EXH. DJL-4 (Apdx. B)
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: DAVID J. LANDERS

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

APPENDIX B (NONCONFIDENTIAL) TO THE THIRD EXHIBIT TO THE PREFILED DIRECT TESTIMONY OF

DAVID J. LANDERS

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024

PUGET SOUND ENERGY

Grid Modernization: Targeted Capacity Upgrades

Corporate Spending Authorization (CSA)

Date Created:	Friday, February 10, 2023
Discretionary/ Non-Discretionary:	Discretionary
Multi Year Rate Plan:	Programmatic
Equity Impact:	Yes
Strategic Alignment:	Operate the Business-Customer Experience
Estimated In-Service Date:	Sunday, December 31, 2028
Current State (Business Need):	Growing loads due to customer additions, electrification, large loads such as light rail and EV public charging plans, and future DER demands require distribution system upgrades to enable and ensure there is adequate capacity under all conditions to provide reliable service. Conductor and equipment ratings must be monitored for summer and winter adequacy and be addressed to prevent loss of life as well as phase imbalance, low-voltage, limited switching availability, and cold load pick up concerns. Circuits that are or are predicted to be over 85% utilization during peak are reviewed for remediation.

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Desired State (Proposed Solution):	The program will address about 7% of the 1100 circuits between 2022-2026 based on high system utilization. The program attempts to prioritize the greatest need based on historical funding and resources. Upgrades include larger conductor, feeder ties, or potentially expanded substation work. Solutions will also address reliability concerns where needed, installing covered conductor, replacing aging assets, undergrounding, adding automation, vegetation management, and bird/animal guards. However, electrification pace may drive more focus on this program which is yet to be fully evaluated. Alternatives account for conservation and then further consider demand response and screen for DER potential. Program specific projects are scoped 3-4 years before need.

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Outcome/Results (What are the anticipated benefits):	Between 2022-2026, 76 circuits will be upgraded to meet X MW of growth and ensure reliable energy delivery.

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Dependencies: Yes

Dependencies comment: Customer requested work leverages system improvements that are planned.

Escalation Included: No, escalation has not been included.

Total Estimated Costs: $52,100,000

Estimated Five Year Allocation:

Funds Type	ID	Line Item Description	Previous Years Actuals	Fiscal 2024 Requested	Fiscal 2025 Requested	Fiscal 2026 Requested	Fiscal 2027 Requested	Fiscal 2028 Requested
Capital	W_R.10009.07.01.01	E OH System Capacity New Dist	$ -	$ 23,309,000	$ 23,000,000	$ 18,175,000	$ 31,500,000	$ 32,150,000

Incremental O&M: Both

Qualitative Benefits:

The main drivers for this program are to support growing load, provide operational flexibility and overall improve the customer experience. The primary benefit of this program is avoiding unserved energy due to insufficient capacity and resulting outages. This equates to loss of revenue as well as avoided outages and CMI.

Quantitative Benefits:

Quantitative Benefits	Benefit Type	Previous Years	Fiscal 2024	Fiscal 2025	Fiscal 2026	Fiscal 2027	Fiscal 2028	Fiscal 2029	Remaining Costs	Life Total
Unserved Energy	Other	$ -	$ 69,800,000	$ 69,800,000	$ 69,800,000	$ 69,800,000	$ 69,800,000	$ -	$ -	$ 349,000,000

Risk Summary:

Project risks include permitting challenges and resources primarily.

Benefit risks arise if load is not realized but planning process addresses known near term growth. Projects deferred if load assumptions change.

System risks arise in the form of reliability concerns if infrastructure cannot meet load. Intention load reduction would be necessary.

Because this work intends on addressing future load, it is susceptible to deferral in lieu of addressing present concerns. As a result, project timelines are shortened, and system risk develops.

PUGET SOUND ENERGY

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Change Summary:

Planning Cycle	Change Summary	Last Update Date
2022 Baseline Cycle	This CSA has been migrated into the EPPM tool at go-live as part of the Phase 1 EPPM implementation effort. The projects in this CSA were previously approved for the 2023-2027 capital plan. Please refer to the original CSA document for additional information (if available.)	2/10/2023
2023 Cycle 1	Update from current business plan information	3/15/2023

PUGET SOUND ENERGY

Grid Modernization: Targeted Capacity Upgrades

Corporate Spending Authorization (CSA)

Approval History:

Approved By	Date Approved
Approved by Cost Center Owner: Lambert , Ryan	3/30/2023
Approved by Cost Center Owner: Lambert , Ryan	4/3/2023
Approved by Director Sponsor: Landers , David	4/6/2023
Approved by Executive Sponsor: Jacobs , Josh	4/8/2023
CSA Status changed to Approved	4/8/2023
Approved by Cost Center Owner: Shrum , Bailey	12/4/2023
Approved by Director Sponsor: Shrum , Bailey	12/4/2023
Approved by Executive Sponsor: Shrum , Bailey	12/4/2023
CSA Status changed to Approved	12/4/2023
Approved by Cost Center Owner: Lambert , Ryan	1/29/2024
Approved by Director Sponsor: Landers , David	1/29/2024
Approved by Executive Sponsor: Jacobs , Josh	2/2/2024
CSA Status changed to Approved	2/2/2024

TARGETED CAPACITY UPGRADES

ENERGY TYPE: ELECTRIC

1. SHORT DESCRIPTION

This plan supports distribution electric capacity needs that have been evaluated using project benefits and achieve positive benefit-cost ratios.

2. BACKGROUND

The Clean Energy Transformation Act (CETA) signed into law in 2019 has paved the way for statewide efforts to allow Washington residents and businesses to power their buildings and homes, vehicles, and appliances with carbon free resources, such as wind and solar. As utilities make investments to ensure electricity supplied by the grid becomes carbon free as required by CETA, customer loads are increasing due to increased EV charging, transition to greater use of electricity for space and water heating due to changes in energy codes, and continuing development in the region.

In addition, recent years have brought increased load growth in targeted areas due to infrastructure improvements. For example, areas near the new light rail system are seeing explosive growth and new developments, driving loading of certain circuits beyond criteria outlined in Puget Sound Energy's (PSE) Distribution Planning Guidelines. These developments require additional capacity to support new load and maintain reliability in these rapidly growing areas.

To meet these evolving demands, PSE Planners must ensure that future load additions do not exceed the load limits of the conductor and equipment installed on the system, keeping in mind typical timeframes for the implementation of the possible solution strategies. Concurrently, they must also ensure that capacity related investments are prudent and cost-effective. Exceeding conductor and equipment ratings is the main reason for proposing capacity modifications on the distribution system. Other system conditions like phase imbalance, power quality, cold-load pickup, and operational flexibility are also reasons for capacity modifications.

PSE Planners perform adequacy screenings using winter and summer distribution substation and feeder peak load data. This screening can trigger a high-level capacity assessment which evaluates whether there will be sufficient distribution system capacity per capacity limits outlined in the Distribution Planning Guidelines. Projects are scoped with a planning horizon to allow a sufficient window of time to design, permit, obtain easements, and build the project in time to serve the growing load, with more-complex substation projects taking longer to develop and construct. These assessments include general localized growth assumptions based on PSE's county-level forecasts, augmented by block load additions. Other triggers for a high-level capacity assessment could be any of the following:

- Awareness of a new potential block load or major development,

• Review requests including design load approvals, public improvement, major account and new business opportunity, generation interconnection, and
• Operations concerns, such as phase imbalance, cold-load pickup, limited switching available, and ability to hold peak load.

If the high-level capacity assessment confirms a capacity need, a formalized Distribution Capacity Study is performed which can result in a Targeted Capacity project.

Annually, Planning evaluates circuit performance at a system level and identifies circuits that surpass criteria outlined in the Distribution Planning Guidelines. The table below shows that the number of circuits requiring a high-level capacity assessment has increased between 2018 and 2022, for both Winter and Summer seasons, where 85% feeder utilization is the Distribution Planning Guideline minimum criteria for conducting a needs assessment.

Table 1: Number of Circuits Triggered for Planning Study, Winter Peak

Season	Year	Circuits over 85%* utilization
Winter	2018	41
	2020	25
	2022	55

Table 2: Number of Circuits Triggered for Planning Study, Summer Peak

Season	Year	Circuits over 85%* utilization
Summer	2018	20
	2020	13
	2022	41

The temporary decrease in 2020 correlates to impacts from the pandemic during which customer energy usage changed dramatically.

The increase in circuits identified between 2018 and 2022 shows the need to address capacity immediately and proactively to ensure a grid that is highly reliable and can continually accommodate our future customers' growing needs.

3. STATEMENT OF NEED

This plan targets the improvement of system capacity to meet the continued load growth seen by increasing and evolving customer demands. This plan targets solutions to allow adequate capacity that directly affect system reliability and operational flexibility and allows future customers to be safely and quickly energized.

3.1. Need Drivers

- **Capacity** – System upgrades support capacity needs in our system by upgrading laterals and adding new feeder capabilities to serve growing load.
- **Power Quality** - System upgrades support solving voltage needs in our system by addressing abnormal voltage and power factor across the system.
- **Grid Modernization –**
    - **Reliable** – Improving capacity concerns will allow for a more reliable system to provide operations personnel with the ability to restore customers quickly.
    - **Resiliency –** System upgrades improve the ability of the electric system to withstand and recover from a major disruption, such as storm events, natural disasters, deliberate attacks, or accidents.
    - **Smart & Flexible** – System upgrades support operational flexibility and improve telemetry capability to allow for integration of Distribution Automation and Grid Modernization plans.
    - **Safety** – System upgrades improve system capacity by upgrading conductors and equipment that can be considered a safety risk.

3.2. Equity

PSE evaluates equity in the planning process with consideration of the four core tenets of energy justice: Recognition Justice, Procedural Justice, Distributional Justice, and Restorative Justice in various steps of the process.

As specific studies are performed and projects proposed to further a business plan, planners review system, customers, and now equity data to recognize the specific customer burdens, whether there are highly impacted or vulnerable customers that are or will be affected by addressing the specific business need. Planners must prioritize where to focus study each year, thus the full understanding of the historic and ongoing inequities for the entire business plan is extrapolated, maturing over time which greater tools and data.

PSE is building process and tools to enable procedural inclusion in defining the need and solutions through engagement with specific communities and community-based organizations, increasing understanding of local needs and consequences to inform specific study development as well as options to address need. Maturity in where and how this occurs will increase over the next several years. Business plans will be updated as informed this collective engagement to reflect broader equity benefits and burdens as this engagement increases over time.

As specific projects are proposed, PSE investment decision optimization tool captures equity benefits. An optimized portfolio of projects across many business plans ensures the distribution of benefits and burdens are spread across all segments of the community and aim to ensure that marginalized and vulnerable communities do not receive an inordinate share of

burdens or are denied access to benefits. As an initial step, PSE leverages Customer Benefit Indicators ("CBI") and information established as part of the 2021 Clean Energy Implementation Plan ("CEIP") to identify an equity framework to evaluate system projects. The CBI approach was developed through an iterative process coordinated with the Equity Advisory Group. These CBI span the core tenets of energy justice and provide a framework to evaluate the comparative equity benefit of each solution alternative considered. Refer to Table 3 for a brief description of the CBIs that address equity and the applicable benefits for the Targeted Capacity program. PSE will continue to adjust and refine equity consideration in projects, when necessary, as the process continues to mature.

Projects will be evaluated on each CBI category and a total equity benefit score is provided.

Table 3: Equity Applicable Benefits

Customer Benefit Indicator	Description	Program Applicable Benefit
Customer Energy Savings	Solutions that lead customers to use less energy, which leads to less energy that must be purchased and potentially a reduction in planned system upgrades.	No
Greenhouse Gas Emissions	Solutions that lead to a reduction of greenhouse gas emissions, either directly or indirectly	No
Enables Cleaner Energy	Solutions that either directly integrate DER on the system or enable the grid to accommodate future DER more readily	Yes
Air Quality	Solutions that either directly eliminate the source of a common pollutant or reduce the risk that could cause a common pollutant to increase, such as enabling Electric Vehicle or DER adoption	Yes
Resilience	Solutions that address major event outages or harden critical facilities to prevent catastrophic events from creating long duration outages.	Yes
Cost Reduction	Solutions that identify least cost alternatives and therefore reduce costs for all customers	Yes
Clean Energy Jobs	Solutions that increase clean energy jobs by furthering clean energy technology application, as described in the CEIP	No
Home Comfort	Solutions that deploy residential energy efficiency in either a targeted solution area or by leveraging load reduction from system wide energy efficiency installations	No

The program attempts to annually address distribution electric capacity needs and is programmatically optimized based on total benefit value to cost. Specific program projects are identified based total benefit to cost with named communities receiving additional scored benefit based on vulnerable population designation and highly impact community characteristics, ensuring investments are distributed appropriately to named communities.

Business plans in isolation do not address restorative justice, but continued planning process improvements which include considerations of data, tools, and documentation as well as operational practices will help to restore equity over time.

4. PLAN DETAIL

4.1. PLAN SIZE/POPULATION

There is not a finite number of circuits to target. Instead, this plan addresses ongoing, emerging capacity needs across PSE's entire population of roughly 1100 distribution load circuits. Based on past capacity projects, the future projects are estimated to impact 2% of distribution circuits annually.

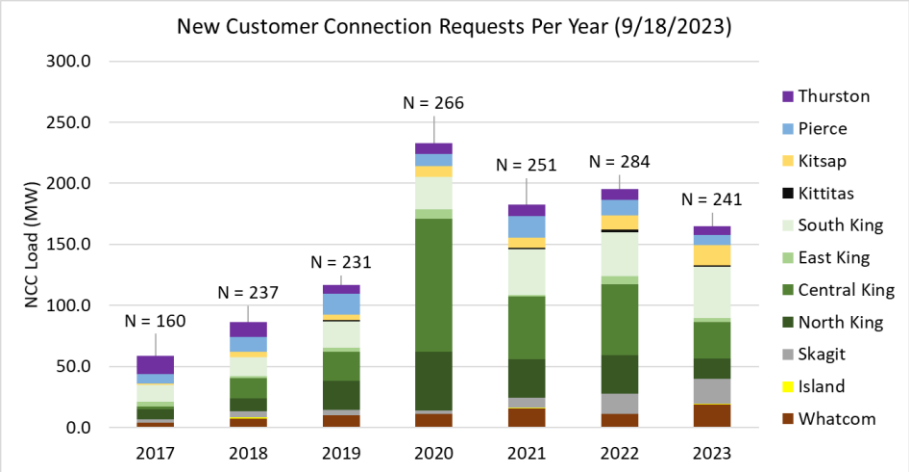
4.2. PROPOSED COMPLETION DATE

This program is ongoing and addresses emerging system needs. It is expected this program will go on indefinitely to account for the continual changes with system performance, physical plant, and customer needs which account for PSE's highest distribution capacity, voltage, and operational flexibility system needs.

4.3. SUMMARY OF PLAN BENEFITS

PSE's highest distribution capacity needs will be targeted with this plan, especially in response to the increasing quantity and load requests from customers. Figure 1 shows the annual count and increasing size of new customer requests.

Figure 1: New Customer Connections Requests, 2017-2023



4.4. Investment Decision Benefits

PSE employs an Investment Decision Optimization Tool (iDOT) to evaluate benefits of projects and optimize the annual portfolios for construction. The top primary iDOT benefits this plan addresses are:

- Expected Unserved Energy
- Energy Quality
- Flexibility
- Revenue Increase

Table 4: Summary of Plan Benefits, Population, and iDOT B/C Score

	Total Projects	Total Plan ($M)	Expected Unserved Energy (kWh)	iDOT B/C Score
2025-2026	28	$65.9	12,888,217	9.53

4.5. Estimated Costs

Estimated costs are generated based on historical costs of similar types of projects and allow for variations in project scope, increases in project cost due to inflation, and added contingency to account for unforeseen conditions associated with projects.

Costs vary widely and some circuits may need more improvements than others due to variability in the type of improvements required and local site conditions. For example, a specific project might require tree-wire re-conductor, pole replacements, adding reclosers, and partial underground conversion, while another may only require installing one device to balance loading and provide operational flexibility.

Due to the variation in capacity needs and solutions required, historical actual costs have varied per year over the life of this plan.

5. FUNDING ALTERNATIVES

5.1. SOLUTION ALTERNATIVES

No Action - There is a greater risk of customer dissatisfaction and loss of potential customers in areas with constrained loading capacity that are experiencing high load growth. In addition, customers may experience power quality issues if capacity needs are not addressed. There is also the lost opportunity to restore power to a variety of feeder and lateral outages without spare capacity to support operational flexibility.

5.2. FUNDING ALTERNATIVES

Increased Funding from proposed - With increased funding, the triggers for identifying customer's capacity issues would be expanded to accommodate the needs of more customers.

Decreased Funding from proposed - Decreased funding would result in fewer circuits receiving overall system improvements in the near term. There is also increased customer dissatisfaction and loss of potential customers in areas with constrained loading capacity and high load growth.

6. PLAN DOCUMENT HISTORY

The current version of the project summary supersedes all previous versions.

Date	Reason(s) for Update	Summary of Significant Change(s)	Modified By
5/18/2020	Original Program Documentation	Initial Program Document	Karen Pavletich
4/2/2021	2021 Updates	Data updated to reflect most recent 5 Year Plan Dollars	Karen Pavletich
5/6/2021	2021 Updates	Statement of need updated to reflect impacts of electrification and meeting N-0 and N-1 recommendations. Data updated to reflect additional changes to the 5 Year Plan Dollars	Karen Pavletich
5/7/2021	OMRC Update	Budget plan reflects latest estimate from Project Management	Karen Pavletich
7/9/2021	Used and Useful Policy guidance	Updated to current information; add alternatives and cost information	Karen Pavletich
12/1/2021	Annual Review	Minor words and format changes	Karen Pavletich
09/26/2023	2024 MYRP update	Include equity, remove ISP, remove plan budgetary info, updated language in multiple sections	Yaochiem Chao
12/4/2023	2024 MYRP update	Updated Equity, Top 3 Primary iDOT categories, and Program Summary Table to align with 2025-2026 project submittals	Krista Malmgren

7. SUPPORTING DOCUMENTATION

Document Name
PSE DISTRIBUTION PLANNING GUIDELINES 2020