

Eastside Customer Demand Forecast

Abstract

PSE's Energize Eastside project is based on a forecast of customer demand that is more than five years old and not reflective of current consumption trends. The forecast has not been adjusted for slowing population growth, warming winters, or increasing electrical efficiency. Neighboring utilities that serve Seattle and Tacoma have issued more recent forecasts that show declining demand. If PSE's forecast were updated, the need to build Energize Eastside would evaporate.

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1. PSE's Forecast

When PSE first announced its Energize Eastside project in late 2013, the company showed a forecast of Eastside electrical demand that predicted reliability problems after 2017. The “Eastside Needs Assessment Report” showed demand increasing from 646 MW in 2012 to 818 MW in 2026, an average annual rate of growth of 1.7% .¹

Two years later, the company revised its forecast. The “Supplemental Eastside Needs Assessment Report” increased urgency to build the project using the graph shown in Figure 1.²

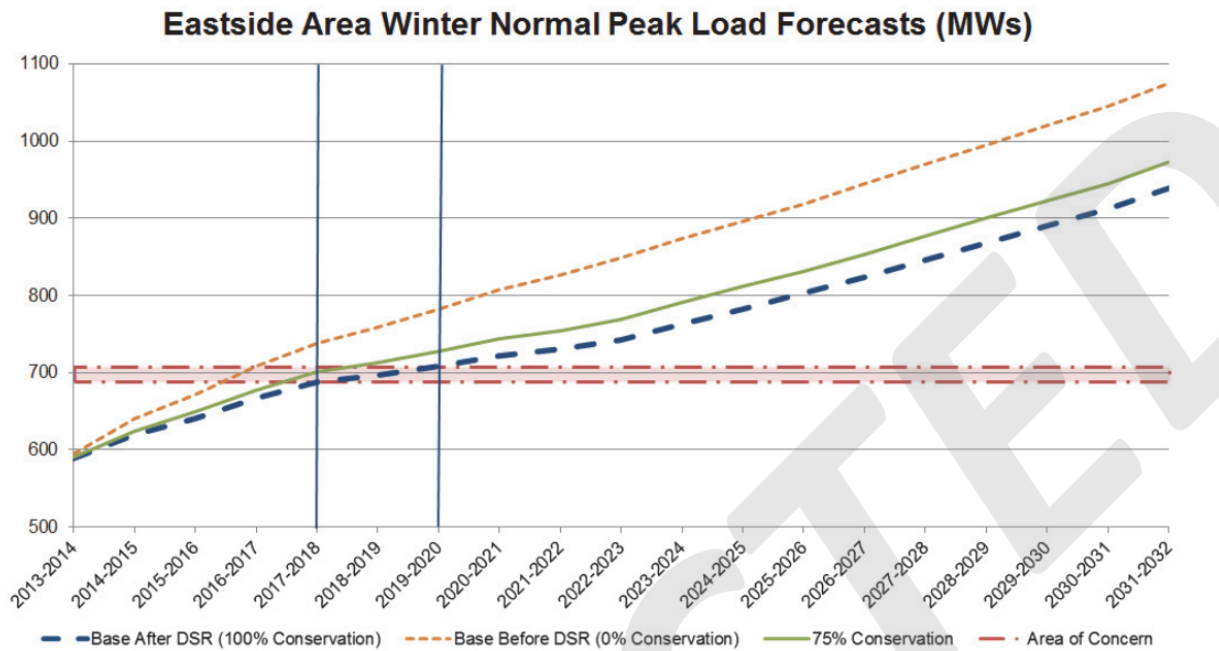


Figure 1 – PSE's 2015 forecast with “updated information”

The 2015 forecast shows demand increasing from 590 MW in 2013 to 935 MW in 2031, an average compound growth rate of more than **2.4%**. The rate of growth increased dramatically in just two years. What might explain such a significant revision?

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https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/Eastside_Needs_Assessment_Final_Draft_10-31-2013v2REDACTEDR1.pdf, pp. 31 and 76

2

https://energizeeastside2.blob.core.windows.net/media/Default/Library/Reports/SupplementalNeedsAssessmentReport_Redacted_April2015.pdf, p. 15

The supplemental report lists eight changes that have “substantial impact,” summarized here:

1. Updated facility ratings are “effectively **reducing** the overloads on facilities throughout the PSE system.”
2. “Seattle City Light Load Levels **Decreased**.”
3. “Peak demand and energy consumption were **reduced** by a forecast amount of conservation based on conservation target determined as optimal from the 2013 Integrated Resource Plan (IRP).”
4. “The 2012 load forecast assumed faster recovery of the US economy from the recession than the 2014 load forecast.”
5. “The 2014 load forecast used updated US population growth forecast from the US Bureau of Census, which is **lower** compared to what was used in the 2012 load forecast.”
6. “Because of slower housing recovery, customer growth and customer counts in the 2014 load forecast are **lower** than the 2012 load forecast.”
7. “Peak load growth and peak load levels for the system and for King County are projected to be **lower** in the 2014 load forecast as compared to the 2012 load forecast.”
8. “Based on PSRC’s population and employment growth forecasts, Eastside peak loads in the 2014 load forecast are projected to grow by 2.4% per year in the next 10 years, which is driven by growth in the commercial sector and high density residential sector. Also, updates to block loads over the study period influenced the load growth in the Eastside area.”

Seven of the eight updates would lead to a lower annual growth rate or greater system capacity than the 2012 forecast. Only the final update might justify higher growth, but it’s hard to understand how this factor alone increases the growth rate from 1.7% to 2.4% for the period shown in the forecast. The report does not contain any details about the block loads mentioned in this report.

2. Population Growth

Of the factors that drive demand for electricity, population growth is the easiest for the public to understand. PSE frequently mentions rapid growth on the Eastside as a primary reason for needing to upgrade the transmission system. According to population figures published by Google and the Puget Sound Regional Council (PSRC), the Eastside grew at an annual rate of 2.2% during the ten year period between 2005 and 2015. By this measure, PSE’s forecast of 2.4% demand growth might seem reasonable.

However, the PSRC forecasts slowing growth during the next two decades.³ For example, Bellevue grew by 1.9% per year from 2005 to 2015. During the next decade, PSRC predicts that pace will fall to 1.1%, and

³ https://www.psrc.org/sites/default/files/landusevision2_final_0.xlsx

0.6% in the decade after that. The graph shown in Figure 2 shows historical growth and PSRC's forecasts for four Eastside cities, the Eastside as a whole, and Seattle for comparison:

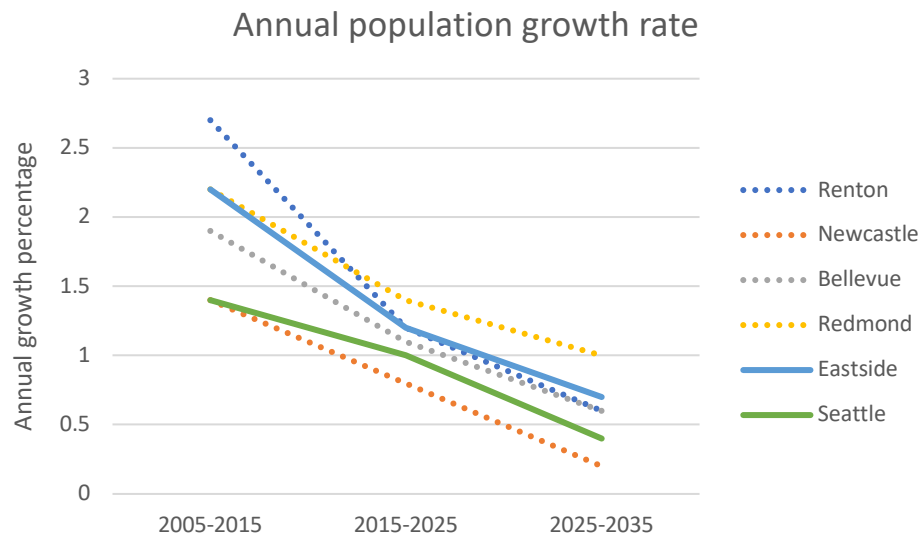


Figure 2 – *Historical and projected population growth rates*

If one simply assumes that electrical demand will follow population growth, slowing growth will delay the need for Energize Eastside. The blue line in Figure 3 shows electrical demand increasing at the same rate as the forecast for Eastside population growth. This line doesn't cross PSE's "Area of Concern" until 2024-2025 at the earliest:

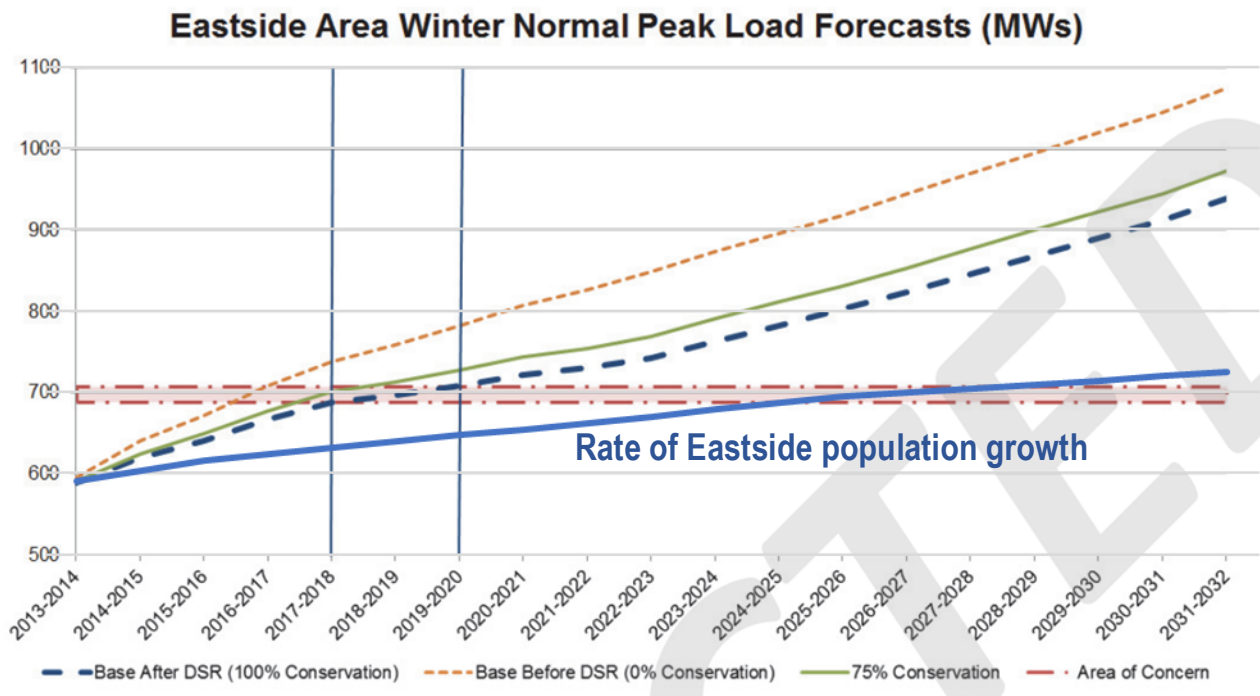


Figure 3 – Adjusted for projected population growth

3. Other Factors that Affect Demand

Demand for electricity is not driven solely by population growth. As a “winter peaking” utility, PSE’s highest loads occur when very cold temperatures persist in the Puget Sound region over multiple days. A good example is the 3-week cold snap that afflicted Northwest Washington in February 2019. According to a real-time website run by the Bonneville Power Administration, demand for electricity in the Puget Sound was more than 20% higher at 13 degrees than it had been a week earlier at 36 degrees.

Members of PSE’s Technical Advisory Group have complained for years that PSE is not correctly accounting and planning for the effects of climate change. Using data provided by PSE, Figure 4 shows the lowest temperatures that have occurred each year over a 30 year period. If one averages the highly variable data in 5-year chunks, it is apparent that low temperatures are rising by approximately one degree every 5 years. This phenomenon will lessen winter loads over time.

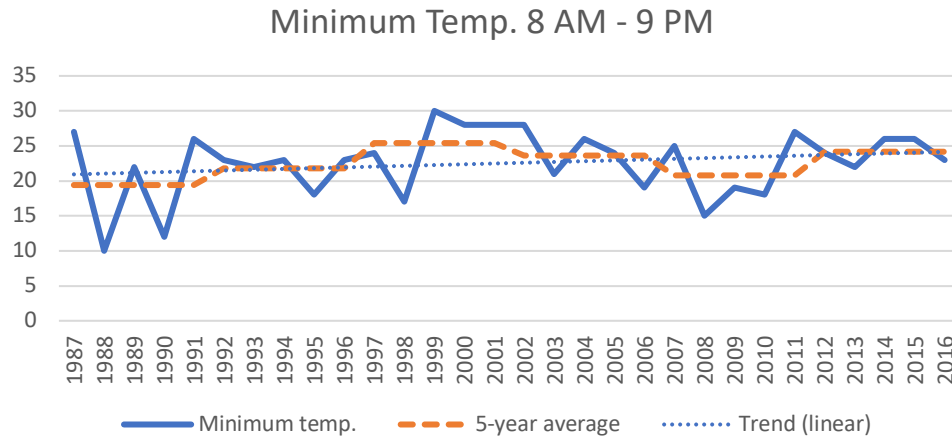


Figure 4 – Minimum temperatures for past 30 years

The increasing efficiency of computers, smartphones, smart thermostats, and appliances also has a big impact on electrical demand. PSE tries to justify Energize Eastside in its public presentations by asking people to think about all the new devices they are using that weren't available ten years ago. However, the public may not realize how much more efficient these new devices are. For example, if you spend just four hours writing documents and responding to emails on a desktop computer, you consume enough electricity to power a smartphone for an entire year. The more we use smartphones to accomplish our digital tasks, the more electricity we save compared to using a desktop.

Seattle city staff member Tony Kilduff explained why electricity use has been falling in Seattle for years:

*"All of the things we are seeing on the horizon are indicating that there is likely to be even less demand at the retail level for energy," Kilduff said. "We have ongoing improvements in energy efficiency components, not just LEDs; solar panels have become more cost effective because of all the subsidies provided for them, they are also becoming more efficient. And as battery technology has been improving, this is leading to the likelihood there will be less and less retail demand."*⁴

Seattle's utility, Seattle City Light, has been trying to adjust its forecasts to account for decreasing demand for years. Seattle Business Magazine published the graph shown in figure 5, showing lower and lower forecasts over a five year period, as actual demand continued to decline.⁵

⁴ <http://mynorthwest.com/647139/seattle-city-light-lost-revenue>

⁵ <http://www.seattlebusinessmag.com/policy/how-climate-change-conservation-and-renewable-energy-are-changing-seattle-city-light>

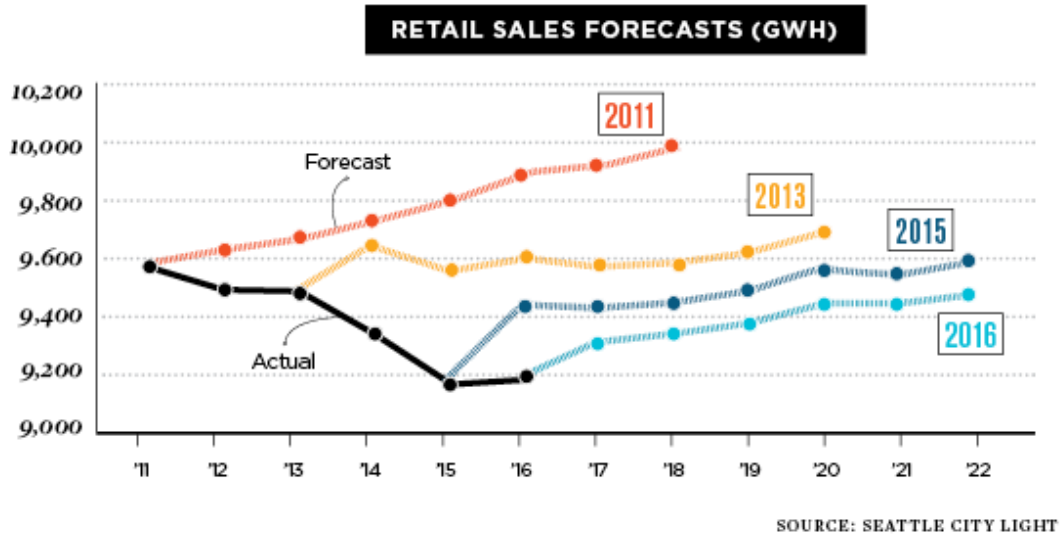


Figure 5 – Seattle City Light lowers demand forecasts

PSE has not followed Seattle's lead. In fact, if the 2.4% rate of growth anticipated in PSE's 2015 forecast is superimposed on Seattle's graph, the stark contrast in the rates of growth becomes clear:

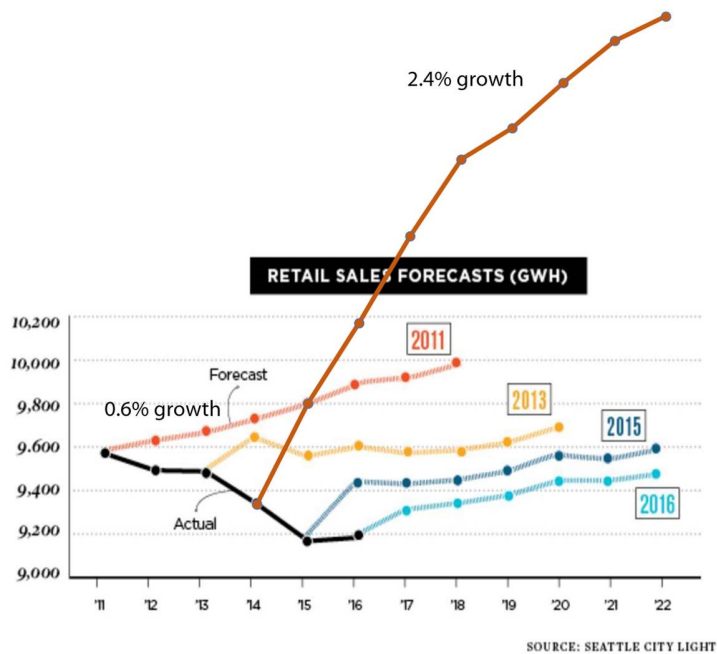


Figure 6 – Energize Eastside forecast compared

After years of forecasts headed the wrong direction, Seattle City Light has finally come to terms with declining consumption. In its latest Integrated Resource Plan Progress Report, the utility forecasts falling peak demand and average consumption:⁶

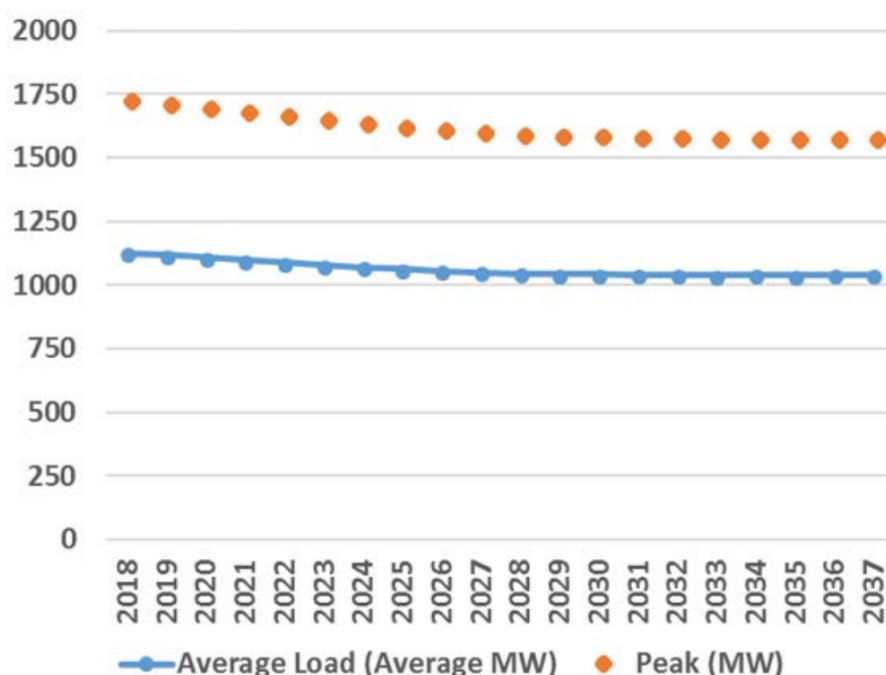


Figure 7 – Seattle City Light’s latest peak and load forecast

Here is Seattle City Light’s explanation of this forecast:

City Light’s long-range forecast calls for retail load to decrease despite the projected economic and population growth for the region. Growth is declining because of changing regulations, building codes, and new customer behaviors. This is similar to regional and national trends.

Seattle documents declining consumption in both the residential and commercial sectors, indicating that gains in efficiency are overwhelming growth in population and the economy.

The utility that serves customers in Tacoma, Washington forecasts not only declining demand, but finds that conservation is the most cost-effective resource for meeting future energy needs:⁷

⁶ http://www.seattle.gov/light/IRP/docs/2018_Integrated_Resource_Plan_Progress_Report.pdf

⁷ https://www.mytpu.org/file_viewer.aspx?id=64779

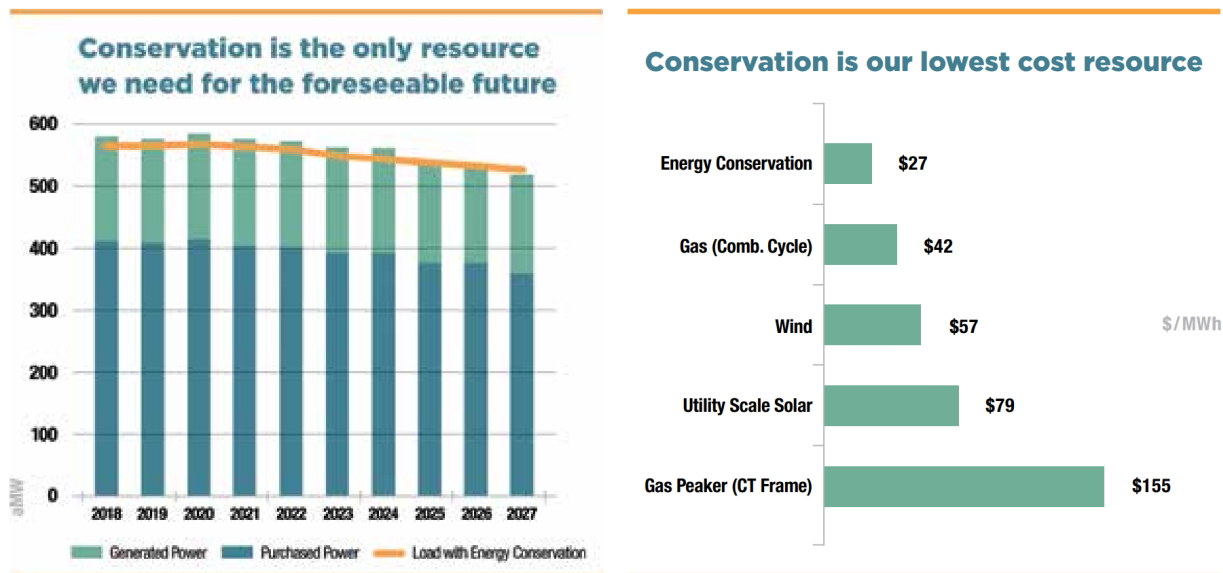


Figure 8 – Tacoma Power shows lower electricity consumption and benefits of conservation

Tacoma’s reliance on conservation aligns with the conclusions of the Northwest Power and Conservation Council’s “Seventh Power Plan,” which finds energy efficiency and conservation to be the best resources to serve the Northwest’s energy needs in coming decades: “Using modeling to test how well different resources would perform under a wide range of future conditions, energy efficiency consistently proved the least expensive and least economically risky resource.”⁸

Although Tacoma and the Conservation Council refer to energy generation resources, the same principles apply to a transmission line. If peak demand for electricity can be mitigated through efficiency and conservation, ratepayers will save money through lower energy bills. However, a profit-driven corporation like PSE does not have incentives to lower electricity consumption. PSE dismisses the potential for conservation on the Energize Eastside website: “Despite these aggressive conservation efforts, studies show demand is dramatically outpacing supply. Conservation alone is not enough to keep up with our region’s growth. PSE works hard to encourage our customers to conserve electricity. However, our conservation programs are voluntary – it’s the customer’s choice to make a change. Our Eastside economy and population are growing far faster than our conservation efforts can keep up.”⁹

In 2016, PSE contradicted these statements about runaway consumption in a promotional video featuring the company’s vice president, Andy Wappler.¹⁰ The video shows a Nest-branded smart thermostat, at the same time Mr. Wappler says, “While new technologies and significant conservation have **reduced energy consumption**, these lines need to be replaced. The upgraded lines will be built to the highest safety standards...”

⁸ https://www.nwcouncil.org/sites/default/files/7thplanfinal_chap01_execsummary_6.pdf

⁹ <https://energizeeastside.com/faqs>

¹⁰ <https://youtu.be/ryNAEqSUV8>

Mr. Wappler's admission refuted years of PSE claims about ever-rising energy consumption. Instead, he made a new argument for the project. He says the lines are old and due for replacement. If PSE wishes to *replace* existing lines with newer lines, that would not be controversial. But an *upgrade* that doubles the line voltage requires thousands of trees to be removed and taller poles to be installed to achieve mandatory safety clearances. PSE has not shown why this upgrade is necessary in an era of "reduced energy consumption."

4. *Evolution of PSE Forecasts*

In 2013, the same year Energize Eastside was unveiled to the public, PSE submitted an Integrated Resource Plan that anticipated electricity demand growing at an average rate of 1.08% per year for the following 10 years. By 2017, the same planning document had lowered the 10-year forecast to only 0.13% per year, a nearly 10-fold drop in the rate of growth in only four years. It's clear that something big is happening. But when PSE revised its Eastside forecast in 2015, the growth rate jumped 41%, from 1.7% to 2.4%. The local forecast dramatically diverged from the corporate forecast trend without any credible explanation.

CENSE repeatedly asked PSE to disclose several years of peak demand records for Eastside substations. This would allow the public to see where growth is occurring, and at what rate. In fact, this information is required by Bellevue Land Use Code 20.20.255.D.1, which states, "At least one of the alternative sites identified by the applicant shall be located in the **land use district to be primarily served** by the proposed electrical utility facility." CENSE asserts that alternatives cannot be properly evaluated without documenting which districts are primarily served by the proposed electrical infrastructure.

5. *Conclusion*

Energize Eastside is a big, costly project based on outdated forecasts that have proven to be inaccurate. Before permitting a project that will negatively affect ratepayers, property owners, and natural resources, city officials and regulators should take extra care to ensure the project is based on accurate and up-to-date analysis and data.