



SUBJECT: Burlington Hydro Sustainability Plan

TO: Committee of the Whole

FROM: Environment and Energy

Report Number: EICS-12-24

Wards Affected: all

Date to Committee: July 8, 2024

Date to Council: July 16, 2024

Recommendation:

Receive environment and energy report EICS-12-24 providing the Burlington Enterprises Corporation – Burlington Distribution System Sustainability Plan.

PURPOSE:

The purpose of this report is to present the Burlington Distribution System Sustainability Plan by Burlington Enterprises Corporation (BEC).

Vision to Focus Alignment:

- Designing and delivering complete communities
- Providing the best services and experiences
- Protecting and improving the natural environment and taking action on climate change
- Driving organizational performance

Executive Summary:

The Burlington Distribution System Sustainability Plan (Sustainability Plan) was prepared by Burlington Enterprises Corporation (BEC) to determine current and planned actions by Burlington Hydro needed to support the City of Burlington's climate mitigation and adaptation plans and actions.

BEC is preparing its distribution system and operations for the future, identifying new infrastructure needs, adopting climate adaptation measures to improve resilience, and supporting community climate action. The Sustainability Plan was developed using a

Climate Action Scenario for the purpose of developing a long-term electricity demand forecast presenting near, medium, and long-term actions for BEC to implement. Near-term (years 2025-2030) actions include:

1. Address existing overloading and Aldershot growth centre.
2. Enhance electricity demand forecasting and analytics for future planning cycles.
3. Continue enhancing distribution operations with grid modernization technology.
4. Enable electric vehicle charging.
5. Continue engaging with stakeholders.

Medium and long-term (years 2030-2050) actions to manage accelerating electricity demand growth and emerging distribution system capacity needs, include:

- Building on data analytics and the distribution automation investments.
- Work collaboratively with Hydro One and the IESO to ensure distribution needs are reflected in the regional planning and bulk transmission planning processes.
- Consider investments needed to meet accelerating electricity demand growth within the context of regulatory funding mechanisms available.

There is a significant risk of doing nothing to prepare for increasing electricity demand and the changing climate. Grid investments are required to ensure capacity for the system due to increasing electricity usage for electric vehicles and thermal energy. There is also an economic benefit to invest in the grid as businesses are more likely to be attracted to a forward-thinking community with a resilient and modern grid to meet electrical needs versus a system that has not been maintained, modernized, expanded and/or updated to be resilient.

Background and Discussion:

The attached Burlington Distribution System Sustainability Plan (Sustainability Plan) presented by Burlington Enterprises Corporation (BEC) is in response to the request made by Burlington City Council in 2022 ([EICS-11-22](#)) to complete a Sustainability Plan with the following information:

- Current and planned actions by Burlington Hydro to support the programs and the target outlined in the City's Climate Action Plan to be a net carbon neutral community by 2050;
- Infrastructure investments required to support electric mobility (electric vehicles, electrification of fleets, electric transit buses and bi-directional charging), electrification of thermal energy (air source heat pumps), solar energy and battery storage;

- Burlington Hydro's investment plans to improve resiliency of the local distribution grid given increasing frequency and intensity of severe weather events, as identified through *Climate Resilient Burlington: A Plan for Adapting to Our Warmer, Wetter and Wilder Weather*; and
- A process for stakeholder and community engagement.

Burlington Enterprises Corporation (BEC) is preparing its distribution system and operations for the future, identifying new infrastructure needs, adopting climate adaptation measures to improve resilience, and supporting community climate action. As electricity usage increases, BEC must ensure that grid infrastructure is scaled to meet customer electricity needs. Potential changes that can increase electricity demand include population growth, increased manufacturing, and climate change actions and impacts (i.e. electric vehicles and increased heat events).

BEC is not starting from ground zero to prepare for increased electrification and managing the risks of a changing climate. The following provides highlights from BEC's Sustainability Plan, including measures that BEC is already implementing or planning for, and additional recommended actions. For further detail, refer to the Burlington Distribution System Sustainability Plan in Appendix A.

BEC has developed preventative maintenance and asset management practices that support resilience to extreme weather, including:

- Annual asset maintenance and testing for critical assets to mitigate impacts of climate change and unplanned failures.
- Embedding resilience in asset management planning processes and targeting replacement of deteriorated assets.
- Grid hardening measures including replacement of submersible transformers with pad-mounted transformers as mandated by the Canadian Standards Association due to increasing occurrences resulting in failures.
- Implementing a proactive vegetation management program.
- Updating the emergency response plans and coordinating with the City.

BEC is also undertaking two studies to better integrate new technology in distribution planning:

- Engaging in research in partnership with McMaster University to understand distribution system impacts of EV charging and heating electrification; and
- Completing a study on the technical and financial feasibility of battery energy storage solutions as a non-wire alternative.

BEC's grid modernization strategy focuses on using field-proven solutions to automate circuit protection and switching, such as:

- Installing distribution automation and sensor technology including smart devices which help reduce customer interruption time after a fault.
- Enhancing cybersecurity measures.
- Partnering with [Grid Smart City](#) to evaluate benefits of next generation advanced metering infrastructure.

Additional climate actions by BEC include:

- A comprehensive Carbon Inventory and Decarbonization Roadmap for its operations.
- Implementing [Green Button](#) and a portal to help customers manage their energy usage.

The Burlington Distribution System Sustainability Plan presents further actions for BEC to implement in the near-term (years 2025-2030):

1. **Address existing overloading and Aldershot growth centre** – BEC will continue to work closely with the IESO and Hydro One as part of the regional planning process to assess infrastructure investments.
2. **Enhance electricity demand forecasting and analytics for future planning cycles** – preparation for electric vehicle adoption and other sources of electricity demand growth, BEC can enhance its data and analytics capabilities.
3. **Continue enhancing distribution operations with grid modernization technology** – replacing its current Outage Management Systems later in 2024 and additional investments in distribution automation and sensing technologies.
4. **Enable electric vehicle charging** – focus on developing partnerships with customers to enable EV charger installation and participate in the OEB's Electric Vehicle Integration Initiative.
5. **Continue engaging with stakeholders** – to identify and satisfy more complex customer needs and to facilitate the connection of distributed solar, EV chargers, and other clean energy technologies.

Medium and long-term (years 2030-2050) actions to manage accelerating electricity demand growth and emerging distribution system capacity needs, include:

- Building on data analytics and the distribution automation investments.
- Work collaboratively with Hydro One and the IESO to ensure distribution needs are reflected in the regional planning and bulk transmission planning processes.
- Consider investments needed to meet accelerating electricity demand growth within the context of regulatory funding mechanisms available.

Strategy/process/risk

Burlington Hydro retained Power Advisory to complete the Sustainability Plan. The preparation of the plan entailed:

- Creating a Climate Action Scenario and accompanying electricity demand forecast aligned with the climate action initiatives outlined in the City of Burlington's Climate Action Plan,
- Identifying distribution system requirements to accommodate anticipated electricity demand growth (from both climate action and population growth), and
- Outlining planned actions and next steps. These actions encompass measures aimed at improving climate resilience and supporting customers through the energy transition.

Assumptions and conditions were identified that influence electricity demand and are used to explore the effects of growth and electrification over time.

There is a significant risk of doing nothing to prepare for increasing electricity demand and the changing climate. Grid investments are required to ensure capacity for the system due to increasing electricity usage for electric vehicles and thermal energy. There is also an economic benefit to invest in the grid. Businesses are more likely to be attracted to a forward-thinking community with a resilient and modern grid to meet electrical needs versus a system that has not been maintained, modernized, expanded and/or updated to be resilient.

Options Considered

BEC will consider the options available as they monitor their system, growth in electrification and actions required to prepare for climate change impacts.

Financial Matters:

As part of its planning process and next steps, BEC will evaluate the investment options associated with this Sustainability Plan including costs, customer outcomes, and impact to the distribution service rates charged by Burlington Hydro. Investments and rates are approved by the Ontario Energy Board during a full review of Burlington Hydro's rates every five years. Burlington Hydro's next full review of its rates occurs in 2025, which requires Burlington Hydro to file a 5-year Distribution System Plan (DSP). The DSP will outline Burlington Hydro's investments and plans for distribution grid expansion and modernization to continue to address climate change and support electrification.

Climate Implications:

Burlington's Climate Action Plan and Corporate Energy and Emissions Management Plan rely on electrification to support thermal energy and electric mobility to transition away from the use of fossil fuels, helping to meet the City's climate targets:

- To be a net carbon neutral community by 2050, and
- For City operations to be net carbon neutral by 2040.

BEC's Distribution System Sustainability Plan is a critical component to support future actions. The City will not meet its goals without the further investment to ensure a local distribution grid that is capable of supporting key climate actions.

In addition, as noted in the City's Climate Resilient Burlington – A Plan for Adapting to Warmer, Wetter and Wilder Weather, BEC's continued investment in measures to ensure a resilient grid are just as critical.

Engagement Matters:

BEC's stakeholder engagement included:

- Coordinating with City of Burlington staff to ensure alignment with scenario development;
- Delivering a presentation to the Burlington Climate Action Stakeholder Team to seek feedback on the proposed approach;
- Engaging with a group of electricity sector representatives to receive additional advice on climate action and its impact on the distribution sector; and,
- Conducting a survey with the community to solicit feedback and determine their priorities, and holding a public webinar to inform community members about the process and development of the Sustainability Plan.

Survey respondents indicated that the largest barrier to participation in climate action initiatives is cost, followed by a lack of information and too many requirements or effort. Maintaining reliability and resilience of the distribution system was rated as a top priority. Secondary priorities were enabling renewable energy connections, enabling electrification, and supporting energy efficiency programs.

Respondents also advised of the need to accelerate climate action initiatives and ensure transparency and engagement with the community.

Conclusion:

Burlington Enterprises Corporation has been a longstanding and key stakeholder in the implementation of the City's climate plans, including the original Community Energy Plan in 2014. Staff look forward to future collaboration with BEC staff as we work together to achieve our climate related targets and objectives.

Respectfully submitted,

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Appendices:

- A. Burlington Distribution System Sustainability Plan

Report Approval:

All reports are reviewed and/or approved by Department Director, the Chief Financial Officer and the Executive Director of Legal Services & Corporation Counsel.