

CITY COUNCIL AGENDA TOPIC

Electric Grid Capacity Study Overview and Future Implementation

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EXECUTIVE SUMMARY**INFORMATION
ONLY**

Staff are providing an overview of the recently completed Grid Capacity Study, which provides an assessment of the local electric grid's ability to accommodate future population and employment growth while accounting for increasing building and transportation electrification. Tonight's meeting will focus on a review of the study and its recommendations for future implementation.

RECOMMENDATION

No action is being sought at tonight's meeting. At a subsequent meeting, council will be asked to provide direction for implementing the study and its recommendations.

BACKGROUND/ANALYSIS

In the 2025-2026 budget, council included funding to support an energy capacity needs and gap analysis (Grid Capacity Study). The impetus for the study is the growth targets outlined in the 2024 Comprehensive Plan as Bellevue is planning for 35,000 housing units and 70,000 jobs to be added by 2044, along with Bellevue's goals to reduce greenhouse gas emissions.

State and local decarbonization policies, plans, and regulations, such as Washington's Climate Commitment Act (CCA), directly accelerate the adoption of electric vehicles (EVs), electric heating, and cleaner industry processes, shifting more energy use on the electric grid and driving significant growth in electricity demand. Based on current policy trajectories, transportation and building electrification – including new construction driven by growth and the electrification of existing buildings – could increase total electricity demand in Bellevue by roughly 75% by 2050.

The 2026-2030 Sustainable Bellevue Plan establishes priority strategies to electrify buildings, increase building energy efficiency, and transition to renewable electricity. These strategies support the Sustainable Bellevue Plan's overarching goal to reduce citywide greenhouse gas emissions, supporting the implementation of the target of a 95% reduction by 2050 compared to a 2011 baseline per Bellevue's Comprehensive Plan.

The Comprehensive Plan's Utilities Element provides policy support for coordination and partnership with non-city utility providers, such as Puget Sound Energy (PSE), to ensure timely planning and investments to serve future needs.

Electric Grid Capacity Study: Purpose and Scope

The study is an independent, consultant-led assessment of the local electric grid's ability to serve current needs and whether the grid is planned to provide enough electricity in the future, considering Bellevue's continued growth and electrification. The study focuses on the capacity of the local distribution network at the substation-level and does not evaluate the broader transmission network beyond the substations or generation resources, which support demand for PSE's entire service territory.

Bellevue and the City of Redmond have partnered on this study as both cities have common research goals and timelines for the assessment. The cities also have shared substations and other grid infrastructure. Through this partnership, and funding contribution from Redmond, staff sought to create economies of scale and increase the available budget for a more robust study. Staff also participated in technical assistance programs, run by Washington State Department of Commerce and U.S. Department of Energy, to access supplemental technical expertise and connect with additional resources to support this work.

The study (included as Attachment A) combines technical grid capacity analysis with insights gathered through a series of collaborative workshops between city staff and PSE facilitated by an outside consultant. Together, these efforts provide both a quantitative assessment of current and future grid conditions and a qualitative perspective on the planning, coordination, and implementation challenges associated with rapid growth and electrification.

Collaboration with PSE

Staff have engaged PSE over the course of the study to develop the project scope, share data inputs and planning assumptions, and participate together in the project's workshop series, which was designed to strengthen coordination and shared understanding between city staff and PSE. The report reflects the close collaboration between Bellevue, Redmond, and PSE.

The study's technical grid capacity analysis is based on a comparison between a city forecast – which was developed as part of the study and reflective of Bellevue and Redmond's goals and policies around growth and electrification as the cities do not forecast electric demand directly – and PSE's most recent electric demand forecast. This comparison helps identify and understand the differences between city and PSE demand forecasts. Bellevue plans around community-wide growth, local policies, and adopted climate and electrification targets, while PSE's long-term assumptions are developed at a regional scale to support system-wide utility planning and to meet applicable state laws and clean energy requirements.

These differing approaches, one rooted in policy-driven growth targets and land use planning, and the other in observed system performance and econometric forecasting, can lead to gaps in how emerging demand is identified and timed. For example, in developing long-term planning assumptions, Bellevue assumes a higher level of electrification in buildings and faster EV adoption than is reflected in PSE's baseline forecast. By planning together, both Bellevue and PSE can ensure that future development is supported by a resilient, reliable, and increasingly clean electric grid.

Grid Capacity Assessment Findings

The study examines load changes at the substation level as planned growth and electrification impacts vary across Bellevue. By comparing projected future demand to maximum substation load limits for the

winter and summer peaks, the study identifies where and when substations may face constraints. PSE's planned substation capacity upgrades are integrated into the analysis to provide a more realistic picture of future capacity. The analysis shows that the projected increase in total electricity demand directly affects both current and planned substation capacity.

The study finds that PSE substations are anticipated to have enough capacity with planned infrastructure improvements to serve the expected needs of Bellevue over the next ten years. Actual growth may differ from these assumptions, particularly if high intensity uses such as data centers, industrial facilities, or other large load projects occur. As a result, areas identified as having available capacity may still experience utilization constraints if unanticipated high-demand development materializes, reinforcing the need for proactive grid planning to support the city's long-term growth and sustainability objectives. For example, implementing demand-side management strategies – such as energy efficiency programs, managed EV charging, and flexible load programs – and Distributed Energy Resources (DERs), including rooftop solar and battery storage, can reduce peak demand.

The substation analysis further finds that the Clyde Hill, North Bellevue, Northrup, and Somerset substations are the most likely to experience capacity pressures in the near term (i.e., 2035), suggesting they may require closer monitoring and potential upgrades sooner than other substations. These substations generally serve areas where most of the city's planned growth will be directed, specifically Downtown, BelRed and Wilburton. These areas are identified as Mixed Use Centers in Bellevue's Comprehensive Plan and are served by a full range of transportation options, major commercial centers and the focus of future residential growth. Projected load growth in these areas is amplified by the assumption that new construction will have electrified heating, reflective of state electrification and clean building policies such as the CCA and Clean Buildings Performance Standard.

Addressing these emerging capacity constraints as well as the timely implementation of near-term planned improvements will require strong collaboration and coordination among the City, PSE, and regional permitting agencies. Substation upgrades often involve lengthy planning horizons, multi-year construction windows, and complex permitting and siting processes. Early coordination around permitting, land use considerations, and long-term development patterns is especially important for substations with limited existing capacity, ensuring that infrastructure investment keeps pace with community growth and the accelerating shift toward electrification. During the study process, PSE expressed a strong interest in identifying opportunities for permit process improvements to reduce barriers and timelines for electric grid infrastructure project permitting and delivery.

Sensitivities Analysis

To better understand how uncertainty in future growth and technology adoption could influence electricity demand, a sensitivity analysis was conducted as part of the study. Changes in key assumptions (population growth, electric vehicle adoption and building electrification rates) were combined to analyze a low-growth and high-growth scenario.

The analysis finds that these changes often do not have significant impact on substation loading. There are three substations (Clyde Hill, Northrup, and Somerset), out of a total of 23 substations serving Bellevue, where the combined impact of these sensitivities could be the difference between needing to plan for upgrades and not. This finding further confirms the need to regularly revisit growth assumptions as demographic trends, development patterns, and policy conditions continue to evolve.

Proposed Action Items for Implementation

The study's engagement component was designed to strengthen coordination, improve joint planning, and create a shared understanding among staff from both cities and PSE. The engagement objectives included developing a common view of regional growth and electrification goals and plans, establishing alignment on how electric demand is forecasted and planned for, and clarifying roles and responsibilities related to demand forecasting and long-term grid planning. Facilitated by an independent consultant, a series of workshops took place between January and May this year.

A complete overview of the workshops including key takeaways and recommendations to strengthen coordination, improve information sharing, and support more aligned long-range planning for Bellevue's energy needs can be found in the study.

Reflective of the technical capacity analysis and building on the workshops and earlier relationship building efforts, city staff and PSE worked together to confirm alignment of priorities and identify potential action items for implementation in the last workshop. The action items listed below support attaining the overarching goal of the city working together with PSE to ensure adequate grid capacity is available consistent with growth plans and in advance of planned development.

- Initiate a semi-annual joint forecasting session with PSE to review large load requests and in-flight projects and coordinate planning for block loads.
- Identify high-priority grid projects for permitting and select one as a pilot project to help identify continuous improvements to permitting processes.
- Collaborate with PSE on implementing demand-side management strategies (e.g., managed charging and flexible load programs) to reduce peak demand by kicking off a pilot project in a constrained area, achieving concrete enrollment and peak-reduction targets.
- Improve communications around grid capacity planning and investments to instill greater confidence in long-range planning efforts.

POLICY & FISCAL IMPACTS

Policy Impact

The Grid Capacity Study was developed to implement policy LU-7 in the Comprehensive Plan's Land Use Element: *Accommodate adopted growth targets of 35,000 additional housing units and 70,000 additional jobs for the 2019-2044 period and plan for the additional growth anticipated by 2044.*

This work is additionally supported by the following Comprehensive Plan policies:

UT-44. Coordinate with non-city utility providers to ensure planning for system growth consistent with the city's Comprehensive Plan and growth forecasts.

UT-79. Update utility agreements, engage partnerships, and develop policy to encourage timely planning and investments to ensure sufficient grid capacity for electrification and decarbonization.

Fiscal Impact

The Grid Capacity Study outlines recommendations and potential next steps for council consideration. The study may be implemented through a combination of ongoing resources and a limited subset of

recommendations potentially requiring supplemental staff time and consultant support. Staff will continue to work with PSE regarding implementation details and potential funding sources as needed.

OPTIONS

N/A

ATTACHMENTS

A. Grid Capacity Study

AVAILABLE IN COUNCIL LIBRARY

N/A