



Burlington **enterprises**
corporation

Burlington Enterprises Corp: Sustainability Plan



City of Burlington:
Committee of the
Whole Meeting

July 8, 2024



Partner since 2009



Background

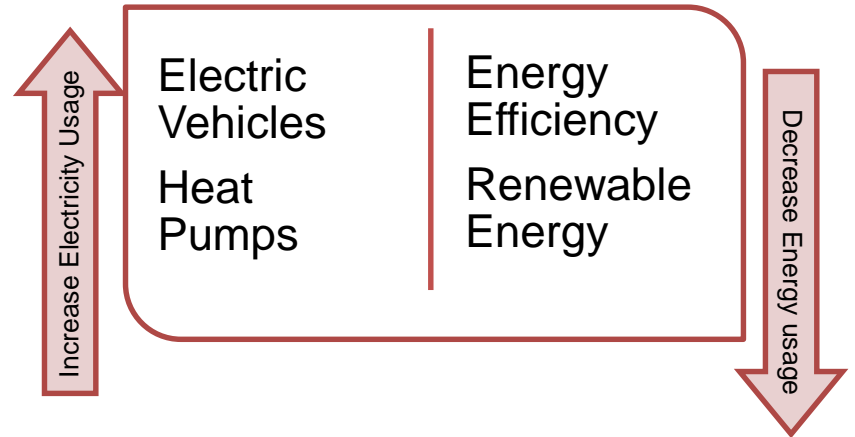
- In response to the City of Burlington’s Climate Action Plan and its commitment to be a net carbon-neutral community by 2050, Burlington Enterprises Corporation (“BEC”)*, through Burlington Hydro is committed to supporting the City of Burlington’s climate goals and ensuring its distribution system is prepared for these changes.
- BEC prepared Sustainability Plan to develop strategies to continue to evolve its distribution system to meet electrification needs and ensure continued resiliency in the face of more frequent extreme weather events.
- BEC retained [Power Advisory](#) to support the development of the Sustainability Plan, including:
 - Modelling and translating the changes to electricity demand resulting from key initiatives from the City of Burlington’s Climate Action Plan onto the electricity system
 - Identifying the impacts on the distribution system that need to be accounted for in BEC’s planning processes
 - Conducting community and stakeholder engagement to inform the Sustainability Plan
- The Sustainability Plan highlights potential changes to consider including investment decisions to expand the system as well as energy efficiency programming.

*During the remainder of this presentation BEC will refer to BEC and Burlington Hydro



Why is BEC Preparing a Sustainability Plan?

- Electricity distribution companies are responsible for planning the distribution system to ensure there is sufficient and reliable grid capacity to deliver electricity to customers year-round
 - As electricity usage increases, BEC must make sure that grid infrastructure is scaled to meet customer demands
 - Potential changes that would increase electricity demand include: population growth, electric vehicles, heat pumps and climate change impacts on weather
 - Potential changes that could reduce electricity demand include battery storage, solar and energy efficiency
 - Climate change is leading to increased extreme weather events which makes the distribution system more vulnerable to damage and customers prone to outage events
- The complexity of all these changes will require an evolution in the day-to-day operations of the distribution system

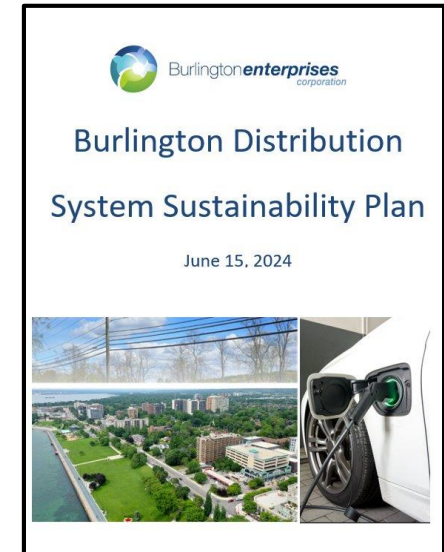




Sustainability Plan

- The BEC Sustainability Plan provides an overview of the distribution system under a specific set of assumptions
- The first step in this study was to develop a '**Climate Action Scenario**'*; which would be used throughout the report to understand the impacts on the electricity distribution system, including:
 - Demand Forecast
 - Distribution system needs
 - Climate Resilience
 - Assessment of next steps

*A Climate Action Scenario is a scenario that specifies a set of assumptions and conditions that influence electricity demand and is used to explore the effects of growth and electrification over time.

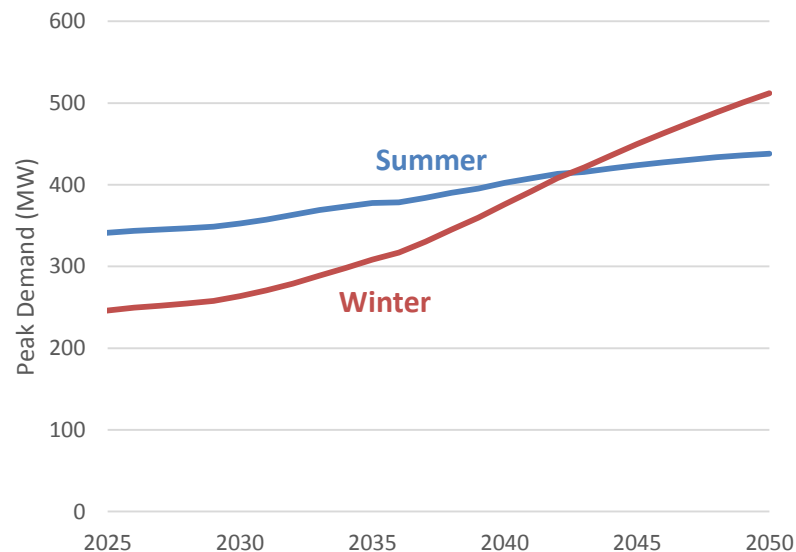




BEC's Forecasted Summer and Winter Peak Demand

Sustainability Plan

- Customers' electricity consumption varies throughout the day (i.e., usage of lighting, appliances, etc.) and varies seasonally (i.e., usage of air conditioning in summer)
- The maximum amount of electricity consumed by customers at any given time in an area is referred to as the peak demand, that is the power rating of the distribution system, which is typically measured in megawatts (MW)
- Distribution systems are built to meet the annual peak demand forecast (historically, occurs in the summer)
- In the Climate Action Scenario, Power Advisory forecasts that in the 2040's the overall system peak will shift from the summer to winter due to the adoption of new technology like EVs and heat pumps

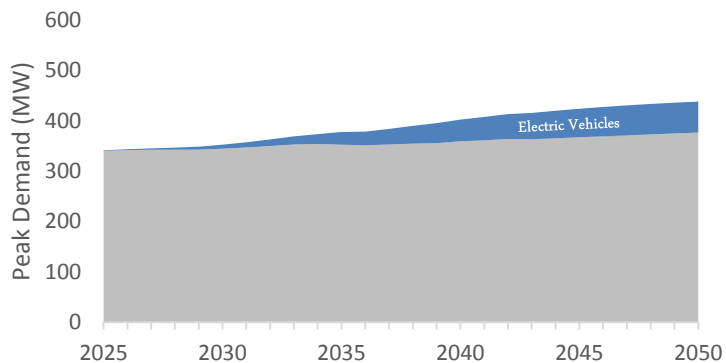




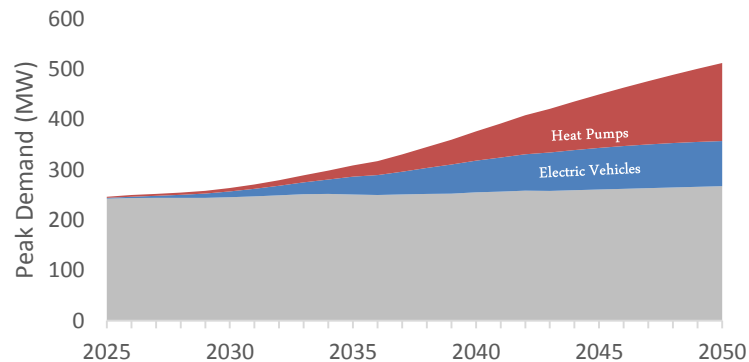
Impact of Electrification on Peak Demand

Sustainability Plan

Summer



Winter

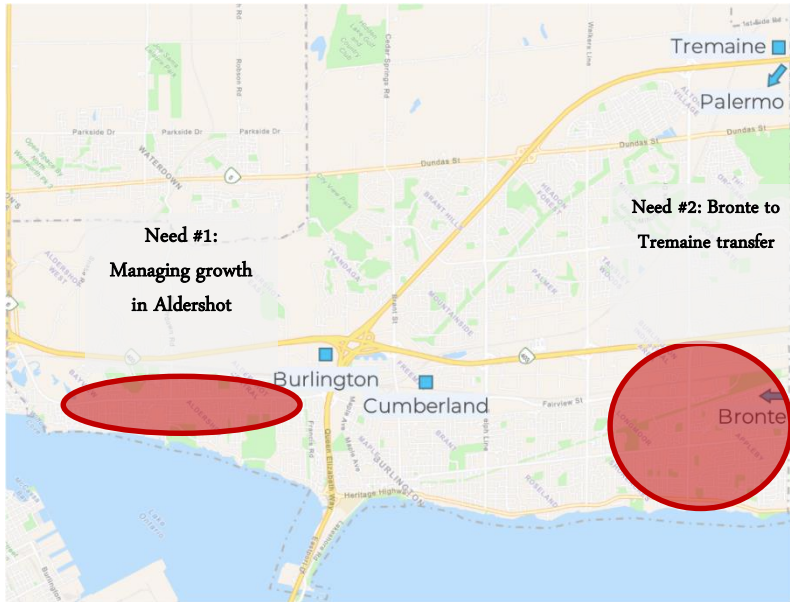


- Most of the anticipated growth in peak demand is due to electrification
 - The **Climate Action Scenario** prioritizes energy efficiency, which largely offsets the impact of population and employment growth



Summary of Distribution System Needs

Near Term: 2025 to 2030



Long Term: 2030 to 2050

- In the 2030s:
 - Investments will be needed on the lower voltage primary system to enable electrification and continue connecting new customers
 - To better anticipate needs, BEC will continue enhancing data analytics/forecasting and coordinate directly with large customers (e.g., public EV charging stations, commercial vehicle fleets, real estate) developers
- In the 2040s:
 - Needs continue to grow around load centres (e.g., Major Transit Station Areas)
 - BEC may require more high-voltage transformer station capacity; this need would be identified and met in coordination with Hydro One and IESO



A Climate Resilient Distribution System

Sustainability Plan

The OEB's recent report "Improving Distribution Sector Resilience, Responsiveness and Cost Efficiency," made recommendations to improve distribution sector resilience.

Recognizing the increasingly unpredictable climate, it is appropriate for BEC to consider a range of climate adaptation measures to improve resilience. Examples of climate adaptation measures include:

1. Assets Design and Grid Hardening
2. Resilient Distribution Planning
3. Grid Modernization
4. Modifying Operations
5. Others: Redundancy and backup systems, climate-informed planning, emergency response and recovery plans, community engagement and communications, regulatory/standards compliance, and training and capacity-building initiatives.





BEC's Next Steps

Sustainability Plan

- BEC's near-term plan (2025-2030) includes the following actions:
 - **Action 1:** Address Existing Overloading and Aldershot Growth Centre
 - **Action 2:** Enhance Electricity Demand Forecasting and Analytics for Future Planning Cycles
 - **Action 3:** Continue Enhancing Distribution Operations with Grid Modernization Technology
 - **Action 4:** Enable Electric Vehicle Charging
 - **Action 5:** Continue Engaging with Stakeholders
- The medium- and long-term plan focuses on managing accelerating electricity demand growth and emerging distribution system capacity needs



Financial Matters

Sustainability Plan

- 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



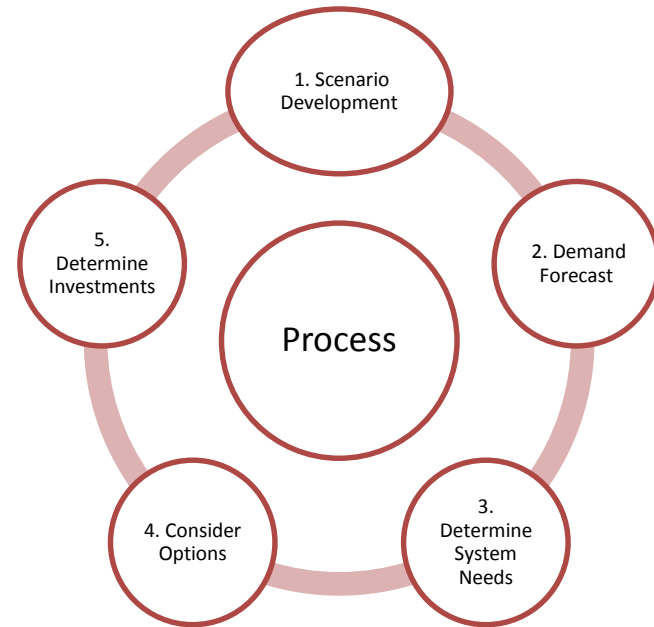
APPENDIX



Overview of Approach

Sustainability Plan

- BEC developed a **Climate Action Scenario** which leverages the City of Burlington's Climate Action Plan
- The long-term electricity demand forecast predicts the timing, location, and magnitude of distribution system needs based on assumptions established by the Climate Action Scenario
- This assessment identifies when system needs arise and proposes different options to address them, including traditional solutions like poles and wires, as well as emerging non-wire technologies
- **Stakeholder Engagement Approach:** Involving customers, community members, and other stakeholders in the development of this Sustainability Plan was an essential part of the process.

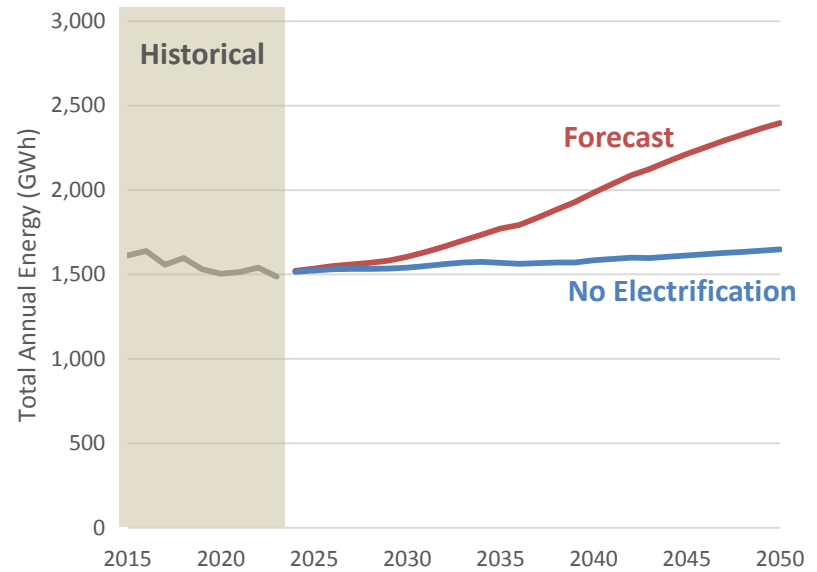




BEC's Annual Energy (GWh) Forecast

Sustainability Plan

- Power Advisory forecasted annual energy usage based on the City of Burlington's Climate Action Plan, and other regional plans for housing and economic development
- Annual energy consumption in the City of Burlington reaches nearly 2,500 GWh by 2050, approximately **60%** higher than current usage
- Long-term growth is mostly due to electrification assumptions (i.e., EV and heat pump adoption)
- Energy efficiency and higher-density housing offsets much of the growth driven by population and employment





Stakeholder Engagement and Feedback

Sustainability Plan

Throughout the development of the Sustainability Plan, BEC's was active in engaging with stakeholder groups. Stakeholder activities included:

1. **City of Burlington:** Coordinating with City of Burlington's staff to ensure alignment with scenario development.
2. **Burlington Climate Action Stakeholder Team:** Delivered a presentation to BCAC team members and solicited their feedback.
 1. Provided guidance on key assumptions for the Climate Action Scenario and confirmed growing momentum for EV and heat pump adoption through feedback and initiatives like Better Homes Burlington.
3. **Industry Experts:** Engaging with electricity sector representatives to receive feedback on climate action and impacts to the distribution sector.
 1. Identified challenges such as data tracking, education needs, collaboration opportunities, non-wires solutions, and climate resilience, which informed BEC's action items and role in climate action.
4. **Resident Feedback:** Conducted a survey with the community to solicit feedback and determine their priorities, and held a public webinar on April 25, 2024.
 1. Highlighted the importance of climate action and clean energy, with common initiatives being smart thermostat installation and EV purchases; main barriers included cost, lack of information, and complex requirements; priorities were maintaining system reliability, enabling renewables, electrification, and energy efficiency.



Distribution System Climate Risk

Sustainability Plan

- Climate projections are extremely uncertain
 - Future emissions are dependent on numerous assumptions including population growth and the effectiveness of climate mitigation activities
 - The effect of climate change on weather outcomes is not fully understood; models are particularly uncertain on the risk of low-probability events like extreme high winds
- Common findings for electricity distributors:
 - Increased risk of extreme heat impacting outdoor workers, customer electricity consumption, transformer/cable ratings, utility-owned facilities, sensor accuracy, and battery lifespan
- Increased risk of extreme rainfall and flooding impacting underground infrastructure and backup generators
- Minimal change in the frequency and risk associated with high-wind events and ice accumulation events are expected in the future; however, these risks are significant today

“Relative to the body of literature for variables such as temperature and precipitation, much less attention has been paid to wind extremes and hence, overall uncertainty about historical trends and future changes is also higher”

- Environment and Climate Change Canada, Climate-Resilient Buildings and Core Public Infrastructure



Distribution System Climate Risk

Sustainability Plan

Over the last 10 years, BEC, in addition to other Ontario LDCs, has been experiencing the impacts of climate change on its distribution system including increased incidence of extreme weather events which have negatively impacted reliability.

Number of Outages from Adverse Weather/Environment/Tree Contact Events in BEC's Service Area

