source of emissions, accounting for about 55% of total community-wide emissions. Natural gas used in space and water heating represents 91% of all emissions from Toronto's buildings and almost 97% of emissions from residential buildings in particular, making the reduction of natural gas use a critical focus of emissions reduction efforts.[141]

Electrification of space and water heating systems is essential to achieving the deepest GHG emissions reductions possible and represents the most impactful retrofit measure. Electrification of heating systems is made most effective in tandem with retrofit actions that reduce overall demand for energy, specifically in space heating (i.e. envelope upgrades), to mitigate energy cost increases and impacts on the distribution grid. The residential sector has the largest emissions reduction potential by virtue of having space and hot water heating loads that can be reduced with envelope upgrades and then decarbonized through efficient electrification (e.g. heat pump technologies).[142]

The level of investment required for net zero buildings is enormous and vastly beyond the reach of a single facilitator. For City of Toronto-owned buildings alone, the estimated cumulative investment required to achieve the City's net zero emissions targets over the next 20 to 30 years ranges from $2.6 billion to $4.1 billion, depending on how quickly the City is able to support the investment.[143]

While substantial cost challenges exist, meaningful climate action can still be obtained by prioritizing projects that return the largest GHG reductions at the lowest cost. The ultimate goal for Toronto Hydro *Climate Advisory Services* is to help stakeholders unlock long-term, repeatable, affordable and self-sustaining solutions to eliminate GHG emissions from Toronto's buildings.

Toronto Hydro expects that, at first instance, investments made by cleantech firms and customers facilitated by *Climate Advisory Services* will be targeted at energy

efficiency improvements and fuel-switching to electric heat pumps. This will occur across a variety of building types that may be aggregated together into larger projects to improve the underlying business case and incentivize building owners to proceed with projects that otherwise might not have been economic. This may also allow projects to meet threshold investment levels required under government programs.[144] *Climate Advisory Services* can play a central role in bringing such projects together.

By creating a customer climate action plan and connecting building owners with government climate action funding and leading cleantech providers, *Climate Advisory Services* could address several hurdles that building owners face, such as: (a) initial cost; (b) timing mismatches between the long lifespan of energy efficiency improvements and the sometimes shorter expected ownership of the property; (c) financing restrictions which prevent parties from taking on additional debt; (d) a lack of confidence that the investment will achieve energy efficiency targets and fail to provide the expected financial returns; and (e) uncertainty whether cleantech vendors are trustworthy.

This opportunity benefits from Toronto Hydro's CDM experience and reputation with a broad customer base, in that much of the CDM work was in building retrofits and other energy efficiency projects. Key components of the CDM program, such as motivating homeowners to install energy efficiency measures, involved incentives for the replacement of inefficient appliances, implementing customer enabling tools such as audits and training, and installation of demand response technologies. Toronto Hydro's work in this area was enabled by working with government in developing policies and legislation that supported the utilities' and government's CDM goals. Similar policy support will be required from governments, including the City of Toronto, to ensure that the delivery of climate action is both efficient and effective. Toronto Hydro has the experience and expertise to support the development of that policy environment.

In summary, Toronto Hydro *Climate Advisory Services* could facilitate market investments by customers and cleantech partners in delivering a building retrofits program with the following attributes, based on the projects described below.

Building Retrofits Program Potential Attributes to 2050	
Program Assets	Lease of heat pumps to residential and commercial customers and demonstration of retrofit projects
Program Costs ($M)	600
Number of Units Installed	60,000

Prospective Projects

Climate Advisory Services could support cleantech and related firms in the delivery of air source heat pump building electrification solutions to targeted residential

and commercial buildings. By tapping into customer relationships and government program support, such firms could provide heat pump leasing arrangements to customers. This program would enable fuel-switching from natural gas and other GHG-emitting sources to clean electricity across a range of building types. Though heat pump technology is mature and subsidies have been made available to customers, current rates of fuel-switching to heat pumps is not sufficient to meet net zero 2050 targets.[145] The lower cost and entrenched position of natural gas in most homes, as compared to electricity, is an important factor in slowing uptake. Leasing models would make fuel-switching more attractive by removing the need for customers to provide upfront capital and by providing hassle-free system changeout, no maintenance worries and improved occupant comfort. Potentially, when combined with envelope retrofit and conservation measures, and increasing policy-based changes on the use of GHG-emitting heating sources, cost savings for customers can also be delivered. Similarly, if appropriate government funding is available to allow scale in purchasing and leasing volume in conjunction with the strong procurement experience of Toronto Hydro, then cost savings may be passed along to customers. By focusing the program on delivering equipment performance upgrades at the time when customers' GHG-emitting heating equipment is being replaced or when key components of the building envelope are upgraded, further efficiencies can be passed along.[146]

A building retrofit program of this nature may also provide for a number of flagship demonstration building envelope and system retrofit projects. *Climate Advisory Services* is very well-positioned to support such a program by using distribution system information to identify buildings that may not only benefit from the retrofit, but which would support the grid through demand response opportunities, for example, and create cost-effective solutions that benefit ratepayers. The goal of these retrofit projects would be to provide greater visibility to the market and the public of the increased cost efficiencies and comfort, as well as reduced emissions delivered by deep retrofits. Building owners or operators may be attracted to the benefits associated with industry recognition of sustainability efforts and could also make significant gains toward their internal ESG-related targets. Depending on the financing model deployed, including potentially financing the retrofits through ongoing energy cost savings, the demonstration program may be able to shift the risk of low-carbon investment away from the building or home owner, thus increasing willingness to participate.

Social Equity Initiatives

Climate change social equity issues are particularly acute in relation to buildings. Climate change leads to more extreme temperatures and humidity, as well as damage-causing storms, all of which are the most challenging to protect against, deal with and remediate for vulnerable populations. Those with the least financial means are typically housed in buildings that are the most susceptible to these effects, aggravating other health, economic and social strains for individuals and

families. Toronto Hydro has also considered initiatives that it could facilitate with cleantech parties, funders and customers to provide low-income communities with fair and equitable access to clean energy or other supplementary social and economic benefits, which may be incorporated into a future building retrofit program.

Program	Potential Opportunity
Partnering with the City of Toronto to Demonstrate Climate Action Leadership	Climate action projects could be executed in the municipalities, universities, schools and hospitals ("MUSH") sector to show leadership by the City of Toronto while also benefitting the public
Green Choice Customer Assistance Program	Partnering with organizations such as Toronto Community Housing Corporation and the Greater Toronto Apartment Association to create a Green Choice Customer Assistance Program to provide low-cost or no-cost building retrofits and electrification solutions to benefit renters in eligible low-income MURBs

Market Economics

The City of Toronto summarized the overall economics of building retrofits and electrification as follows:

"Deep emissions retrofits at the level and scale necessary to affect market transformation do not pay back in the traditional sense and represent a net investment on the part of building owners, even based on the current planned cost of carbon. This is due largely to the scale of capital required and the very low cost of natural gas relative to electricity. Retrofit measures with a reasonable short-term payback are also likely already being undertaken by many building owners, but do not achieve the emissions savings necessary to hit the City's targets."[147]

Toronto Hydro wants to bring electrification solutions to customers to spur the reduction of building GHG emissions. Heat pump leasing and retrofit demonstrations are examples of such solutions that the market could deliver. However, the economics are tremendously challenging. Looking out to 2030, Toronto Hydro projects that a paced $215 million investment in heat pump infrastructure and related marketing, operation and other costs would generate a loss of $2.9 million over that period. Rental revenues, using rates seen as being competitive in the market to deliver uptake (but not including social equity programs), did not support costs. This was the case despite using low-cost model assumptions for the purchase of heat pumps and the price of installation/conversion from gas.

Renewable Generation and Energy Storage

There is significant work to do in the development of clean local generation sources to achieve the TransformTO core goal that, by 2050, 100% of community-wide energy will come from renewable or low-carbon sources.[148] Due to upcoming retirements and refurbishments in the nuclear sector, without the development of local renewable generation, the electricity supply for the distribution grid is projected to drop from 94% carbon-free in 2022 to approximately 81% carbon-free by 2040.[149] Additionally, the electrification goals in the transportation and buildings sectors designed to address net zero objectives will create an even greater demand on the distribution grid and, ironically, will increase the potential for larger GHG emissions relating to the grid if reliance on gas-fired generation increases. In short, Toronto is a long way from the renewable generation goals related to achieving net zero, and the market has not yet made a significant enough impact. Herein lies the opportunity for Toronto Hydro to play a leadership role in decarbonizing the local grid through *Climate Advisory Services* by facilitating the implementation of renewable generation and energy storage to help offset the need for gas-fired generation.

Toronto Hydro has a strong track record of supporting local renewable generation, including jointly investing with the City in, and designing, building and operating, solar PV projects on City-owned facilities across Toronto. In addition, the utility has enabled the growth of renewable generation in the city by providing support such as pre-assessments, connection impact assessments, and commissioning and engineering service for customer-owned and sited renewable distributed energy resources. Toronto Hydro is also involved in the design and construction of Metrolinx's Crosstown LRT battery energy storage system, Toronto Transit Commission's energy management and energy storage projects, and combined solar PV and energy storage projects at the Waterfront Neighbourhood Centre and Toronto paramedic services station EMS-46.[150]

Solar PV technology and battery storage (paired together where appropriate) are readily available and proven technologies that can be deployed in Toronto and will likely constitute the bulk of renewable climate action projects carried out by

stakeholders.[151] It is difficult for the vast majority of customers to invest in solar PV generation and storage equipment due to the large capital expense and the highly technical nature of the projects. Through *Climate Advisory Services*, Toronto Hydro can leverage its experience from the renewable projects undertaken by the utility to assist customers with their own projects, whether residential, commercial or industrial.

In summary, Toronto Hydro *Climate Advisory Services* could facilitate market investments by customers and cleantech partners in delivering renewable generation and energy storage which could have the following attributes, based on the projects described below.

Program Potential Opportunity	
Program Focus	Behind-the-meter solar PV systems and battery energy storage with customer power purchase agreements
Program Costs ($M)	2,300
Number of Units Installed (MW)	300

Prospective Projects

Climate Advisory Services could work with leading cleantech equipment suppliers and design/construction firms to help deliver behind-the-meter solar PV facilities and battery energy storage systems for City sites, commercial and industrial customers, and for public institutions such as educational facilities, cultural venues, governments and hospitals. Toronto Hydro assumes the City and its facilities would be key partners in this program as early adopters to serve as a model for property owners and, importantly, to drive scale in purchasing, which can bring prices down for all customers. In the absence of any feed in tariff-type programs from the IESO, these projects could be, for example, structured as long-term power purchase arrangements through which customers agree to take the clean electricity generated by the solar facility at a set price to offset their draw from the electricity grid. The power purchase agreements could be structured with premium pricing rates above the all-in grid price of electricity to support their economics, with the value proposition focused upon the delivery of clean, renewably sourced electricity. These projects could also complement the electricity grid by supporting local supply resiliency, including with respect to climate adaptation in the face of extreme weather events. More directly, these renewable distributed energy resources can provide power in the event that a customer loses grid electricity.[152]

Under this program, Toronto Hydro could provide its *Climate Advisory Services* to its cleantech partners and related firms in support of multiple alternative customer offerings.

Green Choice Tariff Program for Commercial and Industrial and Institutional Customers

The *Climate Advisory Services* business could support cleantech firms who would construct, own and operate behind-the-meter solar PV facilities and battery energy storage systems for commercial and industrial and institutional (MUSH) customers seeking to reduce GHG emissions. If facilitated through *Climate Advisory Services*, using distribution system information, the solar projects could be sited to maximize the GHG reduction benefits by prioritizing partnerships with customers who contribute to peak demand — i.e. the customers that drive the need for additional gas-fired generation supply. The environmental benefits of this program may also be maximized by prioritizing solar and/or storage installations for customers who are currently using behind-the-meter gas-fired generation.

Multi-Unit Residential Buildings (MURB) Solar Choice Program

Multi-unit residences make up approximately 44% of the dwellings in Toronto and are responsible for a significant proportion of the GHG emissions associated with building energy use.[153] Again, through power purchase agreements, solar projects can be installed to supply electricity to common use spaces, to serve individual apartments, or as a resource shared between multiple apartments through behind-the-meter deployment models. Access to clear roof space is a barrier to the optimization of this program, which may be overcome by developments in technology that make solar installations more flexibly located.

Grid Solar Program

Local generation could be aggregated and sold into the grid at the Hourly Ontario Electricity Price ("HOEP")[154] in accordance with the OEB's Retail Settlement Code. To the extent that the solar provides locational distribution benefits (e.g. grid flexibility services and/or other non-wires alternatives), there could be value for the regulated business in such an arrangement. In that case, it may be possible for these projects to receive a solar premium to be paid for in part or whole through distribution rates, subject to necessary regulatory approvals and an arm's length procurement process.

Social Equity Initiatives

Despite the price of PV solar falling in recent years, low- to moderate-income households are still less likely to adopt solar than higher income ones. In 2018, a study found that households that earned more than $200,000 per year were four times more likely to adopt rooftop solar than households making $50,000 or less.[155] Toronto Hydro wants to be part of the solution in addressing this inequity in the deployment of PV solar. As part of the *Climate Advisory Services* business, Toronto Hydro would work with electrification solutions firms, governments and other key stakeholders to address the social equity issue through both policy and business models. This would allow the utility to evaluate which solutions foster

the adoption among low- to moderate-income households, and devise a corresponding program to ensure that all households contribute to, and benefit from, clean local generation. Specifically, Toronto Hydro seeks to develop a customer assistance program partnering with key organizations that support low-income residents in Toronto.

Program	Potential Opportunity
Green Choice Customer Assistance Program	Partnering with organizations such as Toronto Community Housing Corporation and the Greater Toronto Apartment Association, create a Green Choice Customer Assistance Program to provide low-cost or no-cost solar installation to benefit renters in eligible low-income MURBs

Market Economics

The renewable generation initiatives described in this section would offer customers the benefit of a local clean supply of electricity without any upfront installation cost or ongoing maintenance liability. Facilitated through power purchase agreements, these projects would provide long-term stability in the price of electricity in the face of potential market volatility. Under this program model, the generation facility would be owned by the cleantech firms that work with the utility's *Climate Advisory Services*. Based on Toronto Hydro's projections, if the power purchase price matches the all-in grid price of electricity (HOEP plus the global adjustment charge), then, under each of the initiatives proposed, there would be significant annual net losses incurred by the generator. Combining storage with the PV system makes the offering even more expensive. For this reason, the ability of cleantech suppliers to charge customers a significant renewable energy premium price over the all-in grid price of electricity and tap into government support may be fundamental to the market developing in this space.

The need to address carbon emissions has become a business and operational imperative for companies and organizations in the commercial, industrial and institutional sectors. Accordingly, these customers may become interested in making low-risk and low-burden investments in clean local generation. *Climate Advisory Services* would be targeting bringing these customers together with qualified cleantech firms interested in building, owning and operating renewables. Market research indicates that these customers may be willing to pay a "renewable premium" for clean, locally sourced electricity over and above the all-in grid price. The IESO current planning outlook estimates that HOEP will more than double by 2040,[156] so, looking forward, with decline in the price of PV and storage technology, such offerings may become more competitive and more attractive for customers. Currently, Toronto Hydro projects that the renewable premium rate would need to be more than 50% higher than the all-in cost of grid electricity to be economic. Further government policies which move costs from electricity bills to the tax base may make this gap even more challenging to close.

It may be possible to reduce the price of the renewable premium that is required to make these projects economic for investors, and more attractive for customers, through the trading of renewable energy certificates or credits ("RECs") between customers as part of a voluntary market. An REC is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation.[157] An REC typically represents 1 MWh of clean electricity generated on a customer's behalf by a renewable energy facility. REC buyers are typically environmentally conscious individuals or organizations focused on reducing their GHG emissions.

To establish a viable REC platform, *Climate Advisory Services* may be able to help encourage the development of a reputable certification process to validate the RECs, as well as a platform for trading. Evolugen, a Brookfield Renewable subsidiary, is one example of a company selling RECs in Canada. The use of RECs would provide additional value for the purchaser under the renewable power purchase agreement, as they would become the owner of the REC and therefore able to offset some of the costs of the purchase by selling it in the new REC market supported by *Climate Advisory Services*. The REC platform could be used for new solar energy to begin with and, over time, can be expanded to include other producers and sources of renewable generation.[158]

Modernization of Outdoor Lighting

As set out in Part 3C, Toronto Hydro proposes a lighting conversion program to replace Toronto's traditional streetlight bulbs with modern and efficient LED bulbs, resulting in energy cost savings and emission reductions. The process of conversion could also include the installation of advanced "smart" technology that would allow for greater control and management of the streetlight network, leading to further efficiencies, safety improvements and cost savings.

Since Toronto's streetlight bulbs are owned by THESI, the project can be done under the *Climate Capital Investments* model and does not require the engagement of *Climate Advisory Services*. THESI is party to an agreement with the City of Toronto (the "Street and Expressway Lighting Agreement") which provides for annual capital and maintenance funding, and establishes service levels to be met by THESI in the provision of the streetlight services. The City of Toronto is also responsible for the electric utility costs related to the electricity used by the streetlights.

In summary, Toronto Hydro could directly undertake a lighting conversion program with the following attributes:

Streetlighting Conversion Program Potential Attributes (4-Year Conversion Term)	
Program Assets	Conversion of traditional streetlight bulbs to LED
Program Costs ($M)	180
Number of Units Installed	175,000
Sources of Investment Funding	Government Loan Programs (Canada Infrastructure Bank) Contractual arrangement with the City of Toronto

Benefits

Conversion of streetlighting bulbs to LED technology provides multiple benefits. Primarily, a conversion generates approximately 40 to 60% reduction in energy usage.[159] This reduction in energy, by extension, leads to a roughly 5 to 7% reduction in a city's GHG emissions (depending on the percentage of total energy used by the lighting system initially). Beyond the energy and emissions reductions, conversions also lead to decreased lifetime maintenance cost, as the LED bulbs have a two to three times longer lifespan compared to conventional bulbs.[160] Furthermore, improved illumination from LED streetlights contributes to public safety. For example,

in Vancouver, LED streetlights installed at 125 signal-controlled intersections are credited for reducing collisions at these intersections by 21%, and reducing traffic-related fatalities and injuries involving pedestrians by 65%.[161] If implemented, the program would be particularly focused on providing additional lighting in dark spots in more vulnerable communities.

The installation of adaptive control functionalities as part of an LED conversion project would allow for further additional benefits to a potential conversion and are included in the proposal. These include:

- Allowing streetlights to dim to match ambient light levels, providing energy savings during early evening and morning, along with the capability to dim streetlights in low-traffic areas during off-peak hours. This could potentially save an additional 10 to 15% of energy usage beyond the base retrofit savings[162]

- The ability to instantly inform operators when a light has failed, improving repair responsiveness and cost-effectiveness of maintenance programs by eliminating the need for patrols to spot issues

- Improved safety, with quicker light-out restoration, due to real-time monitoring (i.e. fewer total system "light out" hours)

- Potentially allowing for future non streetlight-related capabilities (e.g. road traffic monitoring, air quality monitoring) by connecting other devices to the streetlighting control system

Jurisdictional Context

The conversion of city streetlight bulbs to LEDs is a common conservation initiative that has already been undertaken, and in many cases completed, in a large majority of municipalities in North America, including New York,[163] Los Angeles,[164] Houston,[165] Chicago,[166] Vancouver[167] and Montreal.[168] Conversion projects have also been undertaken in major population centres in Ontario, including those directly neighbouring Toronto. As a result, equipment costs have dropped considerably over the past decade and any "new technology" growing pains have been resolved.

Toronto Hydro has already completed a number of pilots with the City of Toronto, starting with the Adaptive Lighting Asset Management Program tests in 2005. There was a subsequent test of the technology in 2015 when 200 luminaires were installed in a variety of different settings, complete with controls. Currently, there are approximately 1,400 LED luminaires installed and operational in Toronto, with little to no negative feedback from the public.

In jurisdictions that have undertaken full conversions, the most commonly cited concerns relate primarily to deviations in colour temperature, appearance and

brightness in relation to existing lighting. Replacing lighting sources on a nearly equivalent LED basis (in terms of colour temperature and brightness, etc.) would likely prove to have the highest public acceptance. The installation of smart controllers to allow for dimming would further mitigate these concerns.

Action

Toronto Hydro's research indicates that, in the last 10 years, costs (including hardware and system costs) per streetlight have decreased by approximately 50%. This provides a tremendous benefit and opportunity for municipalities that have not yet adopted LEDs, as the cost-to-savings ratio is now higher than in any prior historical period. It is also key to note that costs are not expected to materially improve in the near future.

Toronto Hydro could convert all streetlights in Toronto to LED luminaires over a four-year period, though there are a several pacing options for this project. The projected costs, which would be paid through agreement with the City, are approximately $180 million. Toronto Hydro expects that this conversion would reduce energy consumption by approximately 75,498 MWh per year, resulting in annual energy savings of approximately 60%. This equates to annual savings of $8.5 million in energy costs and $6.2 million in maintenance costs, for total annual savings of $14.7 million.

Government Support

The Canada Infrastructure Bank's Large Building Retrofits program[169] provides long-term, low-interest financing to public sector projects. This source of financing may be available to the lighting conversion program due its focus on: (1) changing out a large stock of publicly visible and inefficient infrastructure with modern energy efficient LED technology; and (2) repaying the financing through achieved energy savings. If Canada Infrastructure Bank financing can be obtained and an agreement can be reached with the City of Toronto to deploy energy savings to repay the indebtedness, Toronto Hydro projects that the loan and initial investment costs would be fully repaid before 2038.

End Notes

[1] See Appendix A for the City Council resolution.

[2] For details of climate action expressed in ways other than dollars (e.g. programs/projects, etc.), please see detailed sections for each opportunity.

[3] Scale of climate action depends on project selected and scale of that project — see Part 4 for program details and examples (electric vehicle charging, building retrofits, renewables and storage).

[4] *References re Greenhouse Gas Pollution Pricing Act* (2021), SCC 11 at para 2.

[5] Intergovernmental Panel on Climate Change, Sixth Assessment Report, *Climate Change 2021: The Physical Science Basis* (2021), available at: https://www.ipcc.ch/assessment-report/ar6/

[6] See Appendix C.

[7] Canadian Institute for Climate Choices, *Tip of the Iceberg: Navigating the Known and Unknown Costs of Climate Change for Canada* (2020), at page iii, available at: https://climatechoices.ca/reports/tip-of-the-iceberg/

[8] Government of Canada's Budget 2021 commits to provide $17.6B towards a green recovery. Details available at: https://www.canada.ca/en/department-finance/news/2021/04/budget-2021-a-healthy-environment-for-a-healthy-economy.html

The United States' Bipartisan Infrastructure Investment and Jobs Act proposes $73B (USD) for clean energy transmission; $39B (USD) to modernize public transit; $7.5B (USD) towards a national network of EV chargers. Details available at: https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/28/fact-sheet-historic-bipartisan-infrastructure-deal/

The UK's Ten Point Plan for a Green Industrial Revolution mobilizes £12 billion of government investment, and potentially three times as much from the private sector, to create and support up to 250,000 green jobs. Details available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf

The European Union has committed 30% of its €2.18 trillion 2021-2027 budget to fight climate change. Details available at: https://ec.europa.eu/info/strategy/eu-budget/long-term-eu-budget/2021-2027/whats-new_en

[9] Toronto Environmental Alliance and 23 other Toronto organizations have called for City Council to implement a "Bold, Green and Just Recovery" from COVID-19. Details available at: https://www.torontoenvironment.org/letter_to_city_council_bold_green_and_just_recovery

[10] Pembina Institute has called for government stimulus to put workers first, be based on climate principles, and result in job creation and carbon emissions reductions. Details available at: https://www.pembina.org/media-release/path-healthy-post-pandemic-economy-detailed-new-paper

David Suzuki Foundation has called for a "Green and Just Recovery." Details available at: https://davidsuzuki.org/

project/green-and-just-recovery/

[11] Ontario Energy Association has called for the energy sector to play a key role for Ontario and Canada to restore the economy. Details available at: https://energy-ontario.com/wp-content/uploads/2020/06/OEA-Submission-Ontario-Jobs-and-Recovery-Committee-FINAL.pdf

Canadian Electricity Association has advocated for economic recovery to advance Canada's transition to a low carbon economy. Details available at: https://www.ourcommons.ca/Content/Committee/432/FINA/Brief/BR10974007/br-external/CanadianElectricityAssociation-e.pdf

[12] Boston Consulting Group, *Climate Should Not be the Virus' Next Victim* (2020), available at: https://www.bcg.com/en-ca/publications/2020/coronavirus-climate-impact-green-recovery

[13] Government of Canada, Government of Canada confirms ambitious new greenhouse gas emission reduction target (2021), available at: https://www.canada.ca/en/environment-climate-change/news/2021/07/government-of-canada-confirms-ambitious-new-greenhouse-gas-emissions-reduction-target.html

[14] International Energy Agency (IEA), *Net Zero by 2050: A Roadmap for the Global Energy Sector* (2021), available at: https://www.iea.org/reports/net-zero-by-2050

[15] IEA, *Net Zero by 2050: A Roadmap for the Global Energy Sector* (2021), at page 155.

[16] City of Toronto, *Net Zero Existing Buildings Strategy: Final Report* (2021), at page 67, available at: https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168402.pdf

[17] City of Toronto, *Electric Vehicle Strategy: Supporting the City in Achieving its TransformTO Transportation Goals* (2019), available at: https://www.toronto.ca/wp-content/uploads/2020/02/8c46-City-of-Toronto-Electric-Vehicle-Strategy.pdf

[18] City of Toronto, *Electric Vehicle Strategy: Supporting the City in Achieving its TransformTO Transportation Goals* (2019), at page 4.

[19] City of Toronto, *Electric Vehicle Strategy: Supporting the City in Achieving its TransformTO Transportation Goals* (2019), at page 13.

[20] Statistics Canada, *COVID-19 in Canada: A One-Year Update on Social and Economic Impacts*, available at: https://www150.statcan.gc.ca/n1/pub/11-631-x/11-631-x2021001-eng.htm#a5

[21] Toronto Office of Recovery and Rebuild, *COVID-19: Impacts and Opportunities* (2020), at page 167, available at: https://www.toronto.ca/wp-content/uploads/2020/09/9133-torr-covid19-impacts-opportunities-2020.pdf

[22] United Nations Human Rights Office of the High Commissioner, *Understanding Human Rights and Climate Change* (2021), at page 6, available at: https://www.ohchr.org/Documents/Issues/ClimateChange/COP21.pdf

[23] City of Toronto, *Climate Resilience Framework and Recommendations Report* (2019), available at: https://www.toronto.ca/wp-content/uploads/2019/05/8ecc-CRF_Final_v3_AODA.pdf

[24] United Nations Human Rights Office of the High Commissioner, *The impacts of climate change on the effective enjoyment of human rights*, available at: https://www.ohchr.org/EN/Issues/HRAndClimateChange/Pages/AboutClimateChangeHR.aspx

[25] Willingham, L. and J. Reeves, *As Hurricane Ida hit, homeless, other vulnerable people left behind*, published by the

Associated Press on September 2, 2021, available at: https://www.theglobeandmail.com/world/article-as-hurricane-ida-hit-homeless-other-vulnerable-people-left-behind/

[26] Many communities are recognized by the City of Toronto as **equity-seeking groups**, including: Indigenous Peoples; women; immigrants and refugees; racialized communities; persons with disabilities; Lesbian, Gay, Bisexual, Trans, Queer, Two-Spirit communities; persons with low income; youth; and undocumented Torontonians. The City also recognizes the rights of other **vulnerable populations** including: seniors; victims of violence; persons with low literacy; persons who are homeless or are underhoused; and residents in Neighbourhood Improvement Areas. Details at: https://www.toronto.ca/city-government/council/2018-council-issue-notes/equity-diversity-and-inclusion-within-the-city-of-toronto/

[27] C40 Cities, *Annual Report 2020* (2020), at page 4, available at: https://c40-production-images.s3.amazonaws.com/other_uploads/images/2827_C40_Annual_Report_2020_vMay2021_lightfile.original.pdf?1622806882

[28] Miller, D. *Solved: How the World's Great Cities are Fixing the Climate* (2020).

[29] Intergovernmental Panel on Climate Change, 2021: Summary for policymakers. In: Climate Change 2021: The Physical Science Basis. Part A: The Current State of the Climate. Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

[30] C40 Cities, available at: https://www.c40.org/press_releases/global-gnd

[31] United Nations, *The Key Aspects of the Paris Agreement* (2021), available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/key-aspects-of-the-paris-agreement

[32] City of Toronto, MM10.3, *Declaring a Climate Emergency and Accelerating Toronto's Climate Action Plan*, available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.MM10.3

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[35] City of Montreal, *Transportation Electrification Strategy 2021-2023: Toward Sustainable Mobility* (2021), available at: https://montreal.ca/en/articles/transportation-electrification-strategy-2021-2023-toward-sustainable-mobility-17859

[36] City of Toronto, *Toronto Green Standard (TGS) Version 4 Adopted by Toronto City Council* (July 30, 2021), available at: https://www.toronto.ca/wp-content/uploads/2021/08/8d47-CityPlanningTGSNoticev4.pdf

[37] City of Toronto, *City Council Item IE23.1 — Net Zero Existing Building Strategy* (July 14, 2021), available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.IE23.1

[38] An Energy Performance Certificate ("EPC") rates a property in bands from A (most efficient) to G (least efficient) using the government's Standard Assessment Procedure ("SAP") which gives a numerical score of 1 to 100 SAP points. An EPC rating C equals 69 to 80 SAP points. Details available at: https://www.edfenergy.com/energy-efficiency/how-improve-your-epc-rating

[39] Mayor of London, *Zero Carbon London: A 1.5°C Compatible Plan* (2018), available at: https://www.london.gov.uk/sites/default/files/1.5_action_plan_amended.pdf

[40] Clean BC, Vancouver Heat Pump Top-Up, available at: https://betterhomesbc.ca/rebates/vancouver-municipal-heat-

pump-top-up/

[41] City of Halifax, *HalifACT: Acting on Climate Together* (2019), available at: https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM_HaliFACT_vNew%20Logo_.pdf

[42] Toronto Hydro, *2019 Environmental Performance Report* (2020), at page 12, available at: https://www.torontohydro.com/documents/20143/407273/2019-Environmental-Performance-Report.pdf

[43] In 2009, City of Toronto set a renewable energy goal of installing 550 MW of renewable generation by 2020, including 166 MW of solar PV generation. Details available at: https://www.toronto.ca/legdocs/mmis/2009/ex/bgrd/backgroundfile-24584.pdf

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[47] Association of Municipalities Ontario, *LED Streetlight Program*, available at: https://www.las.on.ca/streetlights

[48] City of Reykjavik, *Reykjavik and Climate*, available at: https://reykjavik.is/en/reykjavik-and-climate

[49] San Diego Gas & Electric, *Electric Vehicle Plans for Every Lifestyle*, available at: https://www.sdge.com/residential/pricing-plans/about-our-pricing-plans/electric-vehicle-plans

[50] City of New Orleans, *Climate Action for a Resilient New Orleans*, available at: https://nola.gov/nola/media/Climate-Action/Climate-Action-for-a-Resilient-New-Orleans.pdf

[51] City of Oslo, *Climate and Energy Strategy for Oslo* (2016), available at: https://www.klimaoslo.no/wp-content/uploads/sites/88/2018/06/Climate-and-Energy-Strategy-2016-English.pdf

[52] Energy Facts Norway, *Electricity Production*, available at: https://energifaktanorge.no/en/norsk-energiforsyning/kraftproduksjon/

[53] Balaraman, K., *California proposes 10-year transportation electrification planning process for SCE, other IOUs*, Utility Dive, published on February 11, 2020, available at: https://www.utilitydive.com/news/cpuc-10-year-transportation-electrification-planning-process/572066/

[54] Ontario Energy Board, Electric Vehicle Charging Bulletin (2016), available at: https://www.oeb.ca/oeb/_Documents/Documents/OEB_Bulletin_EV_Charging_20160707.pdf

[55] Ontario, where there were once over 300 municipally owned local distribution companies at the breakup of Ontario Hydro, now has approximately 60, many of which serve multiple municipalities (e.g. Hydro One, Alectra) or whose service territory does not extend fully to the municipal boundary line (e.g. Hydro Ottawa).

[56] City and County of San Francisco, available at: https://sfenvironment.org/climateplan

[57] Pacific Gas and Electric Company, *Fighting Climate Change*, available at: https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page

[58] See Appendix B.

[59] Environment and Climate Change Canada, *Canadian Environmental Sustainability Indicators: Greenhouse Gases* (2021), at page 11, available at: https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/ghg-emissions/2021/greenhouse-gas-emissions-en.pdf

[60] Environment and Climate Change Canada, *Canadian Environmental Sustainability Indicators: Greenhouse Gases* (2021), at page 11.

[61] Ontario Energy Association, *Net Zero by 2050* (2021), at page 8.

[62] Ontario Energy Association, *Net Zero by 2050* (2021), at page 8.

[63] Ontario Energy Association, *Net Zero by 2050* (2021), at page 8.

[64] IESO, *Yearly Energy Output by Fuel Type* (2021), available at: https://www.ieso.ca/en/Power-Data/Supply-Overview/Transmission-Connected-Generation

[65] A study commissioned by the California Energy Commission found building electrification is a lower-cost, lower-risk long-term strategy compared to renewable natural gas to achieve the state's GHG emission reduction targets. Energy and Environmental Economics Inc., *The Challenge of Retail Gas in California's Low-Carbon Future: Technology Options, Customer Costs and Public Health Benefits of Reducing Natural Gas Use* (2020), California Energy Commission. Publication Number: CEC-500-2019-055-F, at page iii, available at: https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-055-F.pdf

Similar studies in the United States suggest that even after ramping up the production of renewable natural gas, fossil fuel alternatives could supply just between 6% and 13% of current gas demand — falling short of the goal of net zero emissions. Earth Justice & Sierra Club, *Rhetoric vs. Reality: The Myth of "Renewable Natural Gas" for Building Decarbonization* (2020), at page 11, available at: https://earthjustice.org/sites/default/files/feature/2020/report-decarb/Report_Building-Decarbonization-2020.pdf

[66] Ontario Energy Association, *Net Zero by 2050* (2021), at page ii.

[67] Toronto Hydro Shareholder Direction, available at: https://www.torontohydro.com/documents/20143/411589/Shareholder-Direction-THC.pdf/4b8173bf-751e-82df-8593-90c61f33550c?t=1554134778000

[68] Toronto Hydro, *Environmental Performance*, available at: https://www.torontohydro.com/about-us/environmental-performance

[69] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 8, available at: https://www.torontohydro.com/documents/20143/15840567/2020-environmental-performance-report.pdf

[70] Toronto Hydro, *2019 Environmental Performance Report* (2020), at page 5, available at: https://www.torontohydro.com/documents/20143/407273/2019-Environmental-Performance-Report.pdf

[71] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 10, available at: https://www.torontohydro.com/documents/20143/15840567/2020-environmental-performance-report.pdf

[72] Corporate Knights, *2020 Best 50 Ranking*, available at: https://www.corporateknights.com/leadership/2020-best-50-results/

[73] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 2.

[74] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 2.

[75] Toronto Hydro, *2020 Annual Report* (2020), at page 3.

[76] City of Toronto population, available at: https://www.toronto.ca/city-government/data-research-maps/toronto-at-a-glance/

[77] Transportation is the leading cause of carbon emissions in Ontario, accountable for 35% of GHGs.

[78] Buildings are the second largest cause of carbon emissions in Ontario, accountable for 24% of GHGs.

[79] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E5.5.

[80] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E5.1, and Toronto Hydro 2019 Environmental Performance Report, at page 12.

[81] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 15.

[82] In March 2019, the Ontario Minister of Energy, Northern Development and Mines issued a directive that transferred the responsibility for designing and administering CDM programs from local distribution companies like Toronto Hydro to the IESO, although it allows for a smaller suite of local CDM programs at the IESO's discretion.

[83] Toronto Hydro, *Toronto's electricity use dropped by 2.8% during Earth Hour* (2017), available at: https://www.newswire.ca/news-releases/torontos-electricity-use-dropped-by-28-during-earth-hour-617107263.html

[84] Pembina Institute: Estimates generated based on Toronto Hydro information.

[85] Toronto Parking Authority consideration on April 6, 2021, *TPA Approval of the EV Charging Infrastructure Agreements with Toronto Hydro*, available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.PA22.3

[86] As per ChargeHub, there are 864 public chargers in Toronto, details at: https://chargehub.com/en/countries/canada/ontario/toronto.html

[87] Toronto Hydro, *2020 Environmental Performance Report* (2021), at page 16.

[88] One of the largest battery storage systems built to-date in Canada, the facility, located at Mount Dennis Station, displaces previous plans for a natural gas generator at the same site that was strongly opposed by local constituents. The battery project will store energy generated by solar PV generation onsite, as well as low-carbon electricity sourced overnight during off-peak hours. It will then supply energy the following day to reduce peak energy use, lowering the Eglinton Crosstown LRT's overall emissions and operating costs. The facility will also provide emergency power to the LRT in the event of a power interruption, providing for more resilient infrastructure while creating a better experience and an improved public safety function for transit riders.

[89] The business plan referred to here was filed with the OEB in August 2018, and is distinct from this Climate Action Plan.

[90] EB-2018-0165, Decision and Order.

[91] This non-wires alternative solution is funded through a blend of cost-effective capital and operational spending that is successfully delaying the need for much larger capital investment at that location. Demand response targets consumption at the most critical times, benefiting ratepayers through lower costs in the near- and medium-term.

[92] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E5.5.

[93] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E8.1.

[94] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E7.3.

[95] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section D2.1.2.

[96] EB-2018-0165, Distribution System Plan. Exhibit 2B, Section E5.2.

[97] UN Department of Economics and Social Affairs, *2018 Revision of the World Urbanization Prospects* (2018), at page 1, available at: https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf

[98] Green Ribbon Panel, *Clean Air, Climate Change and Practical, Innovative Solutions: Policy Enabled Competitive Advantages Tuned for Growth* (2020), at page 9, available at: http://s34294.pcdn.co/wp-content/uploads/2020/10/200062C_OverallGreenRibbonBookFINALOCT10.pdf

[99] In August 2021, the City provided Toronto Hydro with a confidential preview of some of the materials and modelling underpinning its forthcoming Net Zero Strategy.

[100] For example, on cloudy days a solar PV system may not have enough capacity to meet a household's needs and also charge a household's battery to meet evening needs. Today in Toronto, all or nearly all buildings with self-generation and storage maintain a connection to the local grid for numerous reasons.

[101] MacMillan, D. and B. Reinhard, *Louisiana power outages renew questions about utility giant's preparedness for storms*, published in the Washington Post on August 31, 2021, available at: https://www.washingtonpost.com/business/2021/08/31/ida-entergy-hurricane-louisiana-power/

[102] Plumer, B., *A Glimpse of America's Future: Climate Change Means Trouble for Power Grids*, published in the New York Times on February 16, 2021, available at: https://www.nytimes.com/2021/02/16/climate/texas-power-grid-failures.html

[103] Fant, C., B. Boehlert, K. Strzepek, et al. *Climate change impacts and costs to U.S. electricity transmission and distribution infrastructure* (2020), published in Energy 195.116899, available at: https://doi.org/10.1016/j.energy.2020.116899

[104] Canadian Institute for Climate Choices, *Canada's Net Zero Future: Finding our way in the global transition* (2021), at page 28, available at: https://climatechoices.ca/wp-content/uploads/2021/02/Canadas-Net-Zero-Future_FINAL-2.pdf

[105] IESO, *Demand Overview*, available at: https://www.ieso.ca/en/Power-Data/Demand-Overview/Historical-Demand

[106] Ontario Energy Association, *Net Zero 2050* (2021), at page 38.

[107] Ontario Energy Association, *Net Zero 2050* (2021), at page 10.

[108] The projected increases in distribution rates only include capital costs extrapolated from the City's climate modelling. The projections do not include incremental costs for distribution operations and maintenance. In addition, the projections do not consider rising costs for other parts of the electricity system, such as transmission and generation

investments that will be made to meet rising peak demand in the province of Ontario.

[109] IEA, *Net Zero by 2050* (20210), at pages 171-172.

[110] Canadian Institute for Climate Choices, *Canada's Net Zero Future: Finding our way in the global transition* (2021), at pages 37-38 and 105.

[111] Details concerning corporate finance items are set out in the Confidential Appendix H, in accordance with securities law requirements arising from Toronto Hydro Corporation's status as an offering corporation under the *Business Corporations Act* (Ontario), R.S.O. 1990, c.B.16, its status as a reporting issuer under the *Securities Act* (Ontario), R.S.O. 1990, c.S.5 and the application by the Ontario Securities Commission of National Instrument 51-102 (Continuous Disclosure Obligations).

[112] Toronto Office of Recovery and Rebuild, *COVID-19: Impacts and Opportunities* (2020).

[113] See Appendix A.

[114] Government of Canada, *Prime Minister Trudeau announces increased climate ambition* (April 22, 2021), available at: https://pm.gc.ca/en/news/news-releases/2021/04/22/prime-minister-trudeau-announces-increased-climate-ambition

[115] See Part 2, page 26.

[116] See Appendix E for meaning of "unregulated".

[117] City of Toronto, *Recommendations to Toronto Hydro on Climate Action,* City Council Decision EX22.5 (April 7, 2021), available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.EX22.5

[118] Efficiency Canada proposes the use of a similar model known as the "energiesprong model," pioneered in the Netherlands to transform building retrofits. The governance of a retrofit project under energiesprong involves a single organization taking on responsibility for the retrofit. This enables coordination of suppliers and contractors with different expertise, working as a team: Haley, B. and R. Torrie, *Canada's Climate Retrofit Mission* (2021), Ottawa: Efficiency Canada, at pages 48-57, available at: https://www.efficiencycanada.org/wp-content/uploads/2021/06/Retrofit-Mission-FINAL-2021-06-16.pdf

[119] A key difference between *Climate Advisory Services* and CDM is that market investment will drive the activity of *Climate Advisory Services* and government funding would cover the shortfall when climate action projects are not economic. CDM was primarily driven by government funding.

[120] City of Toronto, *Recommendations to Toronto Hydro on Climate Action*, City Council Decision EX22.5 (April 7, 2021), available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.EX22.5

[121] Canada Infrastructure Bank, *CIB Public Retrofits Initiative* (2021), available at: https://cib-bic.ca/wp-content/uploads/2021/05/CIB-Public-Retrofits-Initiative-Overview.pdf

[122] It is important to note that the table above makes several highly variable assumptions, such as continuing levels of government funding, economic viability of certain technology and stable energy prices, that could materially affect these projections and therefore the potential GHG reductions.

[123] EY, *The rise of ESG investing* (2021), available at: https://www.ey.com/en_ca/financial-services/the-rise-of-esg-investing

[124] Pembina Institute, *Canada's Renovation Wave* (2021), at pages 5-9, available at: https://www.pembina.org/reports/

canadas-renovation-wave.pdf; Haley B. and R. Torrie, *Canada's Climate Retrofit Mission* (2021), at pages 5-6, available at: https://www.efficiencycanada.org/wp-content/uploads/2021/06/Retrofit-Mission-FINAL-2021-06-16.pdf

[125] Gates, B., *How to Avoid a Climate Disaster* (2021), published by Penguin Random House LLC, at page 209.

[126] See Appendix E for a discussion of the unregulated business structure under which the streetlighting assets are held within the broader review of the regulated electricity distribution framework in Ontario.

[127] See Appendix E also for a discussion of the unregulated business structure used for *Climate Capital Investments*.

[128] The significant practical implications of this are discussed in Appendix E.

[129] S&P Global Ratings, Toronto Hydro Corporation. 'A' Rating Affirmed, Outlook Stable; Competitive Position Revised to Strong" (May 11, 2021), noted "the stable outlook reflects very low risk regulated electricity distribution operations and stable forecasted financial measures" (at page 1).

[130] In considering the role that Toronto Hydro's dividend can play in the establishment and sustainability of the *Climate Capital Investments*, it is also important to note how the dividend paid to the City is funded. Toronto Hydro has been undertaking massive infrastructure investment to modernize its distribution system, which is expected to further ramp up. As a result, Toronto Hydro is experiencing cash flow deficits and has been required to fund these investments through debt, despite consistently delivering positive net income results. Similarly, its dividend payments have also been paid for through indebtedness.

[131] Legal requirements relating to regulated electricity distribution companies in Ontario and their unregulated affiliates are covered in Appendix E.

[132] Canada Energy Regulator, *Market Snapshot: How much CO2 do electric vehicles, hybrids and gasoline vehicles emit?* (2018), available at: https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshot-how-much-co2-do-electric-vehicles-hybrids-gasoline-vehicles-emit.html

[133] Pembina Institute, *Taking Charge — How Ontario can create jobs and benefits in the electric vehicle economy* (2021), at page 35, available at: https://www.pembina.org/pub/taking-charge

[134] City of Toronto, *2016 Census Backgrounder, Age-Sex-Dwelling Type* (2017), available at: https://www.toronto.ca/wp-content/uploads/2017/10/96d7-2016-Census-Backgrounder-Age-Sex-Dwelling-Type.pdf

[135] On-street parking areas and nearby publicly accessible charging infrastructure.

[136] Building height (in shades of orange) overlaid with existing publicly accessible charging infrastructure.

[137] Detached, semi-detached, or row house in Toronto could qualify.

[138] The Clean Fuel Standard program is expected to come into force at the end of 2022: Government of Canada, *What is the clean fuel standard*, available at: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard/about.html

[139] This financial modelling is based on Toronto Hydro's EV pilot project experience and future-looking assumptions of capital costs, energy costs, asset utilization, expected maintenance requirements and network-related fees.

[140] For this comparison, we used as the base case a customer seeking a loan under the City of Toronto's Home Energy Loan Program for a residential EV supply equipment purchase and a typical commercial loan for a commercial

installation.

[141] City of Toronto — Infrastructure and Environment Committee, *Net Zero Existing Buildings Strategy* (2021), at page 1, available at: https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168400.pdf

[142] City of Toronto — Infrastructure and Environment Committee, *Net Zero Existing Buildings Strategy* (2021), at page 3; City of Toronto, *Net Zero Existing Buildings Strategy* (2021), available at: https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168402.pdf

[143] City of Toronto — Infrastructure and Environment Committee, *Building Net Zero Emissions City Buildings: Corporate Real Estate Management's Net Zero Carbon Plan* (2021), at page 1, available at: https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168414.pdf

[144] See Appendix F for a discussion of government support programs and electricity market revenues potentially available in the climate action program areas and the prospective projects discussed.

[145] City of Toronto, *City Council Item IE23.1 — Net Zero Existing Building Strategy* (July 14, 2021), available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.IE23.1

[146] City of Toronto, *City Council Item IE23.1 — Net Zero Existing Building Strategy* (July 14, 2021), at page 5, available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.IE23.1

[147] City of Toronto, *City Council Item IE23.1 — Net Zero Existing Building Strategy* (July 14, 2021), at page 10, available at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.IE23.1

[148] Renewable energy is understood as energy that is from a non-fossil fuel and is renewable while low-carbon energy is understood as non-fossil fuel sourced energy, including nuclear: City of Toronto, *TransformTO, Net Zero Strategy, and GHG Inventories*, available at: https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/transformto-climate-action-strategy/

[149] IESO, *Annual Planning Outlook* (2020), Figure 21, available at: https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

[150] Toronto Hydro, *2020 Toronto Hydro Environmental Performance Report* (2021), at pages 15-16.

[151] Ontario Energy Association, *Net Zero 2050* (2021), at page 41.

[152] Thayer School of Engineering at Dartmouth, *Engineering study shows renewable energy will enhance power grid's resilience*, published in ScienceDaily on May 11, 2021, available at: https://www.sciencedaily.com/releases/2021/05/210511123634.htm

[153] Statistics Canada, Census in Brief — Dwellings in Canada (2016), Table 2, available at: https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016005/98-200-x2016005-eng.cfm; Canada Green Building Council, *A Roadmap For Retrofits In Canada: Charting a path forward for large buildings* (2017), at page 7, available at: https://www.cagbc.org/cagbcdocs/advocacy/CaGBC_Roadmap_for_Retrofits_in_Canada_2017_EN_web.pdf

[154] Hourly Ontario Energy Price or "HOEP" is the wholesale electricity commodity price charged by IESO to large customers that participate in the IESO-administered market as well as local distribution companies.

[155] O'Shaughnessy, E., G. Barbose, R. Wiser, et al. *The impact of policies and business models on income equity in rooftop solar adoption* (2021), at pages 84–91, available at: https://doi.org/10.1038/s41560-020-00724-2

[156] IESO, *Annual Planning Outlook* (2020), Figure 36, available at: https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

[157] United States Environmental Protection Agency, Renewable Energy Certificates, available at: https://www.epa.gov/greenpower/renewable-energy-certificates-recs

[158] Note: RECs can be purchased from any renewable source today.

[159] Northeast Group LLC, *The Benefits of LED & Smart Street Lighting*, available at: http://www.northeast-group.com/reports/CityLab-Northeast%20Group%20-%20the-benefits-of-led-and-smart-street-lighting.pdf

https://canurb.org/publications/the-realized-results-of-led-streetlights-seizing-the-opportunity/

[160] Lightsavers Canada, *The Realized Results of LED Streetlights: Seizing the Opportunity* (2017), available at: https://saveonenergy.ca/-/media/Files/SaveOnEnergy/Industry/LightSaversLEDResults2017.ashx

[161] Chan, K., *Vancouver City Council to consider strategies to improve street lighting*, published in the Daily Hive on December 2, 2020, available at: https://dailyhive.com/vancouver/vancouver-street-lighting-improvements

[162] Canadian Urban Institute, The Realized Results of LED Streetlights: Seizing the Opportunity (January 2017), available at: https://canurb.org/publications/the-realized-results-of-led-streetlights-seizing-the-opportunity/

[163] Pereira, I., *LED streetlight conversion in NYC more than 70%*, published in amNewYork on September 26, 2017, available at: https://www.amny.com/news/led-streetlight-conversion-in-nyc-more-than-70-1-14280026/

[164] Bureau of Street Lighting, *LA Lights Strategic Plan 2020-2025*, available at: http://bsl.lacity.org/downloads/strategic_plan.pdf

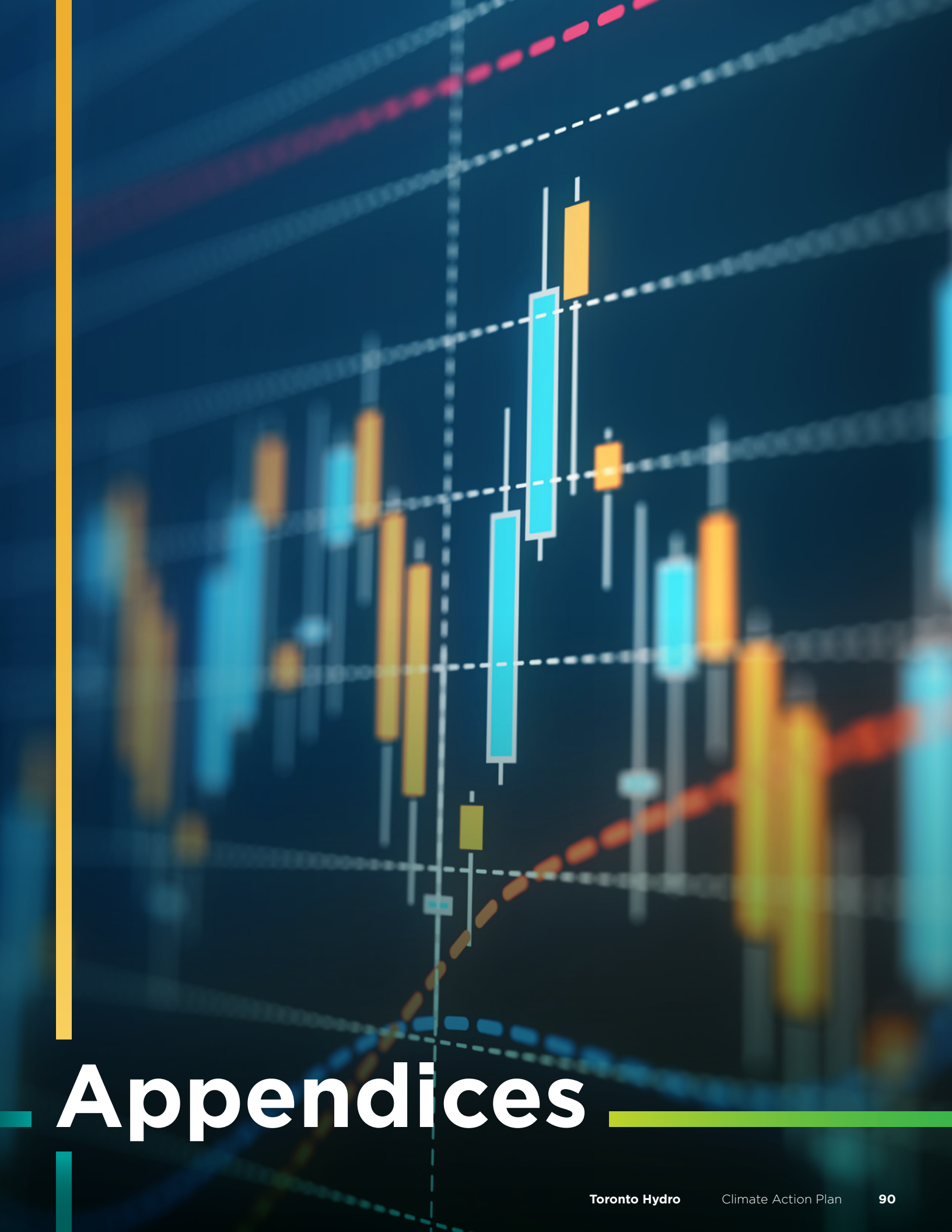
[165] CentrePoint Energy, *LED Streetlights*, available at: https://www.centerpointenergy.com/en-us/Services/Pages/LED-Streetlights.aspx?sa=ho&au=bus

[166] Chicago Smart Lighting Program, available at: https://chicagosmartlighting-chicago.opendata.arcgis.com/

[167] Chan, K., *All streetlights in Vancouver to be converted into energy-efficient white LED*, published in the Daily Hive on July 19, 2019, available at: https://dailyhive.com/vancouver/vancouver-white-led-street-light-conversion-july-19-2019

[168] Dimonoff, *City of Montreal*, available at: https://www.dimonoff.com/resources/case-studies/city-of-montreal/

[169] See Appendix F for a discussion of this and other government support programs which may be applicable to the program areas.



Appendices

Appendix A: Council Request for the Climate Action Plan

"We have joined cities around the world in declaring a global climate emergency and committing to take further action to tackle climate change. The threat of climate change is a major issue facing our city, and all cities. The declaration approved by Council today lays out what I believe are ambitious but realistic new targets to help focus our efforts when it comes to reducing Toronto's greenhouse gasses as quickly as possible."[1] — Mayor John Tory

On October 2, 2019, Toronto City Council declared a climate emergency "for the purpose of naming, framing, and deepening our commitment to protecting our economy, our ecosystems and our community from climate change."[2] To date, over 500 municipalities across Canada have declared a climate emergency.[3] This action linked Toronto with other C40 cities establishing the 1.5°C goal of the Paris Agreement as the reference point for climate change policy outcomes.[4] As a result, a greenhouse gas ("GHG") emissions reduction target of becoming net zero by 2050 was entrenched as City policy,[5] confirming City Council's ambitions for emissions reductions that went beyond the low-carbon targets of TransformTO.[6] Furthermore, City staff were instructed to investigate the feasibility of actions that could accelerate the attainment of net zero by 2040.[7] The motion, moved by Mayor John Tory, received unanimous consent from City Council.[8]

This action came two years after City Council's unanimous approval of TransformTO (Report #2), the City's flagship climate change initiative that includes strategies to reduce local GHG emissions to improve health, economic prosperity and social equity.[9] TransformTO directed City staff to take a number of actions in pursuit of long-term goals identified in the report:[10]

- **GHG emissions**: Relative to 1990 targets, a 30% reduction by 2020 and 65% by 2030[11]

- **Waste**: 95% of waste diverted in all sectors by 2050

- **Transportation**: 100% of transportation options use low or zero-carbon energy sources, with active transportation accounting for 75% of trips under 5 kilometres by 2050

- **Buildings**: 100% of new buildings are designed and built to be near-zero GHG emissions by 2030, and 100% of existing buildings are retrofitted to the highest emission reduction technically feasible by 2050

- **Energy systems**: 75% of community-wide energy use is derived from renewable or low-carbon sources, with 30% of total residential and commercial floor space connected to low-carbon thermal energy by 2050

The City is making progress towards these objectives. In its June 2020 Update, the City staff reported that community-wide GHG emissions in 2017 were 44% lower than the 1990 baseline, exceeding the 2020 short-term target.[12] The update reported on 13 other measures that track progress against TransformTO goals for waste, energy, transportation and buildings.

The pursuit of TransformTO objectives encompasses and shapes other policy measures approved by City Council. In early 2020, City Council approved a comprehensive EV Strategy, an initiative in which Toronto Hydro actively contributed.[13] In July 2021, City Council approved a Net Zero Existing Buildings Strategy and changes to the Toronto Green Standard in further pursuit of emissions reduction objectives.[14, 15]

Less than six months following the City's climate emergency declaration, Toronto and the rest of the world found itself in the midst of a global pandemic that created immediate and extensive pressures on Toronto's public and fiscal health.[16] The City established the Toronto Office of Recovery and Rebuild ("TORR") to develop "recommendations [that] are actionable and implementable by the City of Toronto and its agencies and corporations to support the recovery and rebuild of our communities, organizations, partners and businesses."[17]

The Final Report of the TORR ("TORR Report") was delivered to City Council in October 2020 and was approved, with amendments. The TORR Report identified that "many impacts of COVID-19 were disproportionately felt by some neighbourhoods, segments of the population, occupations and sectors — a reality that must be addressed in recovery."[18] Climate change featured prominently in the TORR Report, with parallels drawn between the immediate impacts of COVID-19 and the longer-term effects of climate change. "A resilient city is better able to adapt to near- and long-term impacts of climate change and other natural events, such as a pandemic, that can disrupt City operations, impact peoples' lives and have a negative effect on the economy."[19]

Through its recommendations, the TORR called on the City to "Build Back Better." "Toronto should continue to address climate change and improve the resilience through its recovery and long-term rebuild efforts to ensure the momentum and ground gained through past strategies are not lost."[20] One of the 83 recommendations encouraged the City and Toronto Hydro to work collaboratively on electrification and energy efficiency. The City Manager's analysis confirmed the imperative role Toronto Hydro plays in the attainment of net zero objectives and green recovery more broadly, noting a number of partnerships already underway in advancement of that objective.[21]

In approving the item, City Council directed the City Manager to develop recommendations for Toronto Hydro on what more it could do.[22] In March 2021, the City Manager returned to the Executive Committee and then City Council with his Recommendations for Toronto Hydro on Climate Action.[23] The City Manager focused attention on four areas specifically:

- Electric vehicle charging infrastructure
- Outdoor lighting, including streetlighting
- Renewable energy and energy storage
- Attracting revenue through non-rate sources

City Council adopted the item, requesting Toronto Hydro report back to the City Manager by the end of the third quarter of 2021 on current work and an action plan, including opportunities for acceleration, investments, reporting and collaboration with City divisions and agencies to achieve outcomes in the areas noted above. City Council further requested that the City Manager consult with Toronto Hydro and relevant divisions and agencies with respect to Toronto Hydro's role in achieving the City's climate change and equity objectives through electrifications, conservation, energy efficiency, demand management, renewable energy and other mechanisms, and to report back by the fourth quarter of 2021. Finally, City Council directed the City Manager to report back to City Council on both matters by the end of the fourth quarter of 2021 and any recommendations regarding Toronto Hydro's shareholder direction that result.

Appendix B: Climate Action Plan Development and Acknowledgements

In developing the Climate Action Plan, Toronto Hydro received and benefitted from the advice of many public and non-profit stakeholders. Within the time available, Toronto Hydro actively sought out ideas, information and analysis from some of those engaged in climate action in Toronto. Their perspectives were instrumental in guiding the direction of this report. Many of these organizations and the individuals working at them are long-time champions of combatting climate change. Some provided local perspectives, as well as expertise with respect to specific technologies. Others provided Canada-wide and international perspectives and expertise on the broader challenges and opportunities associated with climate change and climate action.

While Toronto Hydro is an expert in energy infrastructure and related services, and has a strong record of environmental performance, it recognizes that climate change is a complex and evolving issue and approached these stakeholders with an openness to learn from others. A sophisticated Climate Action Plan that can produce meaningful results in a timely manner while concurrently advancing the economic and other corporate imperatives of a for-profit City-owned business, is necessarily one that is infused with the insights of a broad range of knowledgeable stakeholders.

Toronto Hydro benefitted tremendously from contributions by staff at the City of Toronto and, in particular, the Environment and Energy Division ("EED"). Toronto Hydro and the EED collaborated closely, recognizing that the Climate Action Plan is an important opportunity to accelerate the net zero objectives set out in the climate emergency declaration and broader objectives found within TransformTO.[24] During the preparation of the Climate Action Plan, EED was in the process of developing the City's Net Zero Strategy, due to City Council in late 2021. Both Toronto Hydro and EED worked hard to facilitate alignment between the Climate Action Plan and

the Net Zero Strategy. At the same time, both groups recognized that as important as both documents are, it is the ongoing collaboration with each other, other City-affiliated groups and other stakeholders that will be essential. Among City-affiliated groups, Toronto Hydro also benefitted from the contributions of The Toronto Atmospheric Fund, Transportation Services and Toronto Parking Authority, among others. Ongoing collaboration with these groups will be critical to achieving the shared objective of mitigating climate change.

Toronto Hydro also engaged the federal government and provincial government. Government support for efforts to reduce GHG emissions is essential. Natural Resources Canada, in particular, was very helpful in explaining how Toronto Hydro can help connect homeowners and businesses to available funding opportunities, as well as to companies that provide the products those customers require. Both the federal and provincial levels of government expressed interest in continuing to work with Toronto Hydro on issues of climate and related policy, pending Toronto Hydro receiving a climate action mandate from Toronto City Council.

Toronto Hydro leveraged what it heard previously from customers through many rounds and means of engagement that inform its approach to business planning and investment priorities. Over 10,000 customers provided project-specific feedback to Toronto Hydro during its most recent rate application process. These insights remain critical as Toronto Hydro looks ahead to reconcile the need for significant investments in climate action with impacts on rates that are in line with a public interest mandate.

Toronto Hydro received helpful insights from the Toronto Region Board of Trade ("TRBOT") — specifically, feedback on how various climate action approaches would affect its members in the cleantech sector and beyond. TRBOT's perspective was especially important in the context of the City's recovery and rebuild initiative, and the central role that the business community plays in getting people back to work and the city back to the vibrant hub that is so important to its residents, visitors, business owners and the Canadian economy.

Toronto Hydro also recognizes the exceptional insights, advice and other contributions from its professional advisors. The climate action expertise of the Pembina Institute was invaluable in shaping Toronto Hydro's understanding of barriers, opportunities to overcome those barriers, and best practices in that regard across Canada and beyond. The financial expertise and broader advisory expertise of Grant Thornton was critical to ensure that the *Climate Advisory Services* and *Climate Capital Investments* opportunities received a thorough examination on their merits. Energy-specific expertise at it overlaps with climate action was furnished by a number of firms, including Aird & Berlis LLP, Dentons LLP, Power Advisory LLC, Sussex Strategy Group and Torys LLP.

Appendix C: Climate Change and Energy

Overview

It is unequivocal that human interference is warming the atmosphere, ocean, and land at a rate that is unprecedented, in at least the last 2,000 years.[25] Entire ecosystems face extinction. Extreme weather events occur more frequently. Biodiversity and economic prosperity are at risk at a global level, the consequence of which will be disproportionately concentrated on certain peoples and in certain places.

According to the Canadian Institute of Climate Choices, over the past five decades the cost of weather-related disasters like floods, storms and wildfires rose from tens of millions of dollars to billions of dollars annually. Insured losses for catastrophic weather events totaled over $18 billion between 2010 and 2019, and the number of catastrophic events was over three times higher than in the 1980s.[26] As the Supreme Court of Canada's 2021 majority decision affirming the federal government's national minimum 'backstop' price on greenhouse gas "GHG" emissions stated: "Climate change is real. It is caused by greenhouse gas emissions resulting from human activities, and it poses a grave threat to humanity's future. The only way to address the threat of climate change is to reduce greenhouse gas emissions."[27]

The extent to which climate change will change our ways of living, mitigating and adapting to the effects of climate change, and through proactive adaptation and mitigation measures, is difficult to overstate. It is only through deep reductions in GHG emissions that the worst effects of climate change can be prevented.

Climate Change Trends and Issues

International Efforts

The United Nations leads a coordinated international effort to curb global emissions. On December 12, 2015, 197 countries concluded negotiations of the historic Paris Agreement at the 21st Conference of the Parties to combat climate change and accelerate the necessary development towards a low-carbon future.[28] The Paris Agreement strengthens the global response to climate change and global warming by promoting sustainable development with signatories agreeing to limit the global

temperature increase to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C.[29]

The Paris Agreement operates according to the principle embedded in the United Nations Framework Convention on Climate Change: that countries should protect the climate system "for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities."[30] Through Nationally Determined Contributions ("NDCs"), parties to the Paris Agreement must undertake and communicate ambitious efforts that contribute to the achievement of the temperature goals set out in Article 2.

Based on Parties' previous NDCs, the United Nations Framework Convention on Climate Change projects that total GHG emission levels resulting from the implementation of NDCs will be around 14.04 Gt CO_2 eq in 2025 (2.0% higher than 1990 levels) and around 13.67 Gt CO_2 eq in 2030 (0.7% lower).[31, 32, 33] This falls short of the goals of the Paris Agreement. To limit the increase of rise in temperature to 1.5°C, global anthropogenic CO_2 must be lowered by 45% by 2030.[34] Reductions in non-CO_2 emissions are also needed.

The international community is developing national pathways to achieving emissions reduction goals. The European Union and its 27 member states target GHG reductions of at least 55% by 2030 compared to 1990 levels.[35] Since 2014, the European Union reduced its emissions by 26% from 1990 levels and has grown its Gross Domestic Product ("GDP") by more than 64% over that same period.[36] The United Kingdom committed to reduce GHG emissions by at least 68% of 1990 levels by 2030. It established economy-wide emission reduction goals and implemented numerous relevant policies and measures at the national, sub-national, and local levels that also support nature-based solutions, managing floods and undoing coastal erosion.[37, 38] The United Kingdom legislated its net-zero-by-2050 commitment through amendment to its 2008 *Climate Change Act*.

The United States recently recommitted to the Paris Agreement in 2021. At the Leaders Summit on Climate, hosted by President Biden and understood as a stepping stone to the upcoming United Nations climate change conference, the United States announced an increased target of 50 to 52% below 2005 levels by 2030.[39] The United States expects to achieve reductions by increasing funding opportunities to support the development and deployment of non-emitting electricity systems, cutting-edge transportation technologies to encourage active transportation, reforestation initiatives to alleviate the effects of mass wildfires, and retrofit programs for the building sector.[40] At the same event, Japan announced a new GHG target of 46% by 2030 (relative to 2013 levels). Japan's strategy advances artificial photosynthesis and comprehensive carbon capture, utilization and storage strategies.[41]

Federal Policy

Canada originally pledged to reduce its GHG emissions by 30% below 2005 levels by 2030 when it signed the Paris Agreement, and recently raised its emissions reduction pledge to 40 to 45% below 2005 levels by 2030.[42, 43, 44] Canada implemented a strengthened climate plan to ensure it exceeds its original 2030 emissions reduction goal and targeting achieving net zero by 2050.

Canada's climate plan contains three main pillars: (1) The Pan-Canadian Framework on Clean Growth and Climate Change; (2) A Healthy Environment and a Healthy Economy; and (3) *The Canadian Net-Zero Emissions Accountability Act*. This framework forms the foundation for Canada's efforts on clean growth and climate change-related initiatives, among them:

- Applying a predictable and gradually rising consumer carbon tax on Canadian households
- Instituting an output-based, federal carbon pricing system on Canadian industries
- Appointing a Net Zero Advisory Body of independent experts to use existing and emerging research and analysis to report regularly to the Minister of Environment and Climate Change and to the public on the best pathways for Canada to achieve net zero emissions by 2050[45]
- Initiating the Net Zero Challenge, a funding program for large emitters to support Canadian industries in developing and implementing plans to transition their facilities to net zero by 2050
- Formalizing Canada's target to achieve net zero emissions by the year 2050 inclusive of a process to establish a series of interim emissions reduction targets at five-year milestones from 2030 to 2050[46]

Since negotiating and signing the Framework in 2016, the Government of Canada has committed over $60 billion to reduce GHG emissions, generate clean technologies, help Canadians and communities adapt to a changing climate, and protect the environment.[47] The "Healthy Environment and Health Economy Plan" committed an additional $15 billion to implement 64 measures combatting climate change, including enhanced carbon pricing measures, investments in low-carbon and energy-efficient infrastructure, and investments in low and zero-emission vehicles ("ZEV").[48]

Made-in-Ontario Environment Plan

In 2018, the Government of Ontario unveiled its Made-in-Ontario Environment Plan ("Plan") to address climate change. The Plan is comprised of four main components: (1) addressing climate change; (2) protecting Ontario's air and water; (3) reducing

waste and litter; and (4) conserving land and greenspace.[49] The Made-in-Ontario Environment Plan aligns Ontario's GHG emission reduction target with Canada's original target under the Paris Agreement of 30% below 2005 levels by 2030. To meet this target, emission reductions already achieved by the electricity sector since 2005, in closing coal-fired electricity generation, are accounted for and relied upon.[50] Additional reductions are expected to be achieved through the pricing of carbon for heavy emitters, achieving results through an emission reductions fund and implementing a reverse auction to encourage private investment in clean technology solutions.[51, 52] However, provincial direction deviated in many ways from inherited policy, including on cap-and-trade and government incentives to increase adoption of ZEV vehicles. New policy direction also cancelled investments in renewable generation projects.

Energy Production and Its Role in Climate Change

The energy sector is the source of approximately three-quarters of the world's GHG emissions.[53] According to the International Energy Association ("IEA"), decarbonizing the global energy sector will be key to averting the worst effects of climate change through transforming how energy is produced, transported and consumed. In its 2021 flagship report detailing a global pathway to net zero by 2050, the IEA calls for more ambitious climate commitments from governments across the globe, and the deployment at a global scale of all available clean and efficient energy technologies.[54] The IEA's pathway to reaching net zero by 2050 includes the following milestones: no new sales of fossil fuel boilers by 2025; all new buildings are zero-carbon-ready by 2030; 50% of existing buildings are retrofitted to zero-carbon-ready levels by 2040; 50% of heating demand met by heat pumps by 2045; no new internal combustion engine vehicle sales by 2035; overall net zero emissions electricity in advanced economies by 2035; and no new oil and gas fields approved for development as of 2021.[55]

As the world's sixth-largest producer of natural gas and fourth-largest producer of oil, Canadian oil and natural gas contributed over $105 billion to Canada's GDP in 2020 and supported more than 500,000 jobs across the country.[56] The majority of Canadians depend on fossil fuels to heat their homes, run their vehicles, fuel many of their district energy systems and, in some provinces, power their lights. While energy generated from burning fossil fuels shaped and revolutionized the world that exists today, the continued reliance on fossil fuel energies undermines Canada's long-term economic competitiveness and Canadians' well-being and prosperity along with climate and ecological stability. In 2019, Canada's energy sector contributed 81% of total national GHG emissions.[57] A net zero future must transition to clean fuels across the fullest possible range of applications — buildings, transportation and energy systems — accompanied by an increase in energy efficiency. Although Canada elevated its targets to reduce GHG emissions by 40 to 45% below 2005 levels by 2030, its climate goals are significantly lower than the United Kingdom and member states of the European Union that benchmark GHG reduction targets

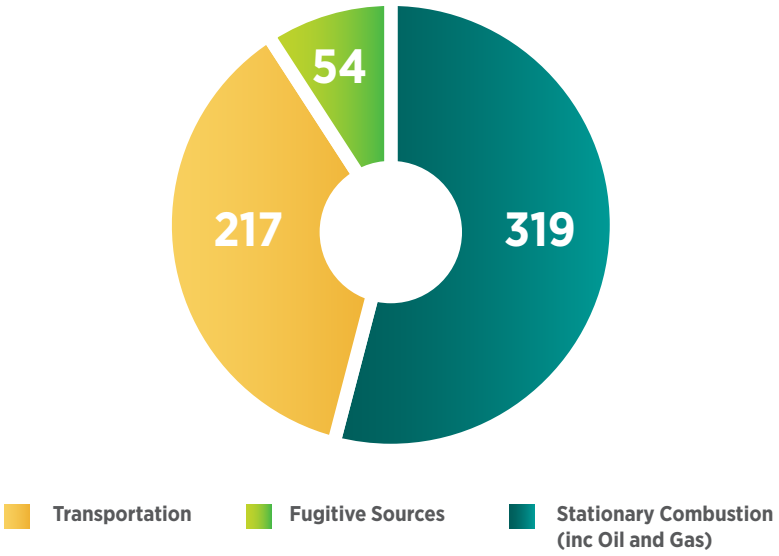
against 1990 emissions. With Australia, Luxembourg and the United States, Canada ranks among the world's top GHG-intensive economies by GDP and most intensive on a per capita basis.[58]

Nevertheless, progress is being made. GHG emissions dropped in many sectors since 2005, most notably in electricity generation where emissions decreased by 45%.[59] This compares favourably to emissions from oil and gas and transportation, which increased by 67% and 18% respectively over the same period. Canada's total GHG emissions for 2019 equaled 730 Mt CO_2e, a 1.1% decrease from 2005 emissions.[60] For Canada to achieve its 2030 targets, greater reductions must be realized at a quicker pace. Fortunately, existing technologies are sufficient to achieve the necessary cuts in global emissions by 2030, and a suite of proven policies are available to decision-makers, if properly implemented.[61]

Energy Sector Emissions

The Canadian energy sector accounted for 589 Mt CO_2e of its total GHG emissions in 2019 sources:[62] Stationary combustion (54%) includes oil and gas extraction; public electricity and heat production; petroleum refining; manufacturing and mining industries; residential, commercial, and institutional combustion sources; and the agriculture and forestry sectors. Of all stationary combustion emissions, oil and gas extraction and public electricity and heat production contributed to approximately one-third and one-fifth of 2019 emissions, respectively.[63] Transportation (37%) includes fuel combustion for road transportation, aviation, marine, railways, off-road transportation and pipeline transport.[64] Personal light-duty gasoline vehicles and trucks accounted for more than a third of these emissions.[65] Fugitive sources (54 Mt CO_2e, 9%) includes intentional and unintentional releases of GHGs from the production, processing, transmission, storage and delivery of fossil fuels.[66] CO_2 transport and storage (<1%, not included in chart below) includes capture, transport and long-term geographical storage of CO_2.[67]

Canadian Energy Sector Emissions in Mt CO_2e, by Source (2019)



Despite the national energy sector's GHG emissions footprint, some significant progress was made. Between 1990 and 2019, emissions from electricity and heat production *decreased*. Despite the increased demand for electricity over that period (34%), sector GHG emissions actually dropped by 26 Mt CO_2e, or 27%.[68, 69] Ontario's displacement of coal-fired power with non-emitting sources of generation (such as hydro, nuclear and other renewables) was the principal driver of this decoupling of emissions and consumption.[70]

Towards a Cleaner Future

In 2017, the Generation Energy Council ("GEC"), a federal body convened by Natural Resources Canada ("NRCan") and comprised of 14 environmental professionals and leaders from across Canada, developed a report that outlined pathways that could lead Canada to an affordable and sustainable energy future within the next generation. The GEC identified four main pillars that would collectively lead to a more sustainable energy future: (1) wasting less energy by improving energy efficiency; (2) switching to clean power by relying more on electricity for its energy needs; (3) using more renewable fuels; and (4) producing cleaner oil and gas.[71] The GEC noted that bringing more non-emitting electricity sources online must not sacrifice grid stability or affordability.[72] Providing consumers, institutions and businesses more opportunities to choose clean electricity for areas such as transportation and heating was also recommended.[73] The GEC outlined four pathways for implementation:[74]

Regulations: Well-thought out codes and standards, synchronized at every level of government, can make more energy efficient business decisions the obvious choice.

Investment: Conservation-focused financing, incentives, and other fiscal tools can help encourage more energy efficient decisions.

Procurement: By treating energy as a valuable and profitable commodity, that has the potential to be purchased from homeowners and businesses, the government as purchaser can help blaze the trail for more efficient energy use.

Infrastructure: Since much of Canada's energy use is dictated by the current infrastructure, more energy-efficient planning for future development and retrofits can go a long way.

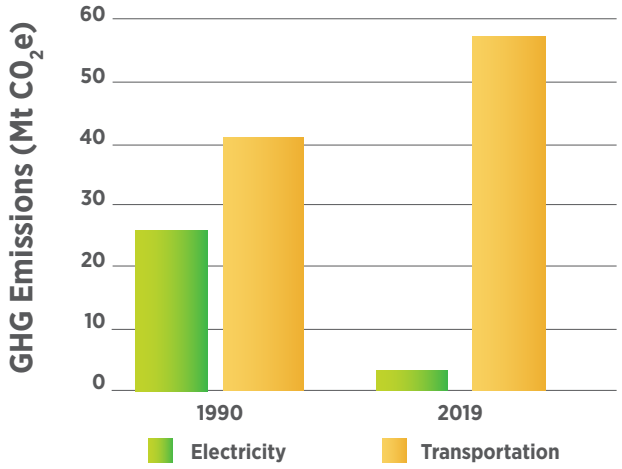
The Opportunity for Provincial Electricity Systems

Ontario electricity emission levels now compare favourably to Alberta, Saskatchewan, New Brunswick and Nova Scotia — which all still rely heavily on burning fossil fuels for electricity generation.[75] Ontario is well-positioned to further decarbonize energy in Ontario by leveraging its relatively clean electricity grid to help other segments

of the economy reduce emissions through enhanced electrification.

Currently, 48% of Ontario's energy use comes from refined petroleum products primarily for transportation; 28% from natural gas to heat homes, businesses and industry; 16% from electricity; 4% from biofuels; and the remaining 4% from other fossil fuels.[76] However, because of decarbonization efforts, Ontario's electricity sector accounts for only 2% of the province's economy-wide GHG emissions as opposed to 82% from the transportation, industry and buildings sectors.

Ontario Electricity and Transportation Emissions



Source: Ontario Energy Association.[77]

Challenges do remain. With the retirement of Pickering Nuclear Generating Station in the mid-2020s, the Independent Electricity System Operator ("IESO") expects GHG emissions from electricity to rise over the coming decade due to an increased reliance on natural gas-fired generation.[78] And, as neither the Ontario Energy Board ("OEB") nor the IESO have an explicit legislative mandate to prioritize climate change mitigation, securing investments needed to attain net zero targets will require concerted policy partnership between government, regulators and industry.

Additionally, policy constructs still under development is creating investor and regulatory uncertainty for many innovative technologies, including distributed energy resources. Both the OEB and IESO have shown a preference towards non-utility distributed energy resources solutions. The lack of regulatory certainty is suboptimal for proponents and investors, and limits how utilities can leverage non-wires alternatives in a cost-effective and reliable manner.

Ontario's electricity grid is the best option for fuel-switching to achieve a net zero future. While fossil fuel alternatives like renewable natural gas have the potential to produce clean energy, they are unlikely to be produced at a scale to meet current demand. A study commissioned by the California Energy Commission found building electrification is a lower-cost, lower-risk long-term strategy compared to renewable natural gas[79] to achieve the state's GHG emission reduction targets.[80] Similar studies in the United States suggest that, even after ramping up the production of

renewable natural gas, fossil fuel alternatives could supply just between 6% to 13% of current gas demand — falling short of the goal of net zero emissions.[81]

Powering the Clean Energy Economy

Investment in climate action leads to jobs and economic growth. The federal government's most recent climate plan, "A Healthy Environment and a Healthy Economy," includes large investments in building envelope improvements and heat pumps, clean electricity generation and zero-emission transportation.[82] A recent assessment of potential economic growth from Canada's climate plan found that, by 2030, the number of jobs in clean energy is expected to grow almost 50% to 639,200 and the sector's GDP is forecast to grow by 58% in the same timeframe.[83] One key area of job growth is in ZEV technology. Jobs are on-track to grow 39% per year with 184,000 people set to be employed in that sector by 2030. Ontario is projected to see an increase of more than 220,000 jobs in clean energy industries, up 43% over 2020.

The strength of investment in climate action is not just the number of jobs created, but the quality of those jobs. Workers in the clean energy sector generally have higher-than-average wages. According to data from the United States, jobs in hydropower pay 41% more than the median wage while jobs in wind and solar offer 37% and 28% more, respectively.[84]

Appendix D: Utility of the Future

Strategic Priorities

For over 100 years, Toronto Hydro has been the local electric company that's owned and maintained a physical grid of poles and wires requiring a lot of manual intervention. While it will continue to be a utility that serves its customers and keeps the lights on, the way it does that is evolving markedly. Toronto Hydro's exciting transformation into a utility of the future is anchored by six strategic priorities.

Intelligent grid

The foundation for Toronto Hydro's future — the intelligent grid — involves two key areas of focus:

1. The automation of grid investments to propel Toronto Hydro into the future and make it a more effective and efficient core utility.

These types of investments move the utility closer to an artificially intelligent system that detects and self-heals before problems occur. By integrating a network of sensors and two-way interactive capabilities throughout the city's electrical grid, Toronto Hydro will be able to quickly isolate, identify and resolve issues with far less manual intervention and control.

Toronto Hydro has already made important strides in building the intelligent grid. As part of the modernization of the distribution system and developing a self-healing grid, Toronto Hydro has been installing monitoring sensors and operationalizing supervisory control and data acquisition (SCADA) architecture at automated and remote-controlled sites. Toronto Hydro has also received regulator approval to build a back-up control room, which is a key foundation for the future energy centre — the central nervous system of the grid.

2. Market-enabling investments that get the utility ready for a range of possible futures where that core utility function evolves away.

The intelligent grid paves the way to develop the central nervous system of the interconnected electricity grid, opening up new capabilities to monitor and shape demands on the system, procure and dispatch resources, and integrate distributed (clean) energy resources. As these capabilities accumulate and evolve in the long-term, they'll enable Toronto Hydro to take on the role of a system operator rather than simply a service provider.

Energy storage

Over time, energy storage will evolve to become an important part of the toolkit to help utilities and customers manage an increasingly dynamic electricity supply/demand environment. Energy storage offers a unique opportunity to address grid-side capacity needs through tools like demand response, as well as commercial and industrial customer-side needs such as power quality improvements. As costs come down and the economics evolve (e.g., value-stacking), energy storage will likely evolve to be a key non-wires alternative technology that will assist the utility and its customers in realizing the intelligent grid both in front of and behind the meter.

Toronto Hydro has been making significant progress in the space of non-wires alternatives and energy storage, which pave the way for the intelligent grid. It won ground-breaking regulator approval for local demand-response and built the proof-of-concept project. It also supplied battery storage to provide back-up supply for a large transit project, and successfully advocated for a new model in which utilities may be allowed to rate-base future storage projects behind customers' meters where certain criteria are met.

Transportation electrification

As personal, fleet and public vehicles become increasingly electric, utilities have an important role to play as partners and enablers of this future.

As Toronto continues to grow at a record rate, numerous public transit upgrades and expansion projects are underway to serve an increasing, and increasingly dense, population. Toronto Hydro is already a key partner in the delivery of these projects, ensuring the flow of safe and reliable electricity as well as behind-the-meter services such as storage and bus fleet charging.

Personal and private fleet electric vehicles (EVs) also present potential for new revenue streams — for example, through new rates classes, metering, and leveraging Toronto Hydro's streetlighting assets and the opportunities of vehicle-to-grid electricity as part of demand-management and non-wires-alternatives.

Toronto Hydro has become increasingly engaged in transportation electrification. It recently won a partnership with Metrolinx to help reduce emissions on the Eglinton Crosstown Light Rail Transit (LRT) line through a battery energy storage system, and is running several pilots to provide charging services to the Toronto Transit Commission (TTC) fleet, Toronto Parking Authority and personal on-street residential charging. Pilots like these will help Toronto Hydro better understand the market for public EV charging, as well as the impact EVs will have on the distribution system and opportunities they present for the intelligent grid.

Customer experience

As the landscape is shifting, the utility role in responding to customer needs and expectations must adapt.

The second foundation for Toronto Hydro's future — the customer experience — moves the utility closer to an omni-channel view of the customer, meeting them where they are and helping them shape where they want to go with their utility service model.

The first tier of this customer experience evolution is focused on a combination of two-way communication tools through digital platforms, and enhanced research and engagement tools for mass market customers. The second tier is focused on leveraging the key account framework and deploying enhanced bespoke services to serve the unique needs of large commercial and industrial customers.

Toronto Hydro has begun taking exciting steps in customer experience, including through working directly with customers to successfully launch pilot "pizza tracker" capabilities on its interactive outage map, which enable customers to track outage restoration progress in real time in a form similar to the food delivery apps they're familiar with. It's also implementing a suite of innovations to enable customers to communicate directly with the utility for a host of customer service needs, including through a live chat function on its website.

Process automation

Extending technologies to augment efficiencies and integrate new capabilities makes good sense for any business. As Toronto Hydro looks to maximize the benefits of its digitally enhanced grid, process automation will play a key role in enabling it to continue improving its productivity. Advancements in automation, including machine vision, machine learning, blockchain technology, connected devices (i.e., the Internet of Things), robotics and drones show substantial promise to simultaneously enhance automation, reliability, productivity and cost-control. By investing in and leveraging these automation technologies, Toronto Hydro has the opportunity to realize economic benefits and improve the customer experience.

Business growth

In 2020, Toronto Hydro distributed 24 TWh of electricity to approximately 784,000 customers, and the major development trend in the city continues as high voltage connection requests for Toronto Hydro grew by almost 30% between 2018 and 2019.[85] Toronto's ongoing and exponential growth supports continued investment in core utility operations. As Toronto Hydro continues to evolve, finding ways to effectively leverage this expansion to stimulate business growth in the form of new customers, buildings and infrastructure becomes increasingly important.

Appendix E: Regulatory Framework for Prospective New Business

Overview

Toronto Hydro Corporation's ("THC") mandate is set by the City in its capacity as sole shareholder within the parameters of governing provincial legislation,[86] as well as the rules and guidelines set out by regulators. THC currently fulfills its mandate through two subsidiary operating companies: the regulated licensed distributor Toronto-Hydro Electric-System Limited ("THESL") and the streetlighting company Toronto Hydro Energy Services Inc. ("THESI") (these three companies are collectively referred to as "Toronto Hydro").

Toronto Hydro operates within the highly regulated provincial energy framework, the primary purpose of which is ensuring access to safe, reliable and affordable service for customers. Under this framework, the business activities of the licensed distributor THESL are restricted, its interactions with affiliated subsidiary companies are closely controlled, and only the costs of distribution activities may be funded through rates charged to its customers as approved by the Ontario Energy Board ("OEB").

Even within this highly regulated framework, Toronto Hydro can take meaningful climate action through its distribution business and through the creation of new business models — *Climate Advisory Services* and *Climate Capital Investments*. This Appendix describes how these three levels of climate action can be structured to ensure compliance with the existing regulatory framework.

Regulated Distribution Business

Toronto Hydro was re-established as a corporation in 1999 as a result of the restructuring and deregulation of Ontario's electricity industry pursuant to the *Electricity Act, 1998*. Under the *Electricity Act, 1998*,[87] municipalities that owned distribution assets, whether they distributed power directly or through a utility commission like the Toronto Hydro-Electric Commission, were required to establish a separate local distribution corporation with the municipality as the shareholder.

At the time of restructuring the electricity industry, the role of the OEB was considerably expanded pursuant to the *Ontario Energy Board Act, 1998*.[88] In this expansion, the OEB became responsible for regulating the electricity sector with the two principal objectives of:

- Protecting the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service

- Promoting economic efficiency and cost effectiveness in the electricity sector to facilitate the maintenance of a financially viable electricity industry

The OEB continues to regulate the electricity sector by licensing participants (including distribution companies) setting standards and performance targets for license holders, and approving transmission and distribution rates to allow transmitters and distributors to recover the cost of their investments, including a fair return on invested capital. The OEB is also responsible for developing energy policy and implementing directives from the provincial government. As a licensed distributor, THESL continues to operate within this framework, and is subject to active provincial regulation and oversight.

Although the provincial regulatory framework envisions promoting the use of cleaner energy sources and technologies (including renewable energy sources) and facilitating innovation in the electricity sector,[89] it has not yet evolved to fully embrace the climate emergency and the scale of energy transformation necessary to confront climate change.

As a licensed distributor, the provincial framework restricts THESL's business activities to distributing electricity (i.e. conveying electricity to multiple customers at 50 kV or less)[90] and the expressly permitted non-distribution activities of: (1) owning and operating certain generation and energy storage facilities; and (2) providing services relating to the promotion of electricity conservation and the efficient use of electricity, electricity load management and the promotion of cleaner energy sources, including alternative and renewable energy sources.[91] All other business activities must either be specifically permitted by order of the OEB or conducted through an affiliated corporation.

Furthermore, only the cost of distribution activities, as approved by the OEB, may be funded through rates charged to THESL customers. All other permitted non-distribution business activities must be financially separated from the distribution business, and must be funded through other sources.

This restriction on business activities limits THESL from making certain types of rate-regulated investments to aid customers in decarbonizing their footprint. For example, THESL cannot own and operate electric vehicle ("EV") charging infrastructure to advance the electrification of transportation, or invest in heat pumps to convert buildings from natural gas to electrical heating, as these business activities do not meet the statutory definition of distributing electricity.

Similarly, THESL is also unable to use its capabilities within the regulated business to empower affiliated businesses to undertake these activities. For example, THESL cannot share customer information, employees and system planning information with its affiliated companies. It is also unable to leverage its brand and reputation as a distributor to promote climate-driven affiliated businesses. These limitations are imposed by the OEB's *Affiliate Relationship Code* ("ARC") to protect competitive markets by preventing monopolies from providing an unfair business advantage to affiliated companies that compete in these unregulated markets.[92] The purpose of these limitations is based on the principles of fair competition: that monopoly utilities should not be allowed to use their monopoly power outside of their statutory function as electricity distributors within a defined franchise.

Although the regulatory framework does not permit THESL to make targeted investments in decarbonizing key sectors of the economy, as an electricity distributor, the utility remains a key partner of consumers, stakeholders and the City of Toronto in addressing climate change. As discussed in Part 3A, THESL can play a critical role in achieving the City's Net Zero Strategy, both in terms of climate mitigation efforts (ensuring that the grid is ready and able to enable electrification to reduce greenhouse gas ("GHG") emissions) and climate adaptation (ensuring that the grid is able to withstand the weather-related effects of climate change that have and will continue to emerge as a result of previous GHG emissions). Furthermore, THESL can support the City's decarbonization efforts through *Climate Advisory Services*.

Climate Advisory Services — New Division within Regulated Distribution Business

Climate Advisory Services, as described in detail in Part 3B, is an opportunity for Toronto Hydro to enable climate action over and above the regulated distribution business, by bringing cleantech solutions to Toronto Hydro customers in the areas of transportation electrification, building conservation and energy efficiency, and renewable generation and energy storage systems.

Climate Advisory Services can operate as a new division within the regulated distribution business (THESL) as it is aligned with the permitted non-distribution business activities that a licensed distributor may undertake — namely, the promotion of conservation, efficiency, load management and cleaner energy services.[93] As part of THESL, *Climate Advisory Services* will have access to customer information, system planning data, and highly skilled and experienced employees. This will enable the quick ramp-up of operations to target projects that have the highest impact in terms of GHG emission reductions.

As noted above, though it is permitted within the distribution company, the *Climate Advisory Services* business function cannot be funded through electricity distribution rates.[94]

Climate Capital Investments — New Unregulated Affiliate Subsidiary

A third opportunity for climate action is *Climate Capital Investments*, by which Toronto Hydro would own and operate climate action projects (see Part 3C). The potential activities that could be undertaken under *Climate Capital Investments* are not distribution activities and do not fall within the exemptions for permitted non-distribution activities by licensed distributors. For example, owning, operating and leasing EV chargers, heat pumps, solar photovoltaic panels or batteries to customers are not permitted non-distribution activities. Accordingly, *Climate Capital Investments* cannot occur within the regulated electricity distribution business.[95] Toronto Hydro must pursue *Climate Capital Investments* through a new affiliate subsidiary company.[96]

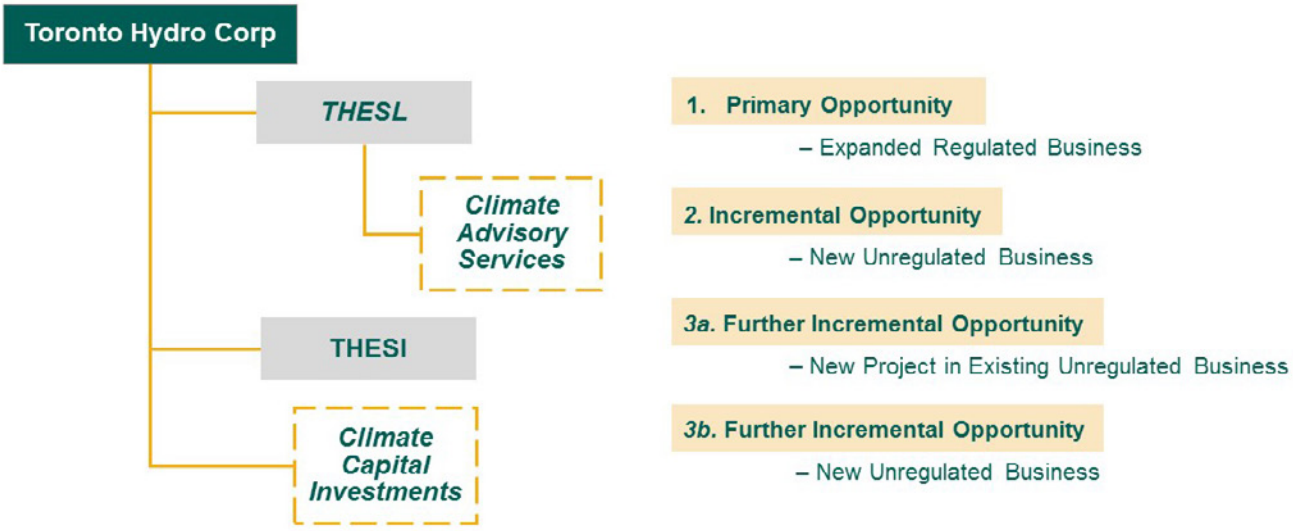
The ARC would govern the relationship between the affiliate subsidiary, *Climate Capital Investments*, and the regulated distributor, THESL. As an affiliate of THESL, *Climate Capital Investments* would not have access to the utility's customer or system planning information and would not be able to share key employees with the utility, including customer service and engineering personnel.[97]

Conclusion

There is ample opportunity for Toronto Hydro to undertake and facilitate climate action while still complying with the regulatory framework that governs and protects its mandate as an electricity distributor. Through its regulated business, the utility ensures that the grid is ready and able to safely and reliably accommodate electrification in order to reduce GHG emissions, and to withstand extreme weather events caused by climate change. The new business models — *Climate Advisory Services* and *Climate Capital Investments* — can be accommodated within the existing provincial regulatory framework to allow for rapid implementation. The limitations on permitted business activities of a regulated distributor dictates the structure of these new business models. *Climate Advisory Services* and THESL would be able to perform integrated climate action within the regulated business. *Climate Capital Investments* would be required to operate on a stand-alone basis,

engaging customers separately, and unable to benefit from the advancements made by these other Toronto Hydro operations. (See Figure 1.)

Figure 1: Toronto Hydro Corporate Structure for Climate Action



Appendix F: Government and Energy Market Programs

Toronto Hydro *Climate Advisory Services* will play a critical role in channeling government climate investment into Toronto to fuel the post-COVID-19 economic recovery. Through work with governments, customers, project developers, suppliers and innovators to overcome existing barriers, Toronto Hydro will help unlock greater amounts of funding for electrification solutions in Toronto.

There is a broad spectrum of government funding sources available for energy-related projects which support the reduction of greenhouse gas ("GHG") emissions. However, since there is no single source that can be relied upon to provide complete funding in assisting customers and local firms in accessing government supports, *Climate Advisory Services* will tap into every available source in order to make the climate action projects viable.

The following is a review of government programs which may support the climate action program areas reviewed in the Climate Action Plan. Additionally, relevant electricity market revenue opportunities and programs are also addressed.

Provincial Funding Landscape

At the provincial level, current funding for electricity-related projects focused on driving carbon emissions reductions is limited. The Independent Electricity System Operator's ("IESO") Grid Innovation Fund[98] is a $9.5 million annual fund which advances innovative opportunities to achieve electricity savings for Ontario ratepayers by funding projects that either enable customers to better manage their energy consumption or that reduce the costs associated with maintaining reliable operation of the provincial grid. The Grid Innovation Fund provides for partial funding (between 25 and 50%) of a project through grants over a maximum three-year period. It is not oriented toward GHG emissions reductions specifically, though that

may be a project objective in addition to, or compilatory with, innovation in energy consumption management and delivering efficiency through energy solutions. In particular, on June 22, 2021, the IESO announced that the Grid Innovation Fund will hold a joint, targeted call later this year with the Ontario Energy Board ("OEB") Innovation Sandbox to support research and demonstration projects that have the potential to provide value to consumers and the grid, especially with respect to integration of local generation in distribution grids.

The IESO also delivers the Save on Energy Retrofit Program,[99] which provides incentives to upgrade facilities with measures to reduce electricity consumption. The program covers up to $1 million or 50% of eligible costs. The participants in the Save on Energy Retrofit Program are owners and operators of industrial, commercial, institutional and multi-family residential buildings.

Federal Funding Landscape

Several of the federal government's current post-COVID-19 economic recovery stimulus spending programs place a focus on green infrastructure and clean-energy-related community investments relating to electrification. These programs also recognize that cities are an important partner for delivering complementary agendas of economic recovery and climate action, and a competitive cross-Canada landscape has already developed as proponents bring forward proposals. Projects are assessed on a number of factors, including GHG reductions, job creation and diversity, as well as stakeholder support, readiness and per dollar impact.

The following summaries cover a number of current federal funding programs, which may support the types of activities facilitated through Toronto Hydro's *Climate Advisory Services* model by climate action program area.

Transportation Electrification

- *Zero Emission Vehicle Infrastructure Program*[100]

The Zero Emission Vehicle Infrastructure Program ("ZEVIP") under Natural Resources Canada ("NRCan") has $280 million, available from 2021 to 2026, to provide grants and low-interest financing for charging and refueling stations across Canada. The program provides up to 50% of total project costs up to a maximum of $5 million per project. Several Request for Proposal rounds are expected per year, each targeting one or more infrastructure categories (e.g. multi-unit residential buildings, workplaces, public places, on-street, light-duty vehicle fleets, and medium- and heavy-duty vehicle fleets).

Toronto Hydro has good experience with this program, having made multiple applications and received approval for a program of chargers at Toronto Parking Authority facilities.

Building Conservation and Energy Efficiency

- *Commercial Building Retrofit Initiative*[101]

The Canada Infrastructure Bank is making $2 billion in loans available over three years to finance decarbonization retrofits in privately owned commercial buildings in Canada. It is looking to work with aggregators of projects who can bring together portfolios of projects valued over $25 million and will lend up to 80% of the cost of the retrofit work. There is a minimum GHG savings requirement of 30% for individual projects or 25% for projects within a portfolio.

- *Public Retrofits Initiative*[102]

The Canada Infrastructure Bank also provides financing for energy retrofit projects on infrastructure portfolios owned and/or managed by the public sector. The program works on an aggregate portfolio basis to develop project bundles of $50 million or higher. Financing amounts will typically be between 40% and 60% of total project costs. The key evaluation metric for these programs is GHG emission reductions and the volume of large building retrofits enabled. This program may also be applicable to the streetlight LED conversion project discussed in the Climate Action Plan report.

- *Green and Inclusive Community Buildings Program*[103]

Managed by Infrastructure Canada, this program will invest $860 million over five years (2021 to 2026) in non-repayable contributions to support the greening of community buildings, including through retrofits, repairs or upgrades of existing facilities. Municipally owned corporations are eligible for funding. The key evaluation metric for this program is GHG emission reductions. To be eligible for funding consideration, all retrofit projects are encouraged to achieve at least 25% in energy efficiency improvements compared to the building's baseline energy consumption.

Renewable Generation and Energy Storage

- *Smart Renewables and Electrification Pathways Program ("SREPs")*[104]

This program was launched on April 16, 2021 and is also operated under NRCan. It will provide $964 million over four years (2021 to 2024) in a mixture of grants and loans to support smart renewables and grid modernization deployment projects. Funding per project is capped at a maximum of $50 million, with no set limit as to the number of projects per proponent. For established renewables projects, including wind and solar, the maximum contribution is 10% of eligible costs. The percentage is higher for emerging renewables at 30%, which includes geothermal, concentrated solar, energy storage, offshore wind, and water current tidal or wave power. There is a recapture provision in this program which requires repayment of grants in part where projects earn profits in the first five years after funding.

A unique feature of this program is that it requires recipients to submit equity, diversity and inclusion plans. The criteria are strongly aligned with the social equity objectives of the Climate Action Plan. The key evaluation metrics of this program are megawatts of new renewables enabled, storage capacity enabled, avoided GHG emissions, and improvements in the ability of the grid to integrate renewables and other distributed energy resources.

- *Clean Power Fund*[105]

The Canada Infrastructure Bank will provide low-cost long-term loans to help deliver clean power projects. These loans are often focused on projects with revenue streams that are not typically sufficient for traditional investors, but which have the potential to deliver on GHG emission reductions and other critical outcomes. Financing is available for projects in the following spaces: clean power, renewable power generation, storage, and indigenous communities' transition into cleaner and more reliable sources of power.

The Clean Power Fund has been capitalized with an initial $2.5 billion over three years (2020 to 2023) and with a total of $5 billion over 10 years. The minimum project size that the Canada Infrastructure Bank will consider under this stream is $200 million. Portfolios of smaller aggregated similar projects may also be eligible.

- *Strategic Innovation Fund — Net Zero Accelerator*[106]

The Net Zero Accelerator under the Strategic Innovation Fund is focused upon rapidly expediting decarbonization projects with large emitters, scaling up clean technology and accelerating Canada's industrial transformation, including large-scale electrification of processes. Operated under the Department of Innovation, Science and Economic Development, the program has $8 billion available in funding over seven years, combining loans and grants. Key evaluation metrics are GHG emission reductions, the deployment of innovation, and job creation.

Provincial Grid Market Revenue Sources and Programs

Some climate action projects facilitated by *Climate Advisory Services* may be aligned with IESO market activities and may compete for revenues from the wholesale market. The IESO administers Ontario's wholesale electricity and ensures the efficient operation of the provincial grid. This includes a real-time, competitive market for energy and operating reserves,[107] annual Capacity Auction[108] and other medium- and long-term procurements for capacity, and contracts for ancillary services. Demand response resources (including aggregated load-controlled devices such as heat pumps) and new electricity generation projects (including energy storage and solar) are expected to be eligible to compete to provide electricity services (i.e. energy, capacity and ancillary services) through the IESO-administered markets. The revenue a generator or demand response provider may receive from IESO markets will depend on the magnitude of grid needs and

amount of market competition to provide services. With respect to recent IESO Capacity Auctions, demand response resources make up the majority of resources competing to provide capacity.[109]

Though not a direct funding or market revenue program, the Industrial Conservation Initiative[110] allows larger electricity users to reduce the Global Adjustment portion of their electricity bill if they can avoid consumption from the electricity grid during the top five peak electricity demand hours of the year. Typically, under this model, a technology service provider operates infrastructure at the customer's site (e.g. energy storage) designed to reduce the load's draw from the electricity grid. The customer may use the electricity cost savings to finance the infrastructure or invest in other load control devices, or may enter into a cost-sharing agreement with the infrastructure service provider.

Appendix G: Prospective Examples of Helping Remove Barriers to Climate Action

Figure 1: Helping to Resolve Barriers Faced by Customers

Barriers to Climate Action Facing Customers	How a Climate Services Business Could Help Remove Barriers	Potential Climate Action Outcomes
Customer does not want to act/ does not have a plan/does not have access to advice or help	Stimulate the demand-side of the market with marketing and direct engagements with customers	Potential to grow the demand-side of the climate action market
Customer needs a plan to take climate action	Work directly with customers to build personalized climate action plans	Potential to convert climate interest into action readiness
Customer needs advice and help selecting cleantech companies and their products and services	Develop a list of qualified cleantech companies and preferred pricing for each customer	Potential to resolve uncertainty and confusion about who to hire for climate products and services
Customer needs advice and help finding subsidies	Develop a current list of subsidies and help customers file applications	Potential to resolve uncertainty and confusion about how to afford climate projects
Customer is ineligible for particular grants or economic benefits due to small size of prospective project	Aggregate similar projects together in similar geographic locations	Potential to increase the scale of the projects on the demand-side of the climate action market
Customer needs repeat reminders and encouragement to work their plan and adjust it over time	Maintain ongoing contact with customers to keep them working on their up-to-date action plans	Potential to help the customer continue to implement their plan for ongoing climate action

Figure 2: Helping to Resolve Barriers Faced by Cleantech Companies

Barriers to Climate Action Facing Cleantech Companies	How a Climate Services Business Could Help Remove Barriers	Potential Climate Action Outcomes
Cleantech needs to know what climate products and services are in demand	Meet with cleantech to help them develop products and services by sharing real-world customer needs	Potential to grow the supply-side of the climate action market
Cleantech needs credibility with customers and access to them	Qualify cleantech and their products and services to a reputable list	Potential to help credible cleantech solutions cut through the noise and gain customer attention
Cleantech needs advice and help finding subsidies	Develop a current list of subsidies and help cleantech file applications	Potential to increase the number of implementation-ready projects
Cleantech needs to communicate policy barriers to policymakers	Link cleantech with policymakers and aggregate insights for own advocacy	Potential for policies to better reflect what is needed to stimulate and support climate action

Figure 3: Helping to Resolve Barriers Faced by Climate Action Funders

Barriers to Climate Action Facing Funders	How a Climate Services Business Could Help Remove Barriers	Potential Climate Action Outcomes
Funder needs to identify what types of climate action projects are in-demand	With no financial interest, meet with funder to help develop subsidies by sharing real-world customer needs	Potential to increase the pool of subsidies and other supports useful to customers
Funder needs to pair appropriate subsidies and other supports with available climate action projects	With no financial interest, meet with funder to help develop subsidies by sharing real-world cleantech needs	Potential to increase the pool of subsidies and other supports useful to cleantech companies
Funder needs to understand how subsidies and other supports are playing out on the ground	With no financial interest, meet with funder to explain how subsidies are and are not working	Potential for funders to design better subsidies and other supports
Funder needs to receive eligible, quality applications from customers and cleantech	Help eligible applicants prepare and file quality applications	Potential for more money to get from funders to the worthwhile climate projects of customers and cleantech companies

Figure 4: Helping to Resolve Barriers Faced by Climate Action Policymakers

Barriers to Climate Action Facing Policymakers	How a Climate Services Business Could Help Remove Barriers	Potential Climate Action Outcomes
Policymaker needs to understand how existing policies are stifling on the ground action by customers and cleantech companies	With no financial interest, meet with policymaker to share real-world implications of policies	Potential changes to policies that are stifling climate action
Policymaker needs to understand how new policies could increase climate action by customers and cleantech companies	With no financial interest, meet with policymaker to identify opportunities	Potential creation of new policies that can spur climate action
Policymaker needs to understand how policies are adversely interacting with the policies of other levels of governments or regulatory bodies	Meet with policymaker to explain conflicts and devise comprehensive solutions	Potential to better align climate action policies within and across levels of government
Policymaker needs to receive credible, comprehensive briefings on the status of climate action	Brief governments on the state of climate action	Potential improvements in climate-related decision-making by governments
Policymaker needs to receive measurable and reliable metrics or benchmarking to use to report on the status of climate action to spur public action	Produce public reports on the state of climate action	Potential increases in public awareness and support for climate action

Appendix H: Confidential Appendix

Details concerning corporate finance items are set out in the Confidential Appendix H, in accordance with securities law requirements arising from Toronto Hydro Corporation's status as an offering corporation under the *Business Corporations Act* (Ontario), R.S.O. 1990, c.B.16, its status as a reporting issuer under the *Securities Act* (Ontario), R.S.O. 1990, c.S.5, and the application by the Ontario Securities Commission of National Instrument 51-102 (Continuous Disclosure Obligations).

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[90] *OEB Act* at s. 3.

[91] *OEB Act* at s. 71.

[92] Ontario Energy Board. *Affiliate Relationships Code for Electricity Distributors and Transmitters* (March 15, 2010), available at: https://www.oeb.ca/industry/rules-codes-and-requirements/affiliate-relationships-code-electricity-arc

[93] *OEB Act* at s. 71.

[94] For a more detailed discussion of *Climate Advisory Services* funding options, see Part 3B.

[95] As non-distribution activities, *Climate Capital Investments* cannot be funded through distribution rates.

[96] *Climate Capital Investments* action relating to the modernization of the streetlighting system would occur within Toronto Hydro's established affiliated subsidiary, Toronto Hydro System.

[97] The affiliate subsidiary would be permitted to share certain corporate services with utility in accordance with the provisions of the OEB's *Affiliate Relationships Code*.

[98] IESO, *Grid Innovation Fund Overview*, available at: https://www.ieso.ca/en/Get-Involved/Funding-Programs/Grid-Innovation-Fund/Overview

[99] Save ON Energy, *Retrofit Program*, available at: https://saveonenergy.ca/en/For-Business-and-Industry/Programs-and-incentives/Retrofit-Program

[100] Government of Canada, *Zero Emission Vehicle Infrastructure Program*, available at: https://www.nrcan.gc.ca/energy-efficiency/transportation-alternative-fuels/zero-emission-vehicle-infrastructure-program/21876

[101] Canada Infrastructure Bank, *Applicant Guide — Commercial Building Retrofit Initiative* (2021), available at: https://cib-bic.ca/wp-content/uploads/2021/05/CIB-Commercial-Building-Retrofits-Initiative-Applicant-Guide.pdf

[102] Canada Infrastructure Bank, *Public Retrofits Initiative* (2021), available at: https://cib-bic.ca/wp-content/uploads/2021/05/CIB-Public-Retrofits-Initiative-Overview.pdf

[103] Government of Canada, *Green and Inclusive Community Buildings Applicant Guide*, available at: https://www.infrastructure.gc.ca/gicb-bcvi/applicant-guide-demandeur-eng.html

[104] Natural Resources Canada, *Smart Renewables and Electrification Pathways Program* (2021), available at: https://www.nrcan.gc.ca/sites/nrcan/files/energy/pdf/NRCan%20ENG%20Final%20-%20SREPs%20Applicant%20Guide_accessible_E_final.pdf

[105] Canada Infrastructure Bank, *Canada Infrastructure Bank's Growth Plan Backgrounder*, available at: https://cib-bic.ca/en/canada-infrastructure-banks-growth-plan-backgrounder/

[106] Government of Canada, *A Healthy Environment and a Healthy Economy: Canada's strengthened climate plan to create jobs and support people, communities and the planet* (2020), at pages 36-37, available at: https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf

[107] Operating Reserve is capacity that is on standby, able to ramp up on short notice, primarily in response to a major outage of a generating unit or transmission component, which reduces the capacity available to supply the system.

[108] Capacity is the ability to provide energy on demand. The IESO's first Annual Acquisition Report outlines the use of annual Capacity Auctions and other competitive procurements (i.e. medium- and long-term needs) for capacity needs emerging in mid-2020s, available at: https://www.ieso.ca/en/Sector-Participants/Planning-and-Forecasting/Annual-Acquisition-Report

[109] IESO's most recent Capacity Auction Results, available at: https://www.ieso.ca/en/Sector-Participants/IESO-News/2020/12/Capacity-Auction-Results-Demonstrate-the-Value-of-Competition

[110] For more information on the Industrial Conservation Initiative, see https://www.ieso.ca/-/media/Files/IESO/Document-Library/global-adjustment/ICI-Backgrounder.ashx

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Certain information included in this document constitutes "forward-looking information" within the meaning of applicable securities legislation. The purpose of the forward-looking information is to provide Toronto Hydro's proposals for climate action opportunities as well as its current expectations regarding future results of operations, performance, business prospects and opportunities, and may not be appropriate for other purposes. All information, other than statements of historical fact, which address activities, events or developments that we expect or anticipate may or will occur in the future, are forward-looking information. The words "arise," "can," "could," "expects," "extrapolate," "focus," "further," "future," "intends," "likely," "may," "might," "near," "objective," "opportunity," "plans," "potential," "propose," "projects," "should," "will," "would," or the negative or other variations of these words or other comparable words or phrases, are intended to identify forward-looking information, although not all forward-looking information contains these identifying words. The forward-looking information reflects Toronto Hydro's current beliefs and is based on information currently available to Toronto Hydro.

Specific forward-looking information in this document includes, but is not limited to, statements regarding: Toronto Hydro's proposed corporate performance metrics relating to environmental performance; extrapolations from City of Toronto modelling and the potential for direct investments in climate action infrastructure to build a grid capable of supporting the realization of the City's Net Zero Strategy; extrapolations of potential Toronto Hydro asset base and distribution revenue growth from the City's Net Zero Strategy; the portion of the City's Net Zero Strategy for greenhouse gas ("GHG") reduction that is dependent upon investments in Toronto Hydro's distribution grid; potential requirements for additional equity to maintain Toronto Hydro's strong balance sheet arising from the City's Net Zero Strategy and related distribution infrastructure investments; potential impacts on customer bills of the expanded investment in Toronto Hydro's electricity distribution system; requirements for government and regulator support for electricity distribution solutions in achieving net zero GHG emissions to ensure electricity is affordable

for customers; the potential for establishing a Toronto Hydro Climate Advisory Services model subject to a supportive mandate from the City of Toronto; the program costs of the Climate Advisory Services Model; the program unit size and financial value of climate action activities that could be facilitated in the economy through Climate Advisory Services; the areas of focus and the types of advisory services potentially related to the Climate Advisory Services model; the potential increase in electrification in Toronto contributed to by Climate Advisory Services; the potential for increased distribution revenue and net income for Toronto Hydro arising from electrification; potential for reduction in net income due to self-funding of the Climate Advisory Services program by Toronto Hydro compared to not taking any action; potential implementation strategies for Climate Advisory Services; the potential for implementation of a city-wide streetlight LED conversion program, including the costs, timeline and potential sources of funding for such a program; the potential for Toronto Hydro to undertake unregulated climate action investments through the Climate Capital Investments model and the source of funding for such investments; the mandates required from the City of Toronto for Toronto Hydro to undertake proposed climate action opportunities; engagement by Toronto Hydro with potential municipal and commercial business partners and customers to implement its climate action plan if provided with proposed mandates; the size and nature of federal government funding commitments to Canada's "green recovery" and the applicability of such programs to Toronto Hydro's climate action plan program areas; projections as to the share of federal government funding applicable to Toronto Hydro's climate action plan program areas, which could be available to Toronto businesses and customers based on Toronto's proportion of the national population; projections by non-government agencies with respect to the growth of investments in energy generation and infrastructure, and in energy-dependent end-use products; projections by the City of Toronto with respect to retrofit investments in buildings in Toronto; projections by the City of Toronto concerning growth of the use of electric vehicles ("EVs") and the investments in EV chargers required to meet that growth; Toronto Hydro's commitment to achieve net zero GHG emissions in its own operations by 2040; the strategic priority areas identified as the focus for Toronto Hydro's planning of its utility of the future; projections concerning the increase in electricity consumption based on full electrification of Ontario's economy; extrapolations of system peak demand based on the City's Net Zero Strategy; projections as to increased transmission and distribution infrastructure needed to adapt to climate change; projections of reductions to the costs of climate change by undertaking proactive infrastructure adaptation; the necessity of enhanced demand management and grid optimization strategies to deal with projected increases in the use of EV, heat pumps and other climate mitigation technologies; the significant portion of Toronto Hydro's distribution assets expected to reach the end of their useful lives in the next 25 years; projected expansions to Ontario's electric system capacity to meet the province's peak needs; the number of major transformer stations that would be required in Toronto to meet the projected increased system capacity needs; the projected increase in Toronto Hydro's local demand response program by 2024;

prospective projects that could be facilitated under each of Toronto Hydro's climate action plan program areas; projected losses from heat pump investments without subsidies; projections concerning the decline of the proportion of grid-delivered electricity that is non-GHG emitting in Ontario; the projected increase in the Hourly Ontario Electricity Price out to 2040; and energy and GHG emissions reductions and cost savings arising from a streetlight LED conversion program in Toronto.

The forward-looking information is based on estimates and assumptions made by Toronto Hydro's management in light of past experience and perception of historical trends, current conditions and expected future developments, the City's Net Zero Strategy, and the review of Toronto Hydro's climate action plan by Toronto City Council, as well as other factors that management believes to be reasonable in the circumstances, including, but not limited to: the impacts of climate change; continued development and efficiency gains of electrification technologies; Toronto Hydro's level of indebtedness; changes in funding requirements; the future course of the economy, financial markets and levels of investment in commercial and/or residential construction projects in Toronto; no unforeseen delays and costs in Toronto Hydro's capital projects; no unforeseen or unfavourable changes in the legislative and operating framework and related government policy for electricity distribution in Ontario; the receipt of applicable regulatory approvals and requested rate orders; no unexpected delays in obtaining required approvals; the expected development of federal, provincial and municipal policies relating to climate change and supportive funding programs; the ability of Toronto Hydro to obtain and retain qualified staff, equipment and services in a timely and cost-efficient manner; no unforeseen changes in electricity distribution rate orders or rate setting methodologies; no unfavourable changes in environmental regulations; no unforeseen change of landscape for competitive forces in the electricity distribution industry in Ontario; the useful life of Toronto Hydro's assets; the future prices of components of residential electricity prices; the receipt of favourable judgments; the level of interest rates; Toronto Hydro's ability to borrow; Toronto Hydro's credit ratings; customer demand; and assumptions regarding general business and economic conditions.

The forward-looking information is subject to risks, uncertainties and other factors that could cause actual results to differ materially from historical results or results anticipated by the forward-looking information, which are discussed in sections entitled "Forward-Looking Information" and "Risk Factors" in Toronto Hydro Corporation's annual information form ("AIF") and the sections entitled "Forward-Looking Information" and "Risk Management and Risk Factors" in Toronto Hydro Corporation's management's discussion and analysis ("MD&A"), which are available electronically at sedar.com. All of the forward-looking information included in this document is qualified by the cautionary statements in this "Disclaimer" section and the sections entitled "Forward-Looking Information" and "Risk Factors" in Toronto Hydro's AIF, and the sections entitled "Forward-Looking Information" and "Risk Management and Risk Factors" in Toronto Hydro Corporation's MD&A. These

factors are not intended to represent a complete list of the factors that could affect Toronto Hydro; however, these factors should be considered carefully and readers should not place undue reliance on forward-looking information provided herein.

Further, the information (including forward-looking information) contained herein is dated as of the date of this document or as of the date specified in this document, as the case may be, and Toronto Hydro has no intention and undertakes no obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, except as required by law.