



B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

# 2025 Transmission Plan

Open Access Transmission Tariff  
Attachment K Planning Process

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## About this Transmission Plan

This BPA Transmission Plan (T-Plan) is produced in accordance with the requirements of BPA's Open Access Transmission Tariff Attachment K (Attachment K) Planning Process. The planning process is conducted in an open, coordinated, and transparent manner through a series of open planning meetings. The planning process occurs on an annual basis and results in a public posting of this Transmission Plan.

The planning process begins with BPA Transmission Planning conducting a comprehensive system assessment by performing detailed studies. The NERC Standard TPL-001-5.1 requires that BPA conduct an annual assessment to ensure that the BPA transmission system is planned to meet the required performance for the system conditions specified in the standard. The engineers use a power flow model of the transmission system. The objective of the system assessment is to test the reliability of the transmission system under a variety of system conditions to identify system deficiencies and develop corrective action plans where deficiencies are identified.

The Transmission Plan documents BPA's 2025 Annual System Assessment, ensuring compliance with NERC Planning Standard TPL-001-5.1. This standard mandates an annual assessment of BPA's transmission system to meet performance requirements across various system conditions. The plan outlines BPA's Transmission Planning processes and details proposed projects from its Annual Planning Assessment. The report is structured into

three main sections: the current transmission expansion scenario, process information, and service plan details, categorized by planning areas, paths, and interties.

# 1. State of Transmission Expansion

## 1.1 Transmission Expansion Drivers

Transmission Planning identifies expansion projects through four distinct processes: annual system assessment, customer requests for transmission service, customer requests for generator interconnection, and customer requests for line and load interconnection.

### 1.1.1 System Assessment

To ensure reliability, the annual assessment tests the transmission system under various system conditions. BPA plans the system for at least ten years, basing reinforcement needs on peak forecasted loads, growth, and existing long-term firm transmission service obligations. This planning adheres to North America Electric Reliability Corporation (NERC) Planning Standards and Western Electricity Coordinating Council (WECC) Regional Criterion.

### 1.1.2 Transmission Service Requests

Qualified customers may request long-term transmission service on BPA's transmission system. This service is requested through Transmission Service Requests (TSR) according to the terms of the BPA Open Access Transmission Tariff (OATT). TSRs are one of the drivers for system expansion projects. BPA manages these customer requests for transmission service through the Transmission Service Request and Expansion Process (TSEP). The TSEP process could be modified as part of BPA's Grid Access Transformation effort.

### 1.1.3 Generator Interconnection Service Requests

Qualified customers may request interconnection to BPA's system for interconnecting new generation. BPA receives Generator Interconnection Requests according to the Attachment L (Large Generator Interconnection Process) and Attachment N (Small Generator Interconnection Process) of the BPA OATT. In 2024, BPA Revised Attachment L to implement a new cluster study approach and added a new Attachment R (Large Generator Interconnection Transition Process) to implement the transition to the revised process.

### 1.1.4 Line and Load Interconnection Service Requests

Qualified customers may request new points of interconnection on BPA's transmission system. These Line or Load Interconnections (LLI) are typically for new load service or to allow the Customer to build or shift the delivery of service to different points on their system. This service is requested according to BPA's Line and Load Interconnection Procedures Business Practice.

## 1.2 Transmission Expansion Plans of Service

### 1.2.1 New System Assessment Annual Corrective Action Plans

BPA's 2025 System Assessment identified the following new corrective action plans (CAP):

- Aberdeen-Aberdeen Tap to Satsop Park-Cosmopolis #1 115 kV line upgrade in Southwest Washington Coast area - need date 2026
- Sno-King 230/115 KV Bank 3 PCB Bushings CTs upgrade in Northwest Washington Seattle Tacoma area - need date 2026
- Install a second Driscoll Under Voltage Load Shedding Relay in North Oregon Coast Area (WILSWA) - need date 2026
- Install a new Lebanon 300 MVA, 230/115 kV Transformer Bank in Salem / Albany area (SWOR)
- Upgrade Chemawa 230/115 kV transformer to 300 MVA, in Salem / Albany area (SWOR)
- Upgrade Santiam 500/230 kV Bank #4 230 kV PCB A542 and Associated Line Side Disconnect Switch in Salem / Albany area (SWOR)
- Ellensburg 115kV Shunt Capacitor Expansion in Mid-Columbia River Area (Northern)
- East Omak Shunt Capacitor Addition (21 MVAR) Okanogan Area (Northern)
- Sacajawea to Ice Harbor-Franklin #1 115 kV line addition (a new ½ mile line from Sacajawea to tap the Ice Harbor -Franklin 115 kV line) in Tri-Cities Area (Central)
- A new Bonanza 500/230 KV Substation in Central Oregon Area (includes Alturas Area) (Southern)
- Bonanza-La Pine 230 kV line addition Central Oregon Area (includes Alturas Area) (Southern)
- Warner 115 kV +/- 100 MVAR STATCOM Northern California Area (Southern)
- Columbia Falls 230/115 Transformer Bank 2 & 3 Replacement in Northwest Montana Area (Eastern)
- Rebuild Cattle Creek-Palisades and Palisades- Swan Valley 115 kV lines to 161 kV with additions of 161/115 kV transformers at Palisades and Swan Valley in Southeast Idaho / Northwest Wyoming Area (Idaho)
- Build a new 115 kV Targhee substation and remove 115 kV Targhee Tap, add an additional 16.5 MVAR shunt capacitor at Targhee, and reconductor the Targhee Swan Valley and Targhee-Drummond 115 kV lines in Southeast Idaho / Northwest Wyoming Area (Idaho.)
- At Teton 115 kV substation add a sectionalizing breaker and a new 12.6 MVAR shunt capacitor in Southeast Idaho / Northwest Wyoming Area (Idaho).
- Add Redundant Bus Differential Protection at Big Eddy 230 kV in Hood River/The Dalles Area (Lower Columbia)

The 2025 short circuit analysis highlighted the need to replace several underrated breakers due to insufficient fault duty capability. The plan involves upgrading these breakers with higher-rated equipment to maintain adequate short circuit capability throughout the planning horizon:

- McNary 115 kV Substation, Powerhouse #6/N.Wasco breaker, Lower Columbia Area
- Covington 230 kV Substation, Bus Section 1-2 breaker, Northwest Washington Seattle/Tacoma area
- Maple Valley 230 kV Substation, SVC/Bank3 Reactive breaker Northwest Washington Seattle/Tacoma area
- Keeler 230 kV Substation, Group 2 Reactive breaker Portland, WILSWA area

## 2. BPA Grid Expansion Reliability Portfolio (GERP)

BPA Transmission is aware that national and regional resource objectives, changing load and resource locations, electrification and other factors will impact the way it does business over the next two decades. BPA will approach this Grid Expansion Reliability Portfolio (GERP), by leveraging strategic partnerships and investments in transmission infrastructure. BPA Transmission Services seeks to optimize grid performance and support the Pacific Northwest's economic growth, all while prioritizing sustainable practices and transparent stakeholder collaboration.

BPA's GERP is an umbrella that pulls all BPA-led efforts together in a strategic view to optimize information sharing with stakeholders, customers and other parties. This includes pulling BPA 2026 Rate Case, Transmission Service Request, Generation Interconnection Requests and Line and Load processes under one umbrella.

## Grid Expansion and Reinforcement Portfolio (GERP) 1.0 Project Summaries

GERP 1.0 projects consist of 10 proposed projects at a preliminary projected cost of \$2 billion to support regional load growth, reliability needs and commercial transmission service requests.

*Note: These projects were previously referred to as Evolving Grid projects. They have been rebranded to reflect the expanded scope and purpose of the work.*

### **Big Eddy-Chemawa 230/500 kV Line Upgrade**

This project is a rebuild of portions of the existing Big Eddy-Chemawa #1 230 kV line to 500 kV. BPA proposes to rebuild and re-terminate 91 miles of line between BPA's Big Eddy Substation (The Dalles, OR), Ostrander Substation (Oregon City, OR) and Pearl Substation (Wilsonville, OR).

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$670 million.

Estimated completion: 2032

### **Bonanza 230/500 kV Substation**

This facility would be a new hub substation in Central Oregon near Prineville, OR. The new 115/230/500 kV Bonanza Substation would be built near BPA's existing Ponderosa Substation.

This project will create additional capacity to support new resource development and access to non-federal resources at a preliminary estimated direct cost of \$300 million.

Estimated completion: 2029 (updated)

### **Buckley 500 kV Substation Rebuild**

This project is a proposed rebuild of BPA's Buckley Substation in Sherman County, OR. It would be a new air-insulated 500-kV substation built near the existing gas-insulated substation, which will be retired.

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$150 million.

Estimated completion: 2028 (updated)

### **Chehalis-Covington 230 kV Line Upgrade**

This project is a proposed upgrade of a portion of the existing Chehalis-Covington #1 230-kV line. The work would consist of replacing conductor on 35 miles of line between BPA's Chehalis Substation (Chehalis, WA) and Cowlitz Tap (Frederickson, WA).

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$95 million.

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This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$670 million.

Estimated completion: 2032

### **Bonanza 230/500 kV Substation**

This facility would be a new hub substation in Central Oregon near Prineville, OR. The new 115/230/500 kV Bonanza Substation would be built near BPA's existing Ponderosa Substation.

This project will create additional capacity to support new resource development and access to non-federal resources at a preliminary estimated direct cost of \$300 million.

Estimated completion: 2029 (updated)

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This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$150 million.

Estimated completion: 2028 (updated)

### **Chehalis-Covington 230 kV Line Upgrade**

This project is a proposed upgrade of a portion of the existing Chehalis-Covington #1 230-kV line. The work would consist of replacing conductor on 35 miles of line between BPA's Chehalis Substation (Chehalis, WA) and Cowlitz Tap (Frederickson, WA).

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$95 million.

Estimated completion: 2028

## Cross Cascades North Upgrades

This series of upgrades consists of three projects designed to reinforce the Cross Cascades North path on the FCRTS.

- Schultz-Raver 500 kV Line Upgrade: BPA proposes upgrading the existing Schultz-Raver #3 and Schultz-Raver #4 500-kV lines to a higher rated capacity. BPA would reconductor the 77 miles of line between BPA's Schultz Substation (Ellensburg, WA) and Raver Substation (Ravensdale, WA).
- Paul 500 kV Substation Upgrade: BPA proposes adding a new capacitor at Paul Substation (Centralia, WA).
- Olympia 230 kV Substation Upgrade: BPA proposes adding a new Static VAR Compensator at Olympia Substation (Olympia, WA).

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$400 million.

Estimated completion: 2031 (updated)

## La Pine-Bonanza 230 kV Line

This project is a proposed new 53-mile 230-kV transmission line in Central Oregon between BPA's La Pine Substation (La Pine, OR) and proposed Bonanza Substation (Prineville, OR).

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$150 million.

Estimated completion: 2030



## Portland Area Upgrades

### Keeler-Horizon 230 kV Line #2 - **Completed (energized 2024)**

Terminating PGE's new Keeler-Horizon #2 line at BPA's Keeler Substation (Hillsboro, OR) and a new 500/230-kV transformer would also be added at Keeler Substation.

### Pearl-Sherwood-McLoughlin 230 kV Line Upgrade

Reconfiguring and re-terminating the Pearl-Sherwood-McLoughlin line at BPA's Pearl Substation (Wilsonville, OR).

Estimated completion: Summer 2026

### Keeler 230/500 kV Transformer Addition

A new 500/230-kV transformer would also be added at Keeler Substation (Hillsboro, OR).

Estimated completion: 2029

In total, these projects will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$150 million.

## **Rock Creek-John Day 500 kV Line Upgrade**

This project is an upgrade of the existing Rock Creek – John Day #1 500-kV line. BPA would rebuild 14 miles of line between the Rock Creek Substation (Goldendale, WA) and John Day Substation (Rufus, OR), including a Columbia River crossing.

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$37 million.

Estimated completion: Early 2030 (updated)

## **Ross-Rivergate 230 kV Line Upgrade**

This project is a proposed upgrade of the existing Ross-Rivergate #1 230 kV line. The work would consist of replacing conductor on 7.5 miles of line between BPA's Ross Substation (Vancouver, WA) and PGE's Rivergate Substation (Portland, OR), including a Columbia River crossing.

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$50 million.

Estimated completion: 2029 (updated)

## **Six Mile Canyon 230/500 kV Substation**

This is a proposed new 230/500-kV hub substation called Six Mile Canyon near Boardman, OR.

This project will create additional capacity to support regional load growth, reliability needs and commercial requests for long-term transmission at a preliminary estimated direct cost of \$250 million.

Estimated completion: Early 2028 (updated)

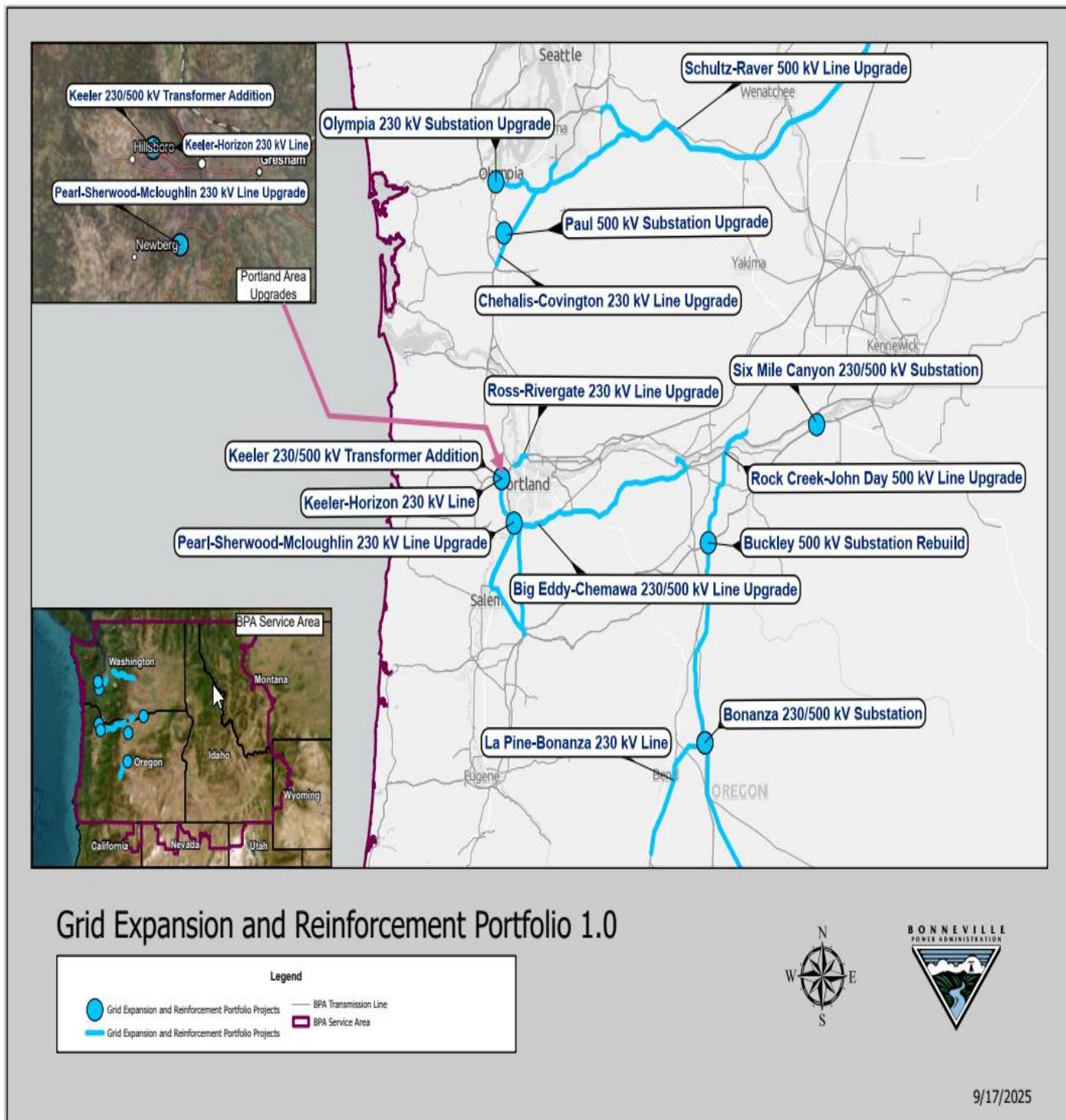


Figure 1 Grid Expansion and Reinforcement Portfolio 1.0

## Grid Expansion and Reinforcement Portfolio (GERP) 2.0 Project Summaries

GERP 2.0 projects consist of 13 proposed projects at a preliminary projected cost of \$3 billion to support regional load growth, reliability needs and commercial transmission service requests.

*Note: These projects were previously referred to as Evolving Grid projects. They have been rebranded to reflect the expanded scope and purpose of the work.*

### **Big Eddy-Quenett Creek Upgrade**

This proposed project would upgrade the Hood River sub-grid, rebuilding the Big Eddy-Quenett Creek 230kV to resolve the river crossing impairment.

### **Big Eddy-The Dalles Rebuild**

This proposed project is currently under study with Northern Wasco PUD to rebuild a 115 kV line BPA currently leases.

### **Central Oregon 500 kV Dynamic Reactive Upgrades**

This proposed project would install reactive support (STATCOM) for Central Oregon at Bonanza 500kV and a Captain Jack 500 kV.

### **Grand Coulee-Columbia-Schultz 500 kV Line Upgrade**

This proposed project would rebuild the existing Grand Coulee-Olympia 287 kV circuit to 500 kV. To loop into Columbia, the project would also build a new Columbia 500 kV substation yard, with a 500/230 kV transformer bank. This section of the line would terminate at Schultz Substation.

### **Lower Columbia to Nevada-Oregon Border**

#### **Lower Columbia to Bonanza**

This proposed project would build a new 500 kV transmission line between a substation in the Lower Columbia area and the planned Bonanza Substation in Central Oregon. It may include additional connections to 500 kV substations near the line route, as well as new 500 kV series capacitors.

#### **Bonanza to NOB**

This proposed project would build a new 500 kV transmission line from Bonanza Substation toward the Nevada-Oregon border (NOB). The project would also include new 500 kV series capacitors.

#### **Nevada-Oregon Border Substation**

This proposed project would build a new 500 kV substation at the Nevada-Oregon border.

## North of Pearl

This proposed project would upgrade transmission capacity in the Portland sub-grid North of Pearl area by reconductor the existing Pearl-Keeler #1 500 kV line and leveraging an existing corridor to add a second 500 kV line between Pearl and Keeler.

The existing Pearl-Sherwood #1 and #2 230 kV lines would be relocated/rebuilt to accommodate Pearl-Keeler #2 500 kV line.

The existing section of Keeler-Oregon City #2 115 kV between Sherwood and Oregon City would be repurposed as the new Keeler-Sherwood (PGE) 115 kV Line, terminating into Sherwood.

## Ostrander-Pearl #1 Upgrade

This proposed project would upgrade the Ostrander-Pearl #1 500 kV line and replace the existing 2.5" expanded conductor.

## RATS: Reno-Alturas Reactive Addition

This proposed project would install reactive support (STATCOM) at Warner 115 kV and Hilltop 230 kV.

## Salem Area Upgrades

These proposed upgrades would build on the Big Eddy-Chemawa project in GERP 1.0:

### North of Marion Upgrade #1

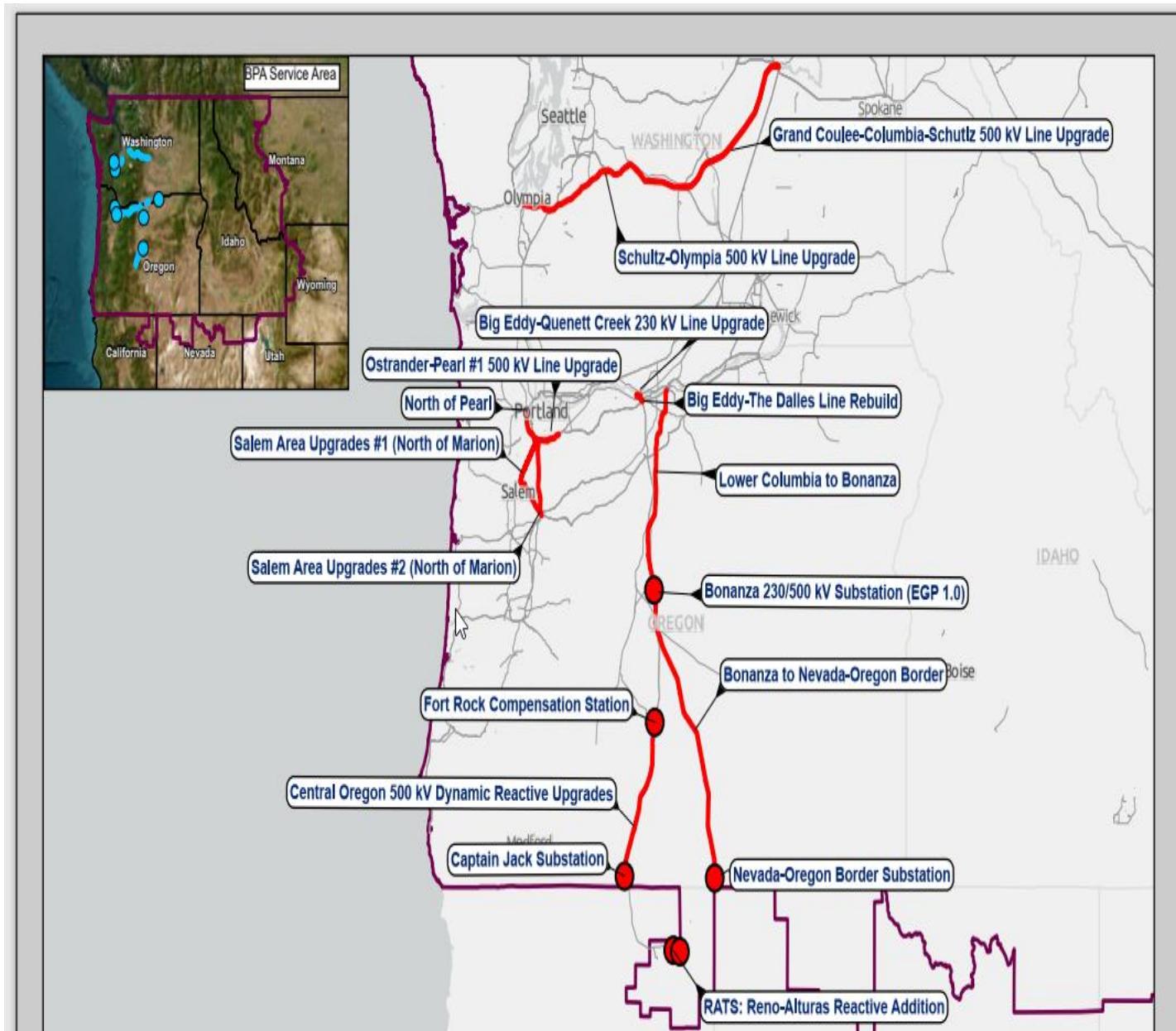
- Constructing a new 500 kV yard at Chemawa, including a new 500/230 kV transformer bank
- Rebuild the Pearl – Chemawa section of Big Eddy-Chemawa from 230 kV to 500 kV
- Rebuild the Chemawa – Santiam #1 from 230 kV to 500 kV

### North of Marion Upgrade #2

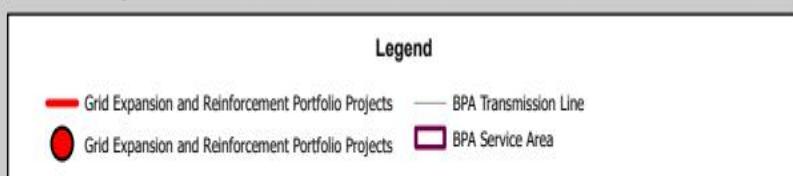
- Rebuild Pearl – Marion #1 500 kV transmission line and replace the 2.5" expanded conductor
- Rebuild the Oregon City – Chemawa 115 kV transmission line river crossing
- Add a second 230/115 kV transformer bank at Chemawa Substation

## Schultz-Olympia 500 kV Line Rebuild

This proposed project would rebuild the Schultz-Olympia portion of the Coulee-Olympia 287 kV to 500 kV. The project would also include an expansion of an Olympia 500 kV yard, a new 500/230 kV transformer bank, and three new 500 kV shunt capacitors.



## Grid Expansion and Reinforcement Portfolio 2.0



9/17/2025

Figure 2 Grid Expansion and Reinforcement Portfolio 2.0

### 3. Regional Needs

BPA is developing the Grid Access Transformation (GAT) process. The purpose of the GAT project is to develop changes to BPA processes for evaluation and expansion of the Federal Columbia River Transmission System. It has six main topics: 1) Network Integration Transmission Service Forecasts, 2) Evaluation Criteria, 3) Long-Term Firm Queue Management, 4) Interim Service, 5) Proactive Planning and, 6) Accelerate Expansion.

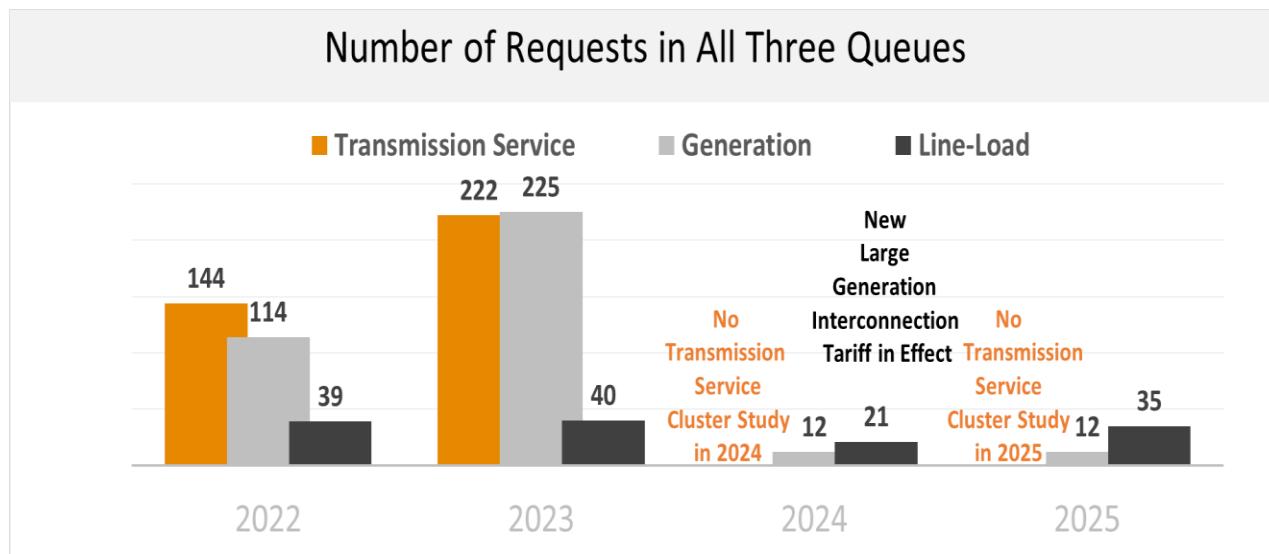
### 4. Customer Request Queues

Bonneville Power Administration Transmission Services is in an era of transformation driven by national and regional resource objectives, electrification of transportation and appliances, and other factors by enabling fundamental changes in power supply and demand. A substantial number of resources are being proposed on the east and west side of BPA's service territory to serve growing needs in load centers on the west-side, such as the Portland-metro area and the Puget Sound region.

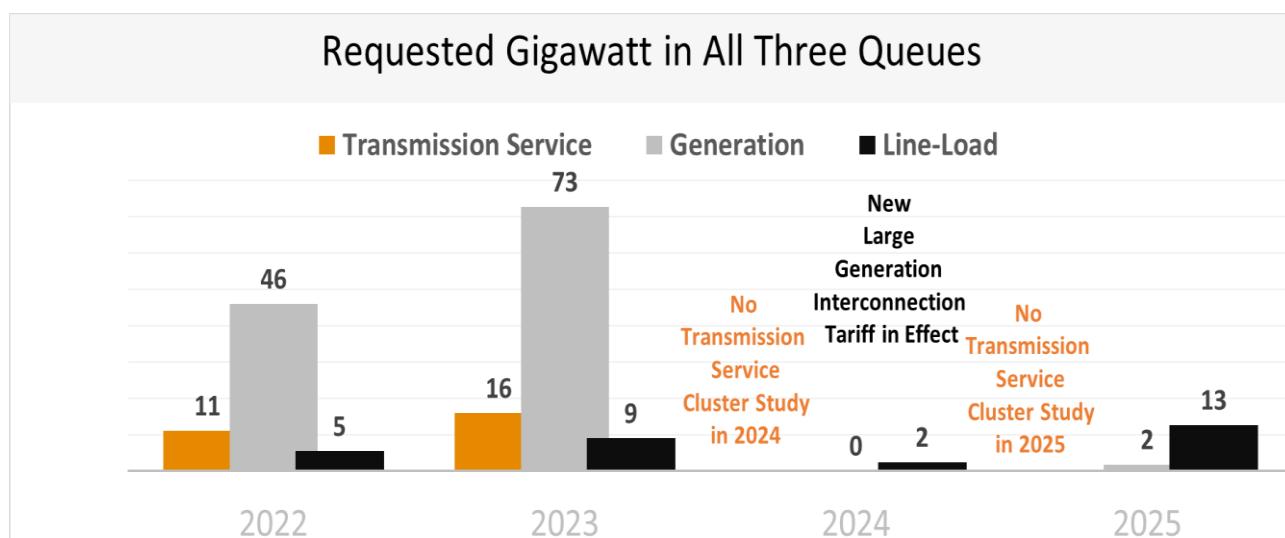
BPA operates three distinct queues as part of its planning processes. BPA's customers have submitted unprecedented requests seeking to meet growing energy demand and to deliver energy from the source to where it is needed. All three queues are experiencing significant growth and are showing no signs of slowing down. The following information in this section highlights the state of the queues, the new corrective action plans proposed this year and the top active transmission expansion projects.

1	Generation Interconnection Customer Requests Queue	2	Line & Load Interconnection Customer Requests Queue	3	Transmission Service Customer Requests Queue
---	--	---	---	---	--

The charts below show the number of customer requests and the associated gigawatts for transmission service, generation, and line-load interconnection requests. All three customer request queues have increased in the number of requests and the associated megawatts in recent years. Increases in generation interconnection requests led to reforms in BPA's Large Generator Interconnection Procedures (LGIP). BPA's new LGIP and Large Generator Interconnection Transition Process went into effect June 30, 2024. BPA is currently conducting the Large Generator Interconnection Transition Cluster Study. BPA has not conducted a transmission service request cluster study since 2023.



## Service



The interconnection data is as of November 10, 2025. The gigawatt value for the generation and line-load interconnection requests is the sum of the maximum summer megawatt values for each request divided by 1000.

## 4.1 Generation Interconnection Requests

The generation interconnection process is crucial for open access transmission, and is intended to ensure interconnection customers can interconnect to the transmission system in a reliable, efficient, transparent, and timely manner without undue discrimination. New resources submit interconnection requests and enter a queue. A significant increase in requests over recent years has led to a growing backlog. To address this, BPA reformed its Standard Large Generator Interconnection Procedures (LGIP), effective June 30, 2024, shifting from a first-come, first-served serial process to a first-ready, first-served cluster study process. This aims to more efficiently interconnect generators that are ready to proceed. BPA is currently conducting its Large Generator Interconnection Transition Cluster study for approximately 61 GW of requests.

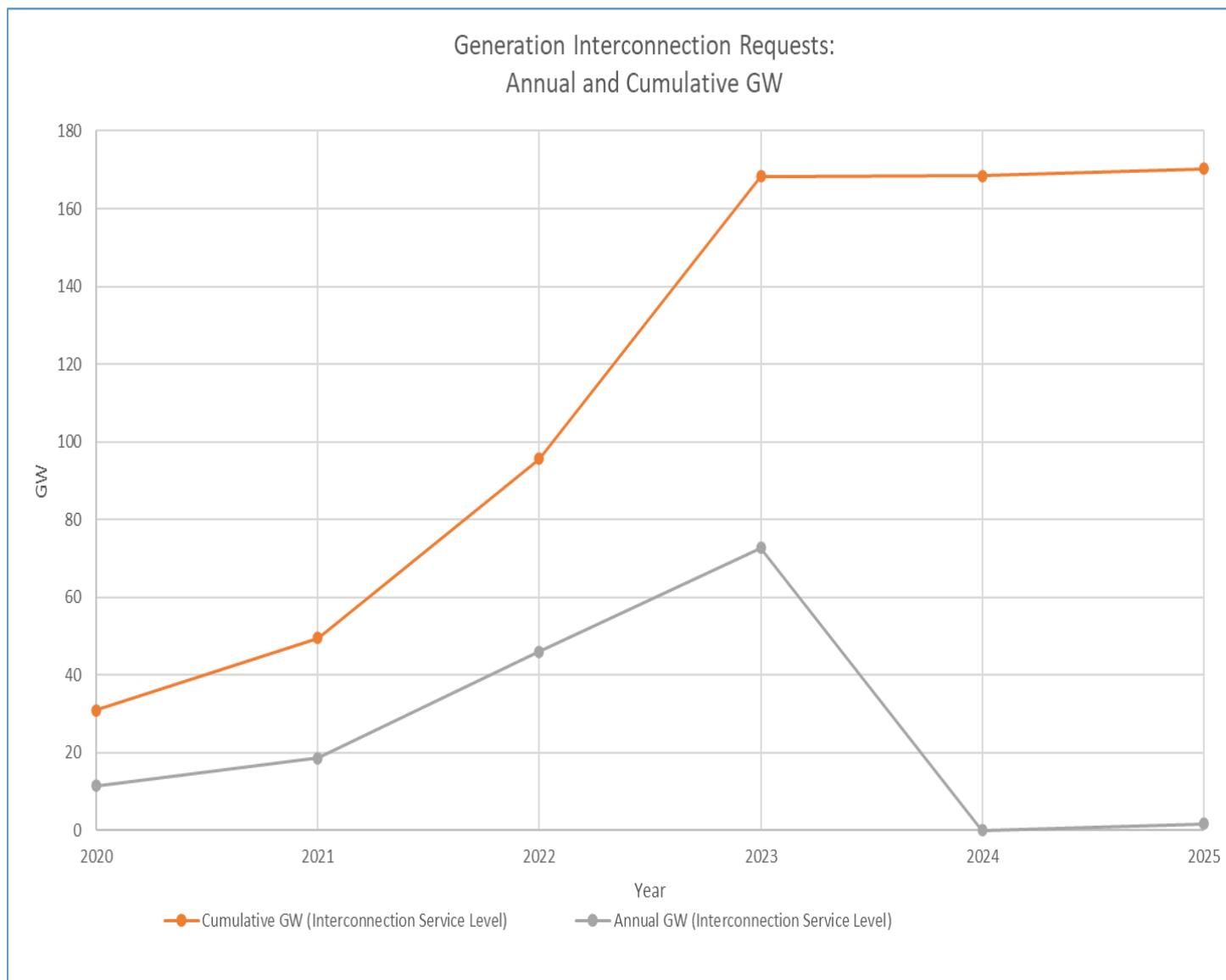


Figure 1 Generation Interconnection Requests in the Queue Chart

Attachment R (Large Generator Interconnection Transition Process) and updated Attachment L (LGIP) in BPA's OATT went into effect 6/30/2024. The Transition involved cutoff dates for eligibility, hence the appearance of a decline in requests. The Large Generator Interconnection Transition Phase One Cluster Study currently includes 167 requests for a total of approximately 61 GW of requested Interconnection Service Level.

## 4.2 Line and Load Interconnection Requests

Line and load interconnection requests are to serve ***new load growth***. In recent years BPA has experienced substantial growth in the line and load queue as customers submit requests.

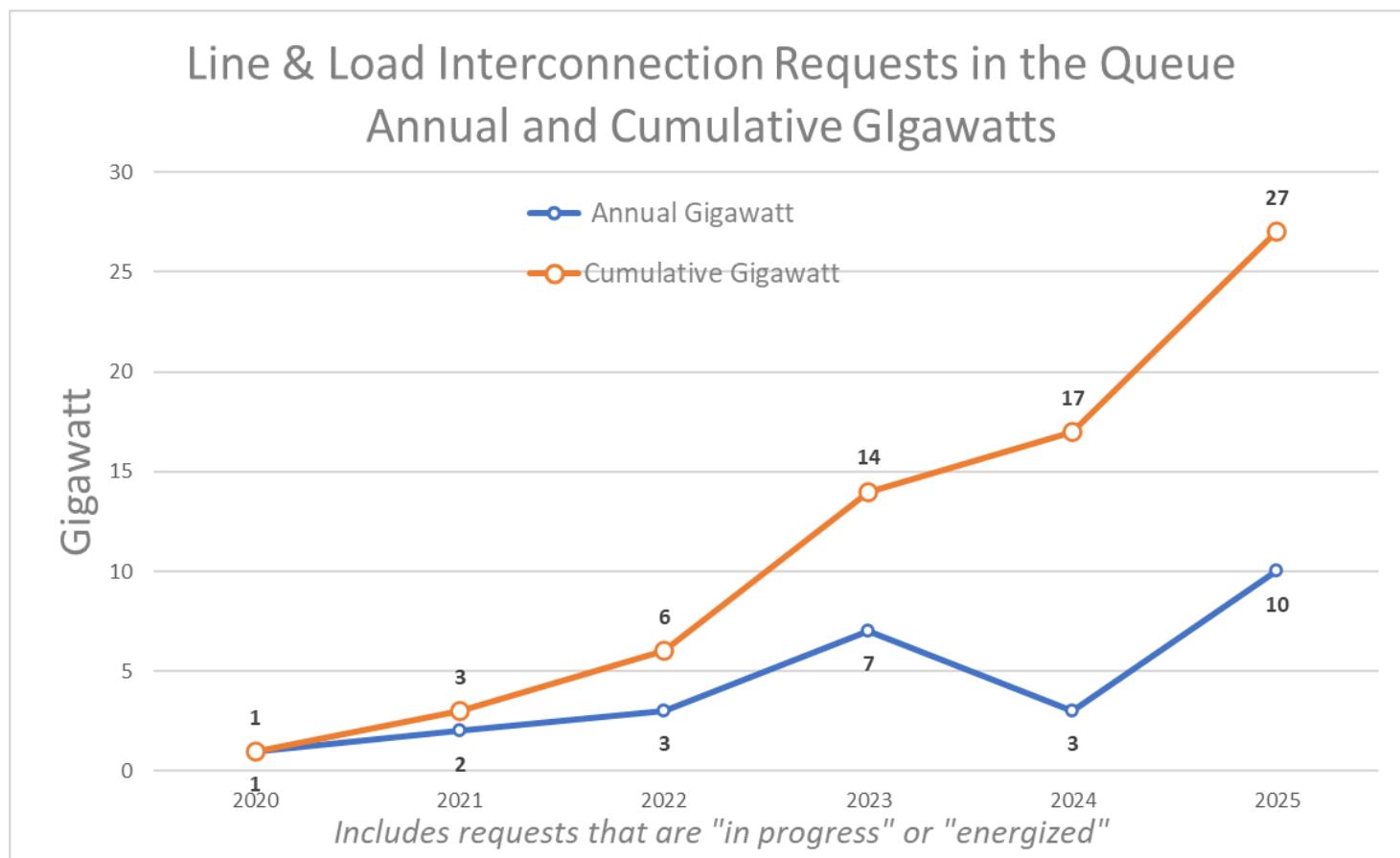


Figure 2 Line and Load Interconnection Requests in the Queue Chart

## 4.3 Transmission Service Requests

The Transmission Service Requests Study and Expansion Process (TSEP), which includes the Cluster Study, is the process where BPA responds to eligible requests for transmission service on the BPA network and determines where there is insufficient long-term firm (LTF) capacity. Where existing system capability is not adequate to accommodate the requested service, BPA identifies system reinforcements, or projects, that allow BPA to accommodate the incremental requests for service. BPA's 2023 TSEP Cluster Study was completed in February 2024. BPA received 222 transmission service requests that met the eligibility requirements with an associated demand of 16 gigawatts.

## 5. BPA Planning Process Overview (OATT Attachment K)

### 5.1 Transmission Planning Responsibilities

The BPA Open Access Transmission Tariff (OATT) Attachment K outlines an annual planning process for the Transmission Provider's Transmission System, ensuring BPA meets its OATT obligations for providing transmission and interconnection services. It details BPA's coordination with various stakeholders, including transmission customers, neighboring providers, and state authorities. Neither Attachment K nor the BPA Transmission Plan mandates specific investments or cost recovery; BPA retains discretion in investment decisions, informed by planning data and NEPA requirements.

The planning process involves the Transmission Provider, its OATT customers, and other entities like transmission providers, states, tribes, WECC, and sub-regional planning groups, even if not contractually bound. While BPA is obligated to participate in planning, provide data, and consider stakeholder input, the cooperation of these external entities is crucial. A lack of cooperation can impede BPA's activities.

BPA diligently seeks cooperation from other entities on Attachment K planning but is not responsible for their performance. For example, if a Transmission Customer or other entity fails to provide necessary data, the Transmission Provider may be unable to adequately incorporate their needs into its planning.

### 5.2 Public Meetings and Postings Timeline

BPA's Attachment K Planning Process is an annual cycle (January-December) for Transmission Services to conduct system planning meetings, as mandated by its Open Access Transmission Tariff Attachment K and FERC Order 890. A core objective is to develop a ten-year transmission expansion plan, identifying reinforcements based on forecasted load growth, firm transmission service commitments, interconnection requests, and reliability assessments. These meetings offer customers and interested parties a chance to discuss and inform planning studies and service plans. BPA provides Attachment K process information, including meeting notifications, study results, and service plans, on its website. To participate, complete and email the Participation Request Form.

## Open Access Transmission Tariff: Attachment K Planning Cycle

# Customer Meetings and Postings Timeline

Visit BPA's Attachment K Planning Process web page for more information



Figure 3 Attachment K Customer Meetings and Postings Timeline

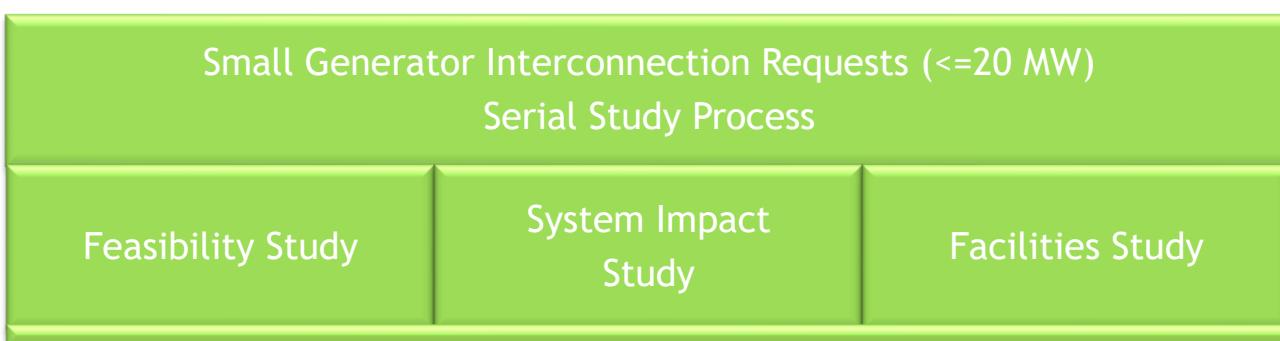
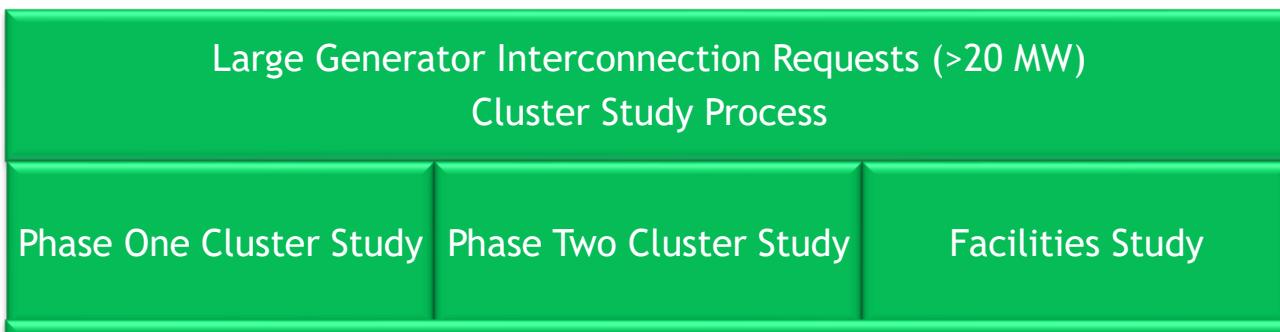
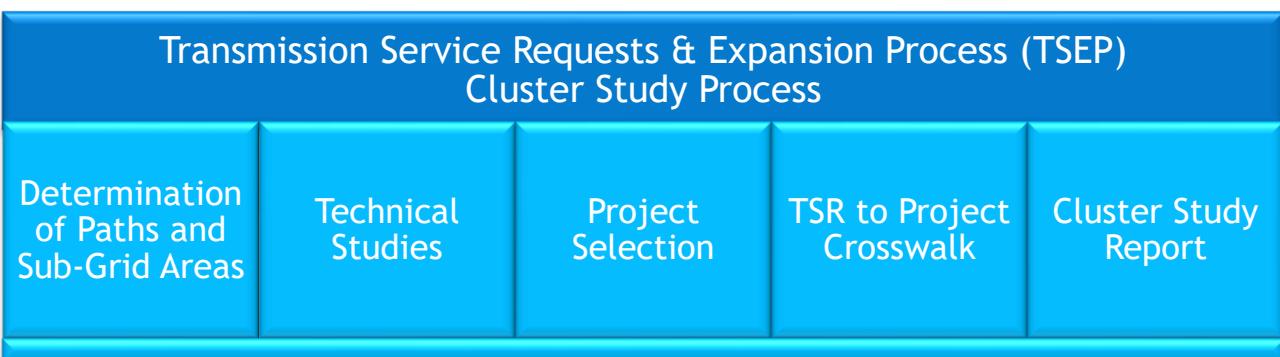
## 5.3 Economic Study Requests

As part of BPA's Attachment K Planning process economic studies may be requested by customers to address congestion issues or the integration of new resources and loads. BPA will complete up to two economic studies per year at its expense. A customer may make a request for an economic study by submitting a request to [PlanningEconomicStudyRequest@bpa.gov](mailto:PlanningEconomicStudyRequest@bpa.gov). A request may be submitted at any time. A request submitted after October 31 will be considered in the next annual prioritization process.

The Transmission Provider will hold a public meeting to review each request that has been received for an Economic Study and to receive input on such requests from interested persons. The Transmission Provider may review Economic Study Requests as part of its regularly scheduled Planning Meetings as outlined in Attachment K.

After consideration of such review and input, a determination will be made as to whether, and to what extent, a requested Economic Study should be clustered with other Economic Study requests and whether a study is considered a high priority. BPA funds high-priority economic studies. Any studies determined not to be high priority will not be performed by BPA, but BPA may assist in finding an alternate source for performing the studies.

## 6. Transmission Planning Study Processes



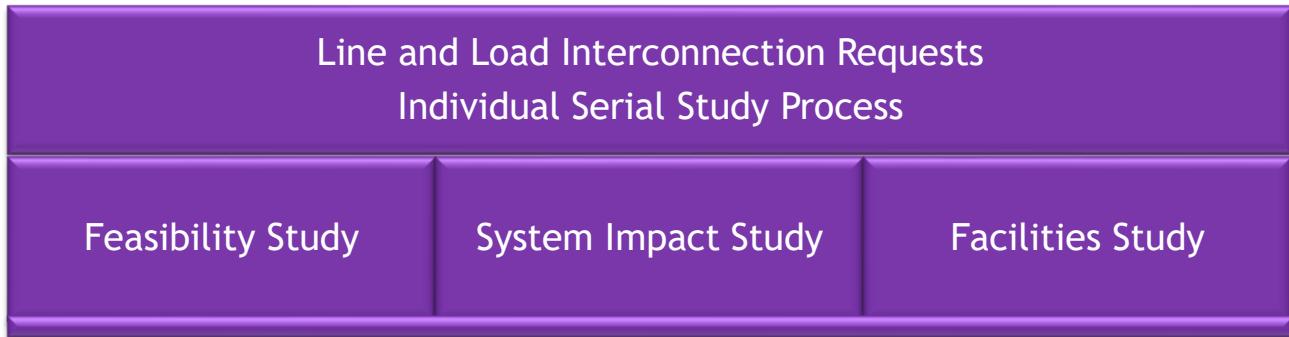


Figure 4 Transmission Planning Study Processes Diagram

## 6.1 System Assessment Study Process

Each year, Transmission Planning conducts a comprehensive assessment of BPA's transmission system to ensure compliance with applicable North American Electric Reliability Coordination (NERC) Planning Standards and Western Electricity Coordinating Council (WECC) Regional Criteria. (WECC is the Regional Reliability Organization for NERC.)

The NERC Standard TPL-001-5.1 requires that BPA conduct an annual planning assessment to ensure that the BPA network is planned such that it can operate reliably over a broad spectrum of system conditions following a wide range of probable contingencies over the near-term (one to five years) and long-term (six to ten years) planning horizon while meeting the established reliability standards and criteria. The assessment covers a 10-year planning horizon.

The major load centers in the Pacific Northwest are located west of the Cascade Mountains including Seattle and Portland. For the 2025 system assessment, the load service areas were grouped into 9 "Planning Areas" and 27 load areas based on geographic and electrical proximity.

Each of the load areas are assessed under peak loading conditions for that area. Each area is then evaluated to identify any potential performance deficiencies and determine possible corrective action plans or confirm existing corrective action plans to meet applicable standards and criteria and ensure system reliability and cost-effectiveness.

To effectively study the transmission system, BPA's main grid is also divided into 14 internal paths and 4 interties for the system assessment. The function of these paths and interties is to

transmit bulk power across the system. The distinction between them is that paths are internal to BPA's network and the interties connect BPA's network with other sub-regional systems in the Western Electricity Coordinating Council (WECC) region including British Columbia, Montana, and both northern and southern California.

BPA also assesses the performance of the paths and interties over the Planning Horizon. The studies conducted for each load area and path include steady state, voltage stability, and transient stability studies. Short circuit analysis is also conducted annually as part of BPA's Switchgear Replacement Program.

### **6.1.1 Verification of Study Need**

For each load area and path, a new study or qualified past study was used to ensure that existing and forecast load is served, and transmission system reliability is maintained over a broad spectrum of system conditions throughout the planning horizon and that existing or newly identified corrective action plans, such as system reinforcements, are adequate. The NERC TPL-001-5.1 Requirement 2.6 states that qualified past studies may be used to support the Planning Assessment if the study is five years old or less and no material modifications have occurred to the System represented in the study.

For each load area and path, the following are reviewed to determine if the previous studies are still valid:

1. Topology
2. Historic load peaks
3. Path firm transmission service obligations below TTC in the Planning Horizon
4. Load forecast and generation patterns
5. New or retired generation or loads interconnected to the transmission system.
6. Known transmission or generator outages.

### **6.1.2 Criteria**

The BPA transmission system is planned to meet applicable NERC Transmission Planning System Performance Standard TPL-001-5.1. Contingency events and the required performance for those events are established in Table 1 of the NERC TPL-001-5.1 Standard. The following table includes the Categories of Contingency Events from the NERC Standard.

TPL-001-5.1 Category Events		
Normal System	P0	No Contingency
Single Contingency	P1	Single contingency of an element* or DC mono-pole
Single Contingency	P2	Bus section or internal breaker fault, or line section with no fault
Multiple Contingency	P3	Loss of generator plus an element* with system adjustment in between
Multiple Contingency	P4	Multiple elements* caused by stuck breaker
Multiple Contingency	P5	Multiple elements due to non-redundant relay failure
Multiple Contingency	P6	Loss of two single elements* with system adjustment in between
Multiple Contingency	P7	Loss of two circuits on common structure, or DC bi-pole

Note: Element refers to: a generator, transformer, transmission circuit, or shunt device.

Figure 5 System Assessment NERC TPL-001-5.1 Category Events List

In addition to the NERC Planning Standards, BPA also applies the WECC System Performance Regional Criterion, TPL-001-WECC-CRT-4, where applicable.

Category P3 and P6 multiple contingencies both involve loss of an element, followed by system adjustment, followed by loss of a second element. Category P3 is specifically for loss of a generator followed by a second contingency of a transmission element, whereas Category P6 is loss of a transmission element followed by a second contingency of another transmission element. For most load areas, federal generation is located remotely from the load area and is delivered across transmission facilities into the areas. For those load areas that do have generation sources internal to the area, the external transmission facilities that also feed those areas are larger than the local generation. Therefore, the transmission outages under P6 are normally more severe than generation outages under P3. For load areas that do have a large single generator unit internal to the area, base case sensitivities with that generator offline were evaluated. For paths, major generation tends to be on the sending end of the major transmission paths where loss of a generator reduces power flow across the paths and therefore P3 contingencies produce less severe impacts than P6. Category P6 contingencies produce more stressed conditions for paths, which produce more severe results for the BPA transmission system. Therefore, the path studies focused on Category P6 contingencies.

### 6.1.3 Base Cases

The purpose of base case development is to provide sufficient base cases that can be used as the starting point for the technical studies that are required by applicable reliability standards such as Transmission Planning Standard TPL-001-5.1 and others. The NERC TPL-001-5.1 Standard outlines a minimum of seven cases.

Transmission Planning's assessment includes the creation of study base cases starting with WECC approved base cases from the latest WECC Study Program. Additional base cases are created as necessary to cover other conditions that may need to be studied. If there is not an appropriate WECC approved base case in the latest WECC Study Program, the latest WECC approved base case from the previous WECC Study Program or from the previous year's assessment, whichever is later, are modified to reflect the corresponding year and season. For the years when new cases are not developed, the previous year's cases are updated for any study needs identified.

The NERC Planning Standard TPL-001-5.1 requires that the steady-state portion of the assessment be conducted for the following base cases (R2):

- System peak Load for year one or year two (R2.1.1)
- System peak Load for year five (R2.1.1)
- System Off-Peak Load for one of the five years in the Near-Term Planning Horizon (R2.1.2)
- System peak Load for one of the years in the Long-Term Planning Horizon (R2.2.1)

The base cases used for the previous System Assessment adequately covered these scenarios and required sensitivities. The base cases used for the steady state portion of the 2025 System Assessment originated from the latest available WECC approved base cases for the Near Term and Long-Term Planning horizons, covering both peak and off-peak loads. Load forecasts and topology for those WECC cases were then modified to create the 2025 system assessment study cases:

#### **6.1.4 Corrective Action Plans**

If transmission system performance is not adequate to meet NERC and WECC performance requirements, the study process includes the development of corrective action plans as required. These include system additions and upgrades or remedial action schemes. These plans take into consideration non-wire solutions, existing remedial action schemes, and operating procedures. The corrective action plans are studied to ensure they provide adequate system performance. If there are multiple alternatives, the best overall plan is recommended. If

a non-wires solution is identified it is coordinated with the non-wires team to determine feasibility of the solutions.

### **6.1.5 Technical Study Findings**

After the study process is complete the findings are documented in detailed area and path study reports. If a previous year's detailed report is still valid, a validation report is completed. This type of report includes the verification checks that support the conclusion that a new study is not required, and reference to the previous study report.

### **6.1.6 BPA Communicates System Assessment Results**

The System Assessment Summary Report is shared with adjacent Transmission Planners (TPs) and Planning Coordinators (PCs) after the technical studies are completed, detailed reports are finalized, and the System Assessment Summary report is completed. If individual areas or paths are adjacent to TPs and PCs and problems are identified, the respective planners for those areas and paths coordinate with those TPs and PCs to resolve common issues.

### **6.1.7 System Planning Cycle**

System Planning is performed annually. Data collection and modeling occurs at the forefront of the system planning process. Detailed technical studies are performed to gauge the performance of the transmission system with respect to NERC standards and WECC criteria. These studies eventually result in identifying and testing new transmission reinforcements (corrective action plans), where required. When the detailed technical studies are completed, the results are used to develop the System Assessment Summary Report, and the Summary Report is used to document compliance.

## **6.2 Transmission Service Requests**

BPA customers may submit long-term transmission service (TSR) requests. Transmission Planning's tariff obligations for TSRs include Sections 19 and 32 of the BPA Open Access Transmission Tariff (OATT). Section 19 pertains to additional study procedures for firm point-to-point (PTP) service and Section 32 pertains to network integration (NT) transmission service requests. Specifically, Sections 19.1 through 19.6 of the OATT address the System Impact Study

(SIS) and Facilities Study (FAS) procedures for firm point-to-point customers. Sections 19.10 and 32.6 address the Cluster Study (CS) procedures. Transmission Planning conducts the additional studies as prescribed in the OATT.

### **6.2.1 The Transmission Service Requests Study and Expansion Process (TSEP)**

The Transmission Service Requests Study and Expansion Process (TSEP) is BPA's process to manage and respond to Long-Term TSRs on the BPA network. The TSEP is to plan for and grant transmission service to Network (NT) customers consistent with BPA's statutory authorities and BPA's tariff obligations while granting timely service to those customers seeking point-to-point (PTP) service. It is intended to be a repetitive and effective process that provides a balance in serving different customer classes (PTP and NT) on a non-discriminatory basis.

### **6.2.3 TSEP Cluster Study**

Transmission Planning conducts the Cluster Study analysis of TSRs and determines the transmission reinforcement requirements to accommodate the TSRs. The purpose of the Cluster Study is to determine how much available transfer capability can be offered and which new facilities, if any, will be required to accommodate customer requests for transmission service. A Cluster Study simultaneously evaluates, by aggregating multiple TSRs into a cluster, all customer requests for long-term firm transmission service and evaluates total demand across its network paths.

### **6.2.4 Cluster Study Process**

BPA customers who request transmission service may do so during a limited-time submission window. After the request for transmission service window closes, agreements are offered to all eligible customers who made a TSR. This agreement obligates the customer to pay for its pro-rata share of the Cluster Study costs.

The transmission queue is first restacked by removing TSRs for which customers failed to return an executed agreement including sufficient data exhibits. The remaining TSRs are evaluated to see if existing long-term available transfer capability (LT ACT) can accommodate any potential offers of service. TSRs with cumulative material impacts that exceed the LT ATC for any impacted flow gate are included in the Cluster Study. BPA then determines if it can make offers of service based on existing LT ATC to any of the TSRs that remain in the queue.

Transmission Planning performs a Cluster Study to determine additional facilities, if any, required to accommodate service to TSRs for which there is insufficient LT ATC. Transmission Planning proceeds with detailed technical studies and flow-based studies. Based on the study's results, potential projects are identified.

The Cluster Study includes the following fundamental elements:

- Determine which requests could be accommodated by the existing system.
- Determine which requests require system reinforcement.
- Develop plans of service for requests that require system reinforcement.
- Demonstrate that the interconnected transmission system, together with the identified reinforcements, can accommodate the requested service.

### **6.2.5 Determination of Cluster Study Areas**

For all TSRs that require further evaluation TPP determines transmission reinforcements to accommodate the requested service, BPA-TS combines TSRs with similar PORs (i.e., those PORs that are close enough to cause similar impacts on the transmission system); similarly, BPA-TS combines TSRs with similar PODs (i.e. those PODs that are close enough to cause similar impacts on the transmission system). These combinations result in forming Cluster Study areas that are studied together in more detail to identify plans of service that can accommodate the requested service.

Detailed technical studies are performed on each of the study areas to define the actual reinforcements needed. These studies consider a combination of firm and non-firm uses of the system including load growth, interconnection projects, and projects on adjacent systems that are included in traditional planning methods. The result is a more robust transmission expansion plan to meet the expected, as well as requested, obligations of the system.

If a TSR has non-*de minimis* impacts that exceed the ATC for any flowgate or has an adverse sub-grid impact, the Cluster Study further evaluates the TSR to identify the transmission expansion necessary to provide the requested service.

## 6.2.6 TSEP Cluster Study Report

The Cluster Study report summarizes the findings of the analysis and power flow modeling that is conducted and includes a list of projects. It also provides information about the methodology employed for the current Cluster Study, including study areas, generation scenarios, and generation sensitivities. It may also provide background on projects completed outside TSEP and projects from the previous TSEP, and other reliability or load service projects.

## 6.2.7 TSEP Cluster Study Cycle

### 2023 TSEP Cluster Study Cycle

The 2023 Cluster Study was delayed due to the high volume and complexity of requests for service and BPA's customer collaborative approach to address 2023 Cluster Study Data Exhibit deficiencies. While the original plan was to complete the 2023 Cluster Study in early May, BPA Transmission provided study results to the 2023 Cluster Study participants in February of 2024.

### Future TSEP Cluster Study

Each of the past three years, cluster studies have grown in volume and complexity due to the impact of clean energy requirements in Northwest states, incentives to produce renewable resources, electrification, and other factors. In addition to the increased study participation, the impacts on neighboring Balancing Authorities and customer systems are an additional factor that adds complexity and time. This growth in transmission cluster study participation mirrors the exponential growth of our interconnection queues.

Please follow the BPA Transmission Service Requests and Expansion Process page for current information on the study cycle updates, [TSR Study & Expansion Process - Bonneville Power Administration](#). The TSEP process could be modified as part of BPA's Grid Access Transformation (GAT) effort. More information about GAT is available at [Bonneville Power Administration Grid Access Transformation Project](#)

### TSEP Phases Diagram

More information about the Transmission Service Requests Study and Expansion Process (TSEP) Business Practice is available on the BPA website at [TSR Study and Expansion Process \(TSEP\) \(bpa.gov\)](https://www.bpa.gov/TSRStudyandExpansionProcess). The Business Practice document describes the BPA TSEP and provides information regarding requirements for customer requests for individual study of services requests.

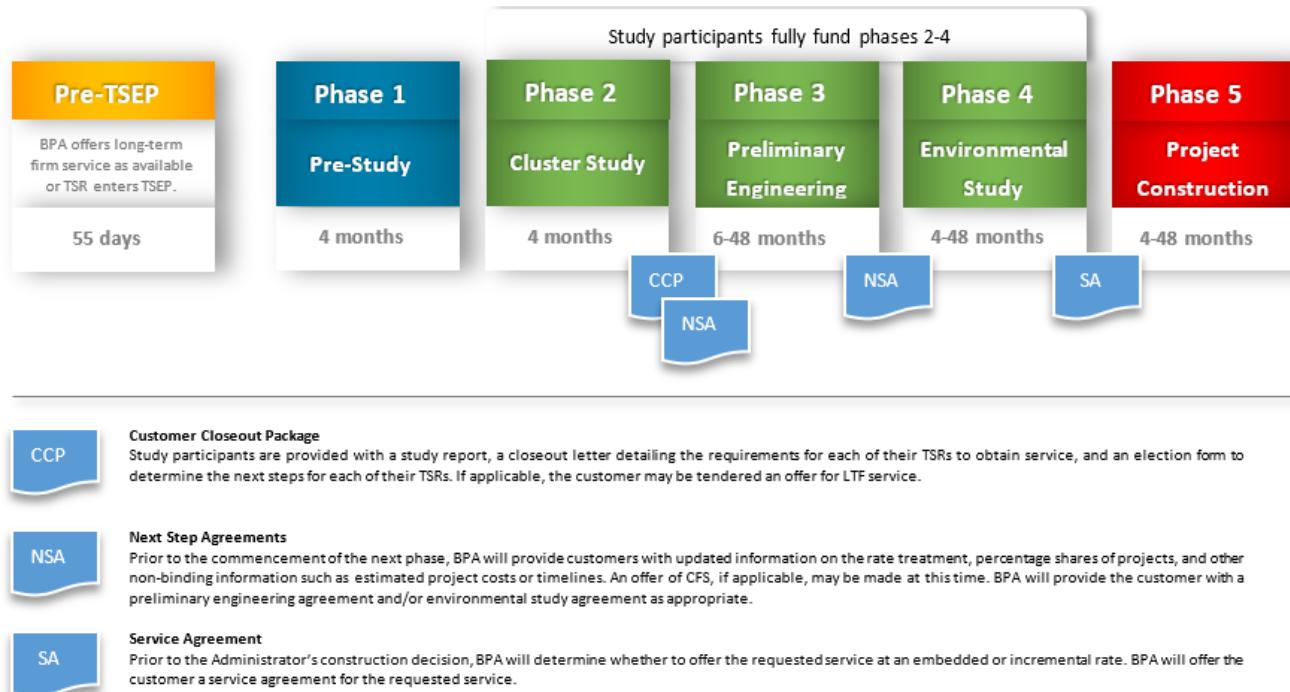


Figure 6 TSEP Phases Diagram

## 6.3 Interconnection Requests

Customers may request new points of interconnection on BPA's transmission system governed by BPA's Open Access Transmission Tariff and BPA's Business Practices. Customers can also interconnect to existing points of interconnection such as an existing substation. Line or load interconnections (LLI) are typically for new load additions or to allow the customer to shift existing load to different points on BPA's system.

BPA customers may also request interconnection service to connect new generation to BPA's transmission system. BPA receives Generator Interconnection (GI) requests according to Attachment L Large Standard Generator Interconnection Procedures (LGIP), Attachment R Large Generator Interconnection Transition Process, and Attachment N Standard Small Generator Interconnection Procedures (SGIP) of the BPA Open Access Transmission Tariff.

### 6.3.1 Interconnection Requests Studies

When a customer makes a request for a generator or line and load interconnection, Transmission Planning conducts and supports a series of up to three studies which are performed after a customer has signed an agreement for each study:

#### Large Generator Interconnection (LGI)

- LGI Phase One Cluster Study
- LGI Phase Two Cluster Study
- Interconnection Facilities Study (FAS)

#### Line/Load Interconnection and Small Generator Interconnection (SGI)

- Interconnection Feasibility Study (FES)
- Interconnection System Impact Study (SIS)
- Interconnection Facilities Study (FAS)

### 6.3.2 LGI Phase One Cluster Study

The scope of the LGI Phase One Cluster Study is to provide a preliminary analysis of the necessary Interconnection Facilities and Network Upgrades required to reliabilty interconnect the Generating Facilities in the applicable Cluster Area at the requested Interconnection Service Level. The Phase One Cluster Study consists of powerflow analysis and short circuit analysis. The Phase One Cluster Study Report includes the Point of Interconnection, assumptions upon which the Phase One Cluster Study Report is based, results of the analysis, and requirements or potential impediments to providing the Interconnection Service requested by any Interconnection Customer in the Cluster, including a non-binding good faith estimate of cost and non-binding good faith estimated time to construct.

### 6.3.3 LGI Phase Two Cluster Study

The LGI Phase Two Cluster Study incorporates the information and assumptions contained in the Phase One Cluster Study Report and provides additional analysis of the necessary Interconnection Facilities and Network Upgrades required to reliabilty interconnect the Generating Facilities in the applicable Cluster Area at the requested Interconnection Service Level. In addition to steady state thermal and voltage analysis, voltage stability and transient

stability analysis is performed, as well as analysis of short circuit capability limits. The Phase Two Cluster Study Report includes assumptions upon which the Phase Two Cluster Study Report is based, results of the analysis, and requirements or potential impediments to providing the Interconnection Service requested by any Interconnection Customer in the Cluster, including a non-binding good faith estimate of each Interconnection Customer's share of the cost and a non-binding good faith estimated time to construct.

#### **6.3.4 Line/Load Interconnection and SGI Feasibility Study**

The scope of the FES is to provide a high-level preliminary evaluation of the feasibility of the proposed interconnection to the transmission system. Execution of the FES Agreement is optional if BPA and the customer agree. If a FES is needed, Transmission Planning performs power flow steady state analysis, produces a sketch or draft project requirement diagram of the project, and determines typical costs and a schedule.

#### **6.3.5 Line/Load Interconnection and SGI System Impact Study**

Transmission Planning performs the SIS to evaluate the impacts of the proposed interconnection to the reliability of the transmission system. In addition to steady state thermal and voltage analysis, voltage stability and transient stability analysis is performed, as well as analysis of short circuit capability limits. A draft project requirements diagram is developed and a non-binding good faith cost and schedule are determined.

#### **6.3.6 Facilities Study**

Interconnection Facilities Studies specify and provide a non-binding estimate of the cost of equipment, engineering, procurement, and construction work needed to implement the conclusions of the Phase Two Cluster Study Report (and any associated Cluster Re-Studies) for LGI and the System Impact Study for Line/Load Interconnection and SGI. The Facilities study also identifies the electrical switching configuration of the connection equipment, including transformers, switchgear, meters and other station equipment. This information is relayed in the form of a Project Requirements Diagram. The Facilities Study Report provides a description, estimated cost, and estimated schedule for time required to complete the construction and installation of required facilities to interconnect the project to the transmission system. Specific to generation interconnection, the Facilities Study also identifies any potential control

equipment for requests for Interconnection Service that are lower than the Generating Facility Capacity.

## 7. Study Planning Areas, Paths, & Intertie Maps

For study purposes, the transmission system is divided into planning areas and load service areas. The planning and load service areas are based on geographic and electrical proximity. To effectively study the transmission system BPA's main grid is also divided into internal paths and interties for the system assessment. The function of these paths and interties is to transmit bulk power across the system. The distinction between them is that paths are internal to BPA's network and the interties connect BPA's network with other sub-regional systems in the Western Electricity Coordinating Council (WECC) region including British Columbia, Montana, and both northern and southern California.

## 7.1 Planning and Load Service Areas Map

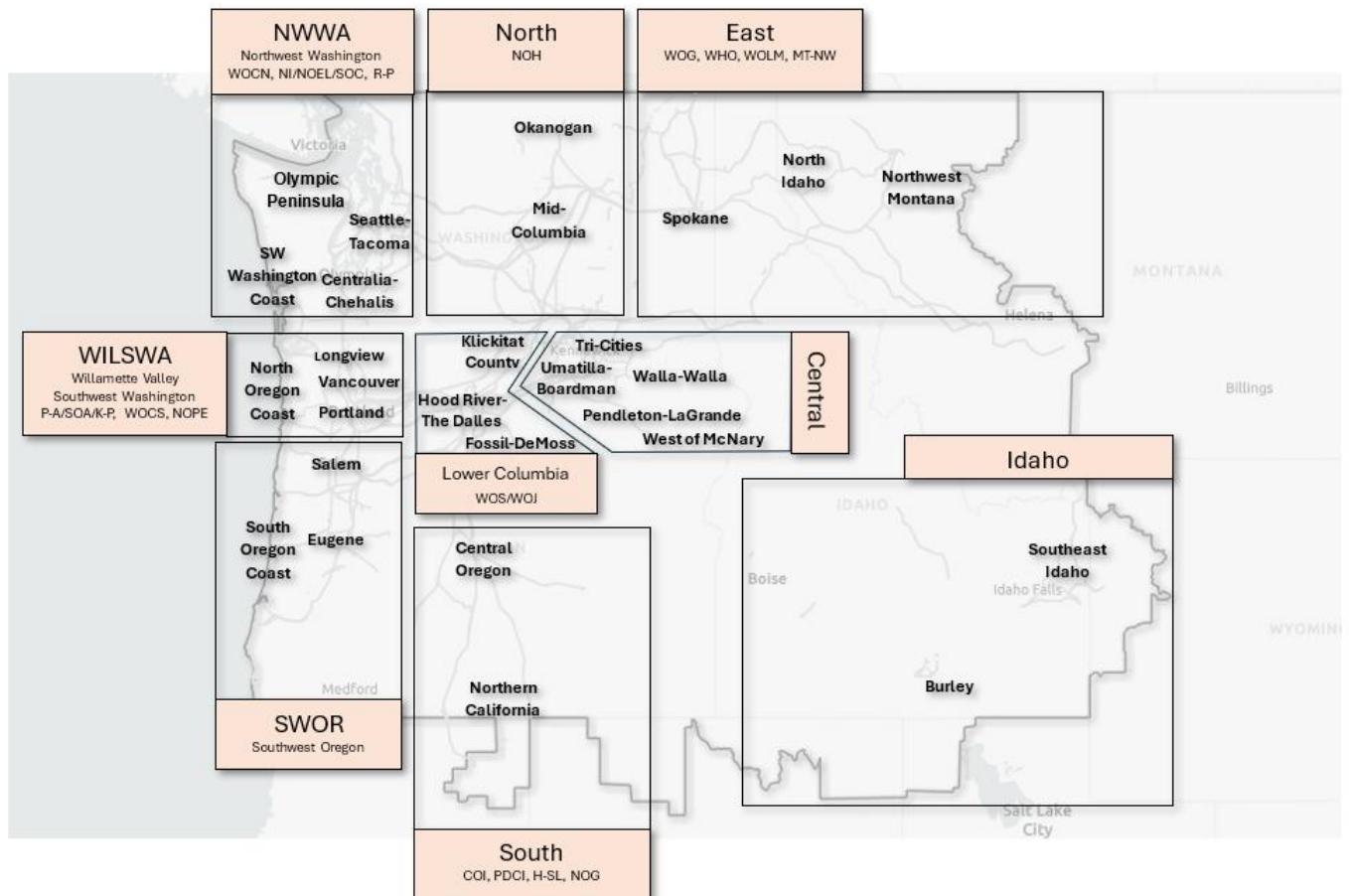


Figure 7 Planning and Load Service Area Map

## 7.2 Paths and Interties Map

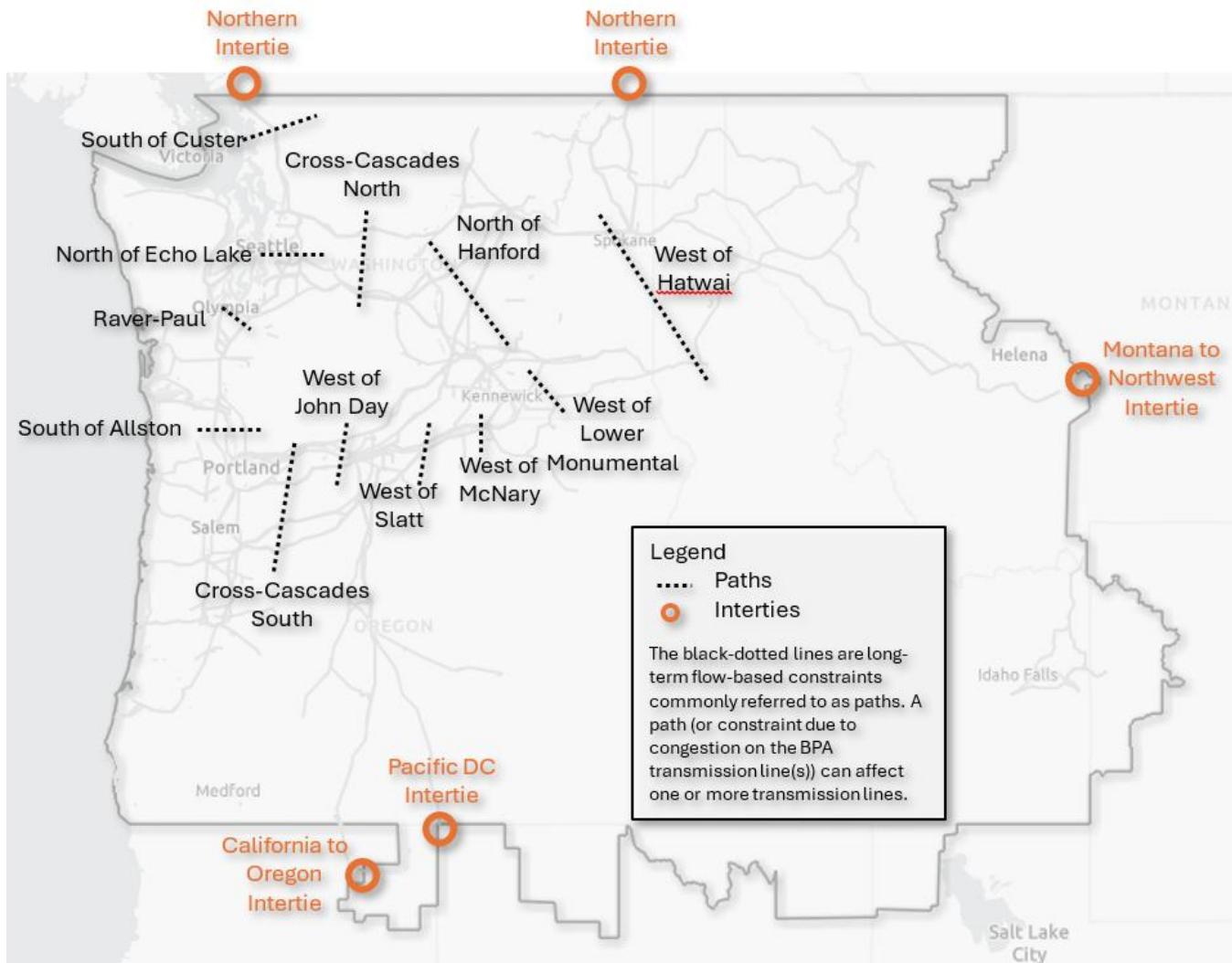


Figure 8 Path and Intertie Map

## 7.3 Planning and Load Area, Paths and Interties List

Planning and Load Service Areas		Paths
<b>1. NWWA</b>	<b>Northwest Washington</b>	
	Chehalis - Centralia	1. South of Custer
	Olympic Peninsula	2. South of Allston
	Seattle – Tacoma	3. North of Echo Lake
	Southwest Washington Coast	4. North of Hanford
<b>2. WILSWA</b>	<b>Willamette Valley Southwest Washington</b>	5. Raver Paul
	North Oregon Coast	6. Cross Cascades North
	Longview	7. Cross Cascades South
	Portland	8. West of John Day
	Vancouver	9. West of Slatt
<b>3. SWOR</b>	<b>Southwest Oregon</b>	10. West of McNary
	South Oregon Coast	11. West of Lower Monumental
	Salem – Albany	12. West of Hatwai
	Eugene	13. North of Pearl
<b>4. L-Columbia</b>	<b>Lower Columbia</b>	14. North of Grizzly
	Hood River – The Dalles	
	Klickitat	
	De Moss – Fossil	
<b>5. North</b>	<b>North</b>	
	Mid-Columbia	1. Montana to Northwest
	Okanogan	2. Pacific DC
<b>6. Central</b>	<b>Central</b>	3. California Oregon
	Pendleton – La Grande	4. Northern
	Tri-Cities	
	Walla Walla	
	Umatilla – Boardman	
<b>7. South</b>	<b>South</b>	
	Central Oregon	
	Northern California	
<b>8. East</b>	<b>East</b>	
	Spokane – Colville – Boundary	
	North Idaho	
	Northwest Montana	
<b>9. Idaho</b>	<b>Idaho</b>	
	Burley	
	SE Idaho – NW Wyoming	

Figure 9 Planning and Load Service Areas, Paths and Interties List

## 8. Transmission Needs by Planning Areas

On an annual basis, Transmission Planning provides a ten-year plan for reinforcements to BPA's transmission system, and this is provided in accordance with Attachment K of the BPA Open Access Transmission Tariff. This section provides a narrative description of the transmission needs identified through the transmission planning process, the preferred alternative, an estimated cost, and estimated schedule for completion of the preferred alternative. It also reflects plans for facilities needed to provide requested interconnection or long-term firm transmission service on BPA's system. The objective of this section is to identify and describe reinforcement projects for the transmission system. It contains proposed projects identified to meet the forecast requirements of BPA and other customers over the 10-year planning horizon. This section provides the proposed new facilities organized by type of project. The types of projects include the following.

- Projects required to provide load service and meet Planning Reliability Standards,
- Projects to improve operational or maintenance flexibility,
- Projects required to meet requests for transmission service,
- Projects required to meet requests for Generator Interconnection service, and
- Projects required to meet requests for Line and Load Interconnection service.

In addition to proposed projects, this section includes a listing of Recently Completed Projects for each load area or path. This category includes projects which have been completed since the previous update to the BPA Plan and includes assessment findings. Estimated Project Costs are direct costs (overheads are not included). Where official cost estimates have not been developed, the indicated project cost reflects the best information available, based on typical costs of similar projects. For study purposes, the load service areas are grouped into nine planning areas based on geographic and electrical proximity.



## 8.1 Northwest Washington Planning Area (NWWA)

The Northwest Washington (NWWA) Planning Area contains four load service areas, one intertie, and four internal transmission paths. The load areas include Seattle-Tacoma, Olympic Peninsula, Southwest Washington Coast, and Centralia-Chehalis. The five paths included in the NWWA planning area are the Northern Intertie (NI), North of Echo Lake (NOEL), South of Custer (SOC), Raver-Paul (R-P), and West of Cascades North (WOCN). The planning area extends north to the Canadian border, west to the Pacific coast, east to the Cascades Mountain range, and south to the Longview and North Oregon coast areas.

### 8.1.1 Chehalis / Centralia Area

#### Description

The Chehalis/Centralia area includes the cities of Chehalis and Centralia, Washington, and the communities within Lewis County in Washington. It consists of a 69 kV transmission loop served out of Chehalis Substation. Chehalis Substation also provides service to Lewis County PUD's Corkins 69 kV Substation and provides support to Raymond and Naselle Substations on the southwest Washington coast.

The customers in this area include:

- City of Centralia, Lewis County PUD in Lewis County of Central Washington and Tacoma Power.

The load area is served by the following major transmission paths or lines:

- Chehalis- Olympia 230 kV line 1
- Chehalis- Covington 230 kV line 1
- Chehalis-Raymond 115 kV line 1

#### Area Peak Load Forecast

Centralia - Chehalis Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
178	267	178	267

## Proposed Plans of Service

### Silver Creek Substation Reinforcements

- Description: This project adds a 230 kV breaker to separate the east and west 230 kV busses and adds a 69 kV circuit breaker on the low side of the 230/69 kV transformer.
- Purpose: This project is not required to meet TPL performance requirements, but will improve operational and maintenance flexibility.. This project is identified as a regional need.
- Estimated Cost: \$11,300,000
- Expected Energization: 2028

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.1.2 Olympic Peninsula Area

#### Description

The Olympic Peninsula in Washington State is a long radial system extending about 110 miles from BPA's Olympia Substation northwest to BPA's Port Angeles substation. This area includes the Olympic Peninsula north and west of Olympia. Included within this area are Clallam, Mason, Kitsap, and the western portion of Jefferson counties. The primary communities served include Shelton, Bremerton, and Port Angeles, as well as the US Navy in the Bremerton area. The smaller communities include Potlatch, Hoodsport, Quilcene, Fairmount, Duckabush, and Sequim.

The customers in this area include:

- Puget Sound Energy
- City of Port Angeles
- Clallam County Public Utility District
- Mason Public Utility District 1 and 3
- US Navy

The load area is served by the following major transmission paths or lines:

- Satsop-Shelton 230 kV line
- Three Olympia-Shelton 230 kV lines

- Two Olympia-Shelton 115 kV lines

### Area Peak Load Forecast

Olympic Peninsula Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
812	1330	847	1354

### Proposed Plans of Service

#### Kitsap 115 kV Shunt Capacitor Relocation

- Description: This project moves one group of 115 kV shunt capacitors from the south bus to the north bus section at Kitsap substation.
- Purpose: This project is required to maintain voltage schedules on the Kitsap Peninsula transmission system.
- Estimated Cost: \$4,000,000
- Expected Energization: 2029

#### Rebuild Shelton -Fairmount #1 115 kV line

- Description: A full rebuild of the Shelton-Fairmount #1 115 kV line to increase to the MOT to 100° C.
- Purpose: This project is not required as a corrective action plan, but will improve operational flexibility.
- Estimated Cost: TBD
- Expected Energization: Tentatively expected by 2029

### Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.1.3 Seattle/Tacoma/Olympia Area

#### Description

The Seattle/Tacoma/Olympia area is in northwestern Washington State and has a large footprint, spanning from Bellingham and the Canadian border, all the way south to the Tacoma/Olympia metro area, and spans east from the Puget Sound to the foothills of the Cascade Mountains. The Seattle/Tacoma load area can be divided into two sub-areas: Seattle/Bellingham/Everett and Tacoma/Olympia. It is the largest load area in the entire Pacific Northwest and one of the largest load areas in the entire WECC Interconnected System. It includes major metropolitan areas surrounding North Tacoma, Greater Seattle Metro Area, Everett, and Bellingham. The area includes Pierce, Thurston, North Lewis, and South King counties. It is bordered on the north by Canada and on the south by Olympia. It is bordered on the east by the Cascade Mountains and on the west by the Puget Sound. To the north, the Seattle metropolitan area includes Blaine, Bellingham, Sedro Woolley, and Mount Vernon and to the south the Seattle metropolitan area includes Puyallup and Olympia.

The customers in this area include:

- Whatcom County Public Utility District (WPUD)
- Puget Sound Energy (PSE)
- Seattle City Light (SCL)
- Snohomish County Public Utility District (SPUD)
- Tacoma Power Utilities (TPU)
- Alder Mutual Light Co. (Alder)
- City of Eatonville (COE)
- City of Milton (Milton)
- City of Steilacoom (COS)
- Elmhurst Light and Power (EL&P)
- Lakeview Light and Power (LL&P)
- Ohop Mutual Light (OML)
- Parkland Light and Power (PL&P)
- Peninsula Light (PI)

The load area is served by the following major transmission paths or lines:

- From the north by the Northwest-British Columbia path (or Northern Intertie)
- From the east by the West of Cascades North path
- From the south by the Raver-Paul path
- From the west by the Satsop-Olympia 230 kV and Satsop-Paul 500 kV lines

Major customers served in this area include Puget Sound Energy (PSE), Seattle City Light (SCL), Snohomish County PUD (SNPD), Tacoma Power Utilities, and Whatcom County PUD. This area has a large amount of local generation including thermal plants (over 1,400 MW) and hydro plants (approximately 975 MW) with a combined total of more than 2,300 MW.

### **Area Peak Load Forecast**

<b>Seattle – Tacoma - Olympia Area Load</b>			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
7994	9678	8656	10112

### **Proposed Plans of Service**

#### **Maple Valley 230 kV Shunt Reactor**

- Description: This project adds a 180 MVAR 230 kV reactor with an associated circuit breaker Disconnect Switch and Arrester at the Maple Valley Substation.
- Purpose: This project improves reliability for the Puget Sound load area.
- Estimated Cost: \$7,800,000
- Expected Energization: 2028

#### **Monroe-Novelty 230 kV Line Upgrade**

- Description: This project upgrades the Monroe-Novelty 230 kV line from 60 to at least 80-degree Celsius.
- Purpose: This project improves reliability for the Puget Sound load area.
- Estimated Cost: \$2,500,000
- Expected Energization: 2028

### **Sno-King 230/115 kV Bank #3 Power Circuit Breaker Bushing CTs**

- Description: This project upgrades circuit breaker bushing current transformer for Sno-King 230/115 kV transformer Bank.
- Purpose: The 2025 SA has identified Sno-King 230/115 kV bank #3 heavy winter rating is limited to 318.6 MVA which is based on a circuit breaker bushing current transformer as the limiting element and this project is required to meet NERC TPL performance requirements.
- Estimated Cost: TBD
- Expected Energization: TBD

### **Covington 500/230 kV banks 4 and 5 upgrade**

- Description: Both transformer banks will be upgraded to 1300 MVA through an AC Sustain Program, along with an upgrade of the #1 230 kV substation tie-line conductor associated with bank 4.
- Purpose: This project is required to support load growth in the Puget Sound area.
- Estimated Cost: TBD
- Energization: The transformers expected energization date is 2027.

### **Snohomish 230/115 kV Banks Replacement**

- Description: Three Snohomish 230 /115 kV transformer banks will be upgraded to 300 MVA 230/115 kV transformers.
- Purpose: This project is not required to meet NERC TPL-001-5.1 performance requirements in the near term.
- Estimated Cost: TBD
- Energization: The transformers expected energization date is 2027.

### **Recently Completed Plans of Service**

#### **Raver 500/230 kV Transformer (PSANI)**

- Description: This project added a 1300 MVA, 500/230 kV transformer at Raver Substation. This project was part of the overall Puget Sound Area/Northern Intertie (PSANI) Regional Reinforcement Plan. This was a joint project between participating utilities in the Puget Sound area.
- Purpose: This project is required to support load growth in the Puget Sound area.
- Energization: The transformer was energized in 2021, and the rest of the project was energized in 2024.

### **6.1.4 Southwest Washington Coast Area**

#### **Description**

The Southwest Washington Coast Load Area includes all lines and substations from the I-5 corridor west to the Pacific Ocean and north of Chehalis to Aberdeen and Olympia substations. The area is comprised of Wahkiakum County, Pacific County, western Lewis County, and southern Grays Harbor County in Washington. It is bordered on the east by Interstate 5 and the west by the Pacific Ocean. It is bordered on the north by the Olympic National Forest and on the south by the Columbia River. The main communities served include Aberdeen, the Raymond/South Bend area, and the communities on the Long Beach Peninsula. Smaller communities include Cosmopolis, Pe Ell, and Naselle.

The customers in this area include:

- Grays Harbor Public Utility District (including industrial load)
- Pacific County Public Utility District No. 2
- Wahkiakum County Public Utility District
- Lewis County Public Utility District

The load area is served by the following major transmission paths or lines:

- Aberdeen-Satsop 230 kV lines 2 and 3
- Olympia-South Elma 115 kV line
- Chehalis-Raymond 115 kV line 1
- Naselle Tap to the Allston-Astoria 115 kV line 1

### Area Peak Load Forecast

Southwest Washington Coast Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
192	384	192	385

### Proposed Plans of Service

- **Naselle Shunt Capacitor Replacement** Description: This project will replace and separate the shunt capacitor sections so they can be switched separately Purpose: This project is for O&M Flexibility.
- Estimated Cost: TBD
- Expected Energization: 2028

### South Elma 115 kV Substation Addition

- Description: This project would install a 30 MVAR shunt capacitor at Grays Harbor PUD's South Elma 115 kV Substation.
- Purpose: This project is a corrective action plan required to meet compliance with NERC TPL-001-5.1.
- Estimated Cost: TBD
- Expected Energization: TBD

### Aberdeen - Aberdeen Tap to Satsop Park – Cosmopolis 115 KV Line Upgrade

- Description: Rebuild the section between Aberdeen Tap and Structure 1/3 (0.06 mi) to increase the line's capacity.

- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirement and to maintain reliable load service to the Southwest Washington Coast area.
- Estimated Cost: \$1,172,000
- Expected Energization: 2028

## Recently Completed Plans of Service

### **South Elma-Satsop Park No. 1 Line (Remove Impairments)**

- Description: This project will upgrade the line to increase the rating to a maximum operating temperature (MOT) of 100°C.
- Purpose: This project is required to maintain reliable load service to the Southwest Washington Coast area.
- Project Status: Completed 2024

### **Satsop Park-Cosmopolis #1 115 kV line (Remove Impairments)**

- Description: This project will upgrade the line to increase the rating to a maximum operating temperature (MOT) of 100°C.
- Purpose: This project is required to maintain reliable load service to the Southwest Washington Coast area.
- Project Status: Completed 2024

## 8.2 Willamette Valley & Southwest Washington Planning Area

The Willamette Valley Southwest Washington (WILSWA) Planning Area spans western Washington from Longview to Vancouver, and western Oregon from Astoria to Salem. WILSWA contains 4 load areas (Longview, North Oregon Coast, Portland, and Vancouver). Customers include Portland General Electric (PGE), PacifiCorp (PAC), Cowlitz County PUD, Clark County PUD, North Pacific Paper Company (NORPAC), Columbia River PUD (CRPUD), Tillamook PUD (TPUD), City of McMinnville, and City of Forest Grove.

### 8.2.1 Longview Area

This area includes Cowlitz County in Washington State. The major population areas include Longview, Washington as well as the communities of Kelso, Kalama, Castle Rock, and Woodland, Washington. The loads in this area include residential, commercial and a large industrial component.

The customers in this area include:

- Cowlitz County Public Utility District

The load area is served by the following major transmission paths or lines.

- Longview-Allston 230 kV lines 1, 2 and 3
- Longview-Allston 115 kV line 4
- The Chehalis-Longview 230 kV lines 1 and 2
- Ross-Lexington 230 kV line
- PAC Merwin-Cardwell 115 kV line

#### Area Peak Load Forecast

Longview Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
598	732	599	733

### **Proposed Plans of Service**

There are no proposed projects for this area.

### **Recently Completed Plans of Service**

There are no projects that have been completed in this area since the previous planning cycle.

## 8.2.2 North Oregon Coast Area

The North Oregon Coast area includes Tillamook and Clatsop counties along the Oregon Coast. It is bounded by the Clatsop and Tillamook State Forests in the east, the Pacific Ocean in the west, the Columbia River to the north, and Pacific City to the south. The population areas include Astoria, Seaside, Cannon Beach, Manzanita, Tillamook, Oceanside, Hebo, and Pacific City.

The customers in this area include:

- PacifiCorp
- Portland General Electric
- Tillamook Public Utility District
- West Oregon Electrical Coop
- Wahkiukum Public Utility District
- Clatskanie Public Utility District

The load area is served by the following major transmission paths or lines:

- Allston-Driscoll #2 115 kV line
- Clatsop 230/115 kV transformer
- Astoria-Driscoll #1 115 kV line
- Forest Grove-Tillamook #1 115 kV line
- Carlton-Tillamook #1 115 kV line
- Grand Ronde-Boyer #1 115 kV line

### Area Peak Load Forecast

North Oregon Coast Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
179	289	197	284

## Proposed Plans of Service

### High-Side Breaker and Switchgear Associated with the Clatsop Transformer Replacement

- Description: This project adds a 230 kV 3000-amp breaker, BFR and three 2000 amp disconnect switches at Clatsop substation.
- Purpose: This project will improve operations and maintenance flexibility at Clatsop.
- Estimated Cost: \$1,600,000
- Expected Energization: 2027

### Clatsop 230/115 kV Transformer Upgrade

- Description: Upgrade the Clatsop 230/115 kV transformer to a higher MVA size.
- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirement
- Estimated Cost: TBD
- Expected Energization: TBD

## Recently Completed Plans of Service

### Astoria-Driscoll 115-kV transmission line Rebuild

- Description: Rebuild Astoria-Driscoll 115-kV transmission line.
- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirement
- Project Status: Completed

### 8.2.3 Portland Area

The Portland Load Area is in northwestern Oregon and covers loads in the counties of Clackamas, Columbia, Multnomah, and Washington. It includes major metropolitan communities surrounding the greater Portland Metro area, including Troutdale, Gresham, Sandy, Beaverton, Hillsboro, Tigard, Tualatin, Oregon City, and Wilsonville. The Portland area extends north to the Columbia River and south to Salem, Oregon. It extends west to Tigard, Oregon and east to the Cascade Mountain range. Loads are primarily residential and commercial with a smaller industrial component. Recent history of loads in this area has become dual peaking seasons (winter loads are slightly higher than summer); however, the summer peak is forecast to surpass the winter peak within the 10-year Planning Horizon.

The Portland area transmission system serves PacifiCorp (PAC) in North and East Portland and Portland General Electric (PGE) customers located in Multnomah, Clackamas, and Washington

counties in Northern Oregon. The Portland load service areas are served via four major flow gates in Southwest Washington and Northwest Oregon: Keeler-Pearl, South of Allston (SOA), Paul-Allston, and West of Cascades South (WOCS).

The customers in this area include:

- Portland General Electric (PGE)
- PacifiCorp (PAC)
- City of Forest Grove
- Western Oregon Electric Coop.
- Columbia River Public Utility District
- McMinnville Water and Light

The load area is served by the following major transmission paths or lines:

- From the north by the Paul-Allston path
- From the south by the Pearl-Ostrander and Pearl-Marion 500 kV lines
- From the east by the West of Cascades South path

### Area Peak Load Forecast

Portland Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
5862	5457	6825	6137

### Proposed Plans of Service

#### Forest Grove – McMinnville 115 kV Line Upgrade

- Description: This project upgrades the Forest Grove – McMinnville 115 kV line.
- Purpose: This project improves operations and maintenance flexibility.
- Estimated Cost: \$1,800,000
- Expected Energization: 2026

#### Carlton Upgrades

- Description: This project adds four additional circuit breakers at Carlton substation: two each at the 115 and 230 kV buses. The Forest Grove–McMinnville 115kV line will be looped into the Carlton 115 kV bus creating the Forest Grove–Carlton and Carlton–McMinnville 115 kV lines.
- Purpose: This project improves operations and maintenance flexibility. This project is identified as a regional need.
- Estimated Cost: \$19,000,000
- Expected Energization: 2026

#### **Troutdale 230 kV Series Bus Sectionalizing Breaker Addition**

- Description: This project adds a new 230 kV bus sectionalizing breaker at Troutdale Substation in series with the existing sectionalizing breaker.
- Purpose: This project is needed to meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: \$3,490,000
- Expected Energization: 2027

#### **Keeler 230 kV Bus Sectionalizing Breaker Addition (L0452)**

- Description: This project adds a 230 kV bus sectionalizing breaker at Keeler Substation.
- Purpose: This project is needed to meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: \$11,530,000 (This estimate includes other sustain work which is being coordinated with the bus sectionalizing breaker addition.)
- Expected Energization: 2029

#### **Also Listed in the West of Cascades South Path Section**

#### **Pearl-Sherwood 230 kV Corridor Reconfiguration and Series Bus Sectionalizing Breaker Addition**

- Description: This will be a joint project with PGE. It includes splitting the existing BPA/PGE Pearl-Sherwood #1 and #2 230 kV jumpered circuits and terminates them into separate bays at Pearl and Sherwood. It also splits the existing BPA/PGE Pearl-McLoughlin-Sherwood 230 kV 3-terminal line into a new Pearl-Sherwood #3

230 kV line and a new Pearl-McLoughlin-Sherwood 230 kV three terminal line. This project will also add a new 230 kV series bus sectionalizing breaker at Pearl Substation.

Purpose: This project is needed to meet NERC TPL-001-5.1 performance requirements and maintain reliable load service to the Portland Area.

- Estimated Cost: \$9,400,000
- Expected Energization: line reconfiguration 2026 and sectionalizing breaker 2028

#### **Also listed in the South of Allston Path Section**

#### **Keeler 500 kV Expansion and Transformer Addition**

- Description: This project will add 500 kV breakers at Keeler substation to reconfigure the Keeler 500 kV bus layout into a double-breaker-double-bus arrangement. This project also adds a second 500/230 kV Transformer bank at Keeler substation.
- Purpose: This project will maintain reliable load service in the Portland area and improve operations and maintenance flexibility for the South of Allston path.
- Estimated Cost: \$36,000,000
- Expected Energization: 2031

#### **Recently Completed Plans of Service**

#### **St. Johns 230/115 kV Low-Side Line Section (Remove Impairments)**

- Description: This project will upgrade a recently discovered line section impairment on the low side St. Johns 230/115 kV transformer tie-line. This project will upgrade a few hundred feet of line section where it goes from the 115 kV side of the transformer to the 115 kV bus.
- Purpose: This project is required to maintain reliable load service to the area.
- Project Status: Completed

### **8.2.4 Vancouver Area**

The Vancouver area transmission system serves customers in Clark County in Southwest Washington. This area extends north to the border of the Longview load service area and east to the Cascade Mountain Range. It is bordered on the south and west by the Columbia River. This includes the greater Vancouver, Washington area and the communities of Washougal, Camas, Ridgefield, La Center, and Battleground. Loads are primarily residential and commercial with a smaller industrial component.

The customers in this area include:

- Clark Public Utilities (Clark)
- PacifiCorp (PAC)

The lines serving the area include:

- North Bonneville-Ross 230 kV lines 1 and 2
- McNary-Ross 345 kV line
- Longview-Lexington-Ross 230 kV line
- Bonneville-Alcoa 115 kV line
- Bonneville-Sifton-Ross 115 kV line
- PAC Merwin-Cherry Grove-Hazel Dell-St Johns 115 kV line
- PAC/Clark Troutdale-Runyan-Sifton 115 kV line

### **Area Peak Load Forecast**

Vancouver Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
985	1067	1042	1133

### **Proposed Plans of Service**

There are no proposed plans of service for this area.

### **Recently Completed Plans of Service**

There are no projects that have been completed in this area since the previous planning cycle.

## 8.3 Southwest Oregon Planning Area (SWOR)

The Southwest Oregon (SWOR) Planning Area covers the Eugene, Salem/Albany, and South Oregon Coast load areas. All load areas within this Planning Area are historically peak in the winter. The historical peak winter loads for Eugene, Salem/Albany, and South Oregon Coast load areas are 896 MW, 895 MW, and 467 MW, respectively. Local generation in the area includes hydroelectric facilities along the eastern Willamette Valley and cogeneration plants.

### 8.3.1 Eugene Area

The Eugene Area includes the cities of Eugene and Springfield in western Oregon as well as the surrounding communities. This load area includes the Central Willamette Valley in Oregon's Lane County. The boundary runs by the Willamette National Forest in the east, the coast range in the west, the Salem/Albany load area to the north, and the South Oregon Coast area to the south and west of Eugene. The major population areas include cities of Eugene and Springfield, and the communities of Cheshire, Junction City, Harrisburg, Walternate, Pleasant Hill and Oakridge. The Eugene area load is winter peaking, primarily driven by residential and commercial heating loads, though industrial loads also exist in the area such as wood product mills.

The customers in this area include:

- PacifiCorp (PAC)
- Eugene Water and Electric Board (EWEB)
- Springfield Utility Board (SUB)
- Emerald Public Utility District (Emerald)
- Blachly-Lane, Lane Electric, Douglas Electric, Coos-Curry, and Consumers Power serving the rural areas.

The load area is served by the following major transmission paths or lines:

- From the Marion-Alvey 500 kV line and Marion-Lane 500 kV line
- From the south by the Alvey-Dixonville 500 kV line

### Area Peak Load Forecast

Eugene Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
720	916	742	945

### Proposed Plans of Service

#### Lookout Point – Alvey No. 1 and 2 Transfer Trip Addition

- Description: Installation of a Transfer Trip on the Alvey – Lookup 115 kV Lines 1 and 2 is needed to maintain stability for the local generation in the event of faults near the Alvey Substation.
- Purpose: This project is required to maintain reliable load service to the Eugene load area.
- Estimated Cost: \$3,000,000
- Expected Energization: 2026

#### Alvey – Dillard Tap 115 kV Line Rebuild

- Description: This project rebuilds the first 3.3 miles of the Alvey-Eugene 115 kV line.
- Purpose: This project is required to maintain reliable load service to the Eugene load area.
- Estimated Cost: \$1,300,000
- Expected Energization: 2028

### Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.3.2 Salem / Albany Area

The Salem/Albany load area serves the Central Willamette Valley between the Portland and Eugene areas to the north and south, respectively. The area includes the cities Salem, Albany, and Corvallis, and the smaller communities of Monmouth, Independence, Silverton, Stayton, and Lebanon. Customers served include Portland General Electric (PGE), PacifiCorp (PAC), Salem Electric Cooperative (SEC), Consumers Power Inc. (CPI), Emerald PUD (EPUD), City of Monmouth (COM), and the U.S. Bureau of Mines located in Albany (DOE).

The customers in this area include:

- Portland General Electric in the Salem Area
- PacifiCorp in the Albany, Corvallis, Lebanon Areas
- City of Monmouth
- U.S. Bureau of Mines located in Albany, Oregon
- Western Oregon, Salem Electric, and Consumers Power Inc. Emerald PUC serving the rural areas.

The load area is served by the following major transmission paths or lines:

- From the east by the Big Eddy-Chemawa 230 kV line
- From the north by the (PGE) McLoughlin-Bethel 230 kV line and the Pearl-Marion 500 kV line 1

### Area Peak Load Forecast

Salem - Albany Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
1077	983	1235	1120

### Proposed Plans of Service

#### Chemawa 230/115 kV Transformer Upgrade -

- Description: Upgrade the Chemawa 230/115 kV transformer to a 300 MVA size.
- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirement
- Estimated Cost: TBD
- Expected Energization: TBD

#### Santiam 500/230 kV Bank #4 -

- Description: The Marion – Santiam 500 kV transformer terminated line is limited by the 230 kV bus PCB and disconnect.
- Purpose: This project upgrades 230 kV bus PCB and disconnect to meet NERC TPL-001-5.1 performance.
- Estimated Cost: TBD
- Expected Energization: TBD

#### Lebanon 230/115 kV Transformer Addition -

- Description: Add a new Lebanon 230/115 kV transformer to connect the Santiam – Alvey #1 230 kV line into Lebanon substation to provide voltage support and alleviate overloads.
- Purpose: This project adds a new transformer to meet NERC TPL-001-5.1 performance requirement

- Estimated Cost: TBD
- Expected Energization: TBD

### Recently Completed Plans of Service

There are no projects that have been completed in the area since the previous planning cycle.

### 8.3.3 South Oregon Coast Area

The South Oregon Coast load area includes the communities of Newport, Waldport, Florence, Reedsport, Coos Bay, Coquille, Bandon, Myrtle Point, Gold Beach, Port Orford, and south to Brookings. The load area is bounded by the north Oregon Coast to the north and the Salem-Albany and Eugene areas to the east and north.

The customers in this area include:

- PacifiCorp (PAC)
- Coos Curry Cooperative
- City of Bandon
- Douglas Electric Coop
- Central Lincoln Public Utility District

The load area is served by the following major transmission paths or lines:

- Lane-Wendson 230 kV line 2
- Alvey-Fairview 230 kV line 1
- Reston-Fairview 230 kV line 2
- Fairview-Rogue 230 kV line 1
- PAC Fairview-Isthmus 230 kV line 2
- Santiam-Toledo 230 kV line 1

### Area Peak Load Forecast

South Oregon Coast Area Load			
Five-Year Load (MW), 2029		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
291	490	306	494

## Proposed Plans of Service

There are currently no BPA projects planned for the South Oregon Coast area that are required to meet NERC TPL-001-5.1 performance requirements within the near and long-term planning horizon.

## Recently Completed Plans of Service

### Toledo 69 kV and 230 kV Bus Tie Breaker Additions (Combined with the project below.)

- Description: This project adds a 69 kV bus tie breaker and a 230 kV bus tie breaker at Toledo Substation.
- Purpose: This project improves operations and maintenance flexibility at Toledo. This project is identified as a regional need.
- Project Status: Completed in 2025

### Wendson 115 kV Bus Tie Breaker Addition (Combined with the project above.)

- Description: This project adds a 115 kV bus tie breaker at Wendson Substation.
- Purpose: This project improves operations and maintenance flexibility at Wendson.
- Project Status: Completed in 2025

## 8.4 Northern Planning Area

The Northern Planning Area contains three load areas and one internal transmission path. The load areas are Klickitat County, Mid-Columbia, and Okanagan. The internal path is North of Hanford (NOH). The NOH path is bi-directional (north to south and south to north) and is adjacent to the Northern area 230 kV sub-grid system. The planning area extends north to the Canadian border, west to the Cascade Mountains, east to the Spokane area, and south to the Tri-Cities area. Customers in the Planning area include Chelan County PUD, Douglas County PUD, Grant County PUD, PacifiCorp, Avista, Puget Sound Energy, Okanagan PUD, Okanagan Cooperative, Nespelem Valley Electric, and Ferry County PUD.

### Regional Need

### 8.4.1 Mid-Columbia Area

The Mid-Columbia (Mid-C) Load Area stretches over 100 miles along the Columbia River in Central Washington, from Chelan and Douglas County in the north to Grant County in the east and Yakima County in the west. The Mid-C load area is divided into three sub-areas: west, north, and east. To the west is the Yakima County load served by PacifiCorp, and load served by BPA customers in the Ellensburg and surrounding area (load served by the Columbia-Ellensburg, Ellensburg-Moxee, and Moxee-Midway 115 kV lines). To the north is load served by Douglas and Chelan County PUD. To the east is load served by Grant County PUD and a pocket of Avista load located in Central Washington connected to Chelan and Grant PUD.

The customers in this area include:

- Chelan County PUD (Chelan)
- Grant County PUD (Grant)
- Douglas County PUD (Douglas)
- Avista energy (Avista)
- Kittitas County PUD (Kittitas)
- City of Ellensburg
- Benton REA (BREA)
- PacifiCorp (PAC)

The load area is served by the following major transmission paths or lines:

- From the northeast by two Grand Coulee-Columbia 230 kV lines, a Grand Coulee-Rocky Ford-Midway 230 kV line and a Grand Coulee-Midway 230 kV line
- From the south by the Midway-Big Eddy and the Midway-North Bonneville 230 kV lines

#### Area Peak Load Forecast

Mid-Columbia Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
3796	4152	3883	4450

## Proposed Plans of Service

### **Columbia 115 KV Breaker(B-400) Free Standing Current Transformer (C05409) Upgrade**

- Description: Upgrade free-standing current transformer (BCT) on breaker B-400 at Columbia 115kV switchyard
- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: TBD
- Energization: TBD

### **Valhalla B-288 Bushing Current Transformer (BCT) #2 Upgrade**

- Description: Upgrade the 1200A/239MVA Bushing Current Transformer (BCT) on breaker B-288 on the Valhalla -McKennzie #1 115 kV line at Valhalla 115kV switchyard to 2000A/398 MVA BCT.
- Purpose: This project is required to meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: TBD
- Energization: TBD

### **Ellensburg 115 kV Shunt Capacitor Expansion**

- Description: Install Capacitor Groups totaling 45 MVAR at Ellensburg 115kV substation
- Purpose: This project is required to alleviate post-contingency voltage deficiencies and meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: TBD
- Energization: TBD

### **Grand Coulee 230 kV Fault reduction Project**

- Description: Install back-to-back sectionalizing breakers between Coulee 230 kV bus section 1 and 2
- Purpose: This project is required to eliminate bus sectionalizing breaker failure between bus sections #1 and #2 and meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: This project is to be funded by US Bureau of Reclamation
- Energization: 2027

## Recently Completed Plans of Service

### Northern Mid-Columbia Area Reinforcement

- Description: This is a joint project between BPA, Grant PUD, Douglas PUD, and Chelan PUD. This project will result in a new Columbia-Rapids 230 kV line.
- Purpose: This project is required to maintain reliable load service to the Northern Mid-Columbia area. This project is identified as a regional need.
- Project Status: Completed

### Columbia 230 kV Bus Tie and Bus Sectionalizing Breaker Addition

**(Combined with project above.)**

- Description: This project adds a new 230 kV bus tie breaker and 230 kV bus sectionalizing breaker at Columbia Substation.
- Purpose: This project improves operational and maintenance flexibility at Columbia Substation.
- Project Status: Completed

## 8.4.2 Okanogan Area

This area includes the Okanogan Valley area of north central Washington including the communities of Omak, Brewster, Bridgeport, Winthrop, Twisp, Pateros, Tonasket, and Okanogan.

The customers in this area include:

- Okanogan Public Utility District
- Okanogan Cooperative
- Douglas Public Utility District (Douglas)
- Nespelem Valley Electric
- Ferry County Public Utility District

The load area is served by the following major transmission paths or lines:

- Chief Joseph-East Omak #1 230 kV line
- Grand Coulee-Okanogan #2 115 kV line
- Grand Coulee-Foster Creek #1 115 kV line
- Wells-Foster Creek 115 kV line (Douglas)

## Area Peak Load Forecast

Okanogan Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
183	248	188	254

## Proposed Plans of Service

### East Omak 115kV Shunt Capacitor Expansion

- Description: Install two Capacitor Groups totaling 28.8 MVAR at East Omak 115kV substation
- Purpose: This project is required to alleviate post-contingency voltage deficiencies and meet NERC TPL-001-5.1 performance requirements.
- Estimated Cost: TBD
- Energization: TBD

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

## 8.5 Central Planning Area

The Central Planning Area covers south central and southeast Washington, north central and northeast Oregon, and adjacent areas in western Idaho. This includes the major cities of Richland, Kennewick, Pasco, Pullman, and Walla Walla in Washington, Pendleton, Hermiston, La Grande, and Umatilla in Oregon, and Lewiston and Moscow in Idaho along with the surrounding areas.

### 8.5.1 Pendleton / La Grande Area

This area includes the eastern Oregon communities of Pendleton and La Grande. The Pendleton/La Grande load area is in northeastern Oregon and extends east to the Idaho border and north to the Columbia River.

The customers in this area include:

- Oregon Trail Electric Cooperative
- PacifiCorp
- Umatilla Electric Cooperative
- Columbia Power Cooperative Association
- Columbia Basin Electric Cooperative

The load area is served by the following major transmission paths or lines:

- From the east by the LaGrande-(IPC) North Powder 230 kV line
- From the west by the McNary-Roundup 230 kV line

#### Area Peak Load Forecast

Pendleton - La Grande Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
143	133	143	134

#### Proposed Plans of Service

There are currently no BPA projects planned for the Pendleton / LaGrande area that are required to meet NERC TPL-001-5.1 performance requirements over the planning horizon

#### Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.5.2 Tri-Cities Area

The Tri-Cities/Boardman Load Area study covers loads in the Benton and Franklin counties of Washington State, and the western portion of Walla Walla County. It includes the cities of Pasco, Kennewick, Richland, Boardman, and surrounding communities. The customers served in this area include Benton County PUD, Benton REA, Big Bend Electric Co-Op, City of Richland, Columbia REA, Franklin County PUD, South Columbia Basin Irrigation District, and DOE Richland.

The customers in this area include:

- Benton County Public Utility District
- Benton Rural Electric Association
- Big Bend Electric Cooperative
- City of Richland
- Columbia Rural Electric Association
- Franklin County Public Utility District
- U.S. Bureau of Reclamation (South Columbia Basin Irrigation District)
- U.S. Department of Energy (Richland Operations)

The load area is served by the following major transmission paths or lines:

- From the east by:
  - the Lower Monumental-McNary 500 kV line tapped at Sacajawea with a 500/115 kV transformer.
- From the north by:
  - the Midway-Benton 230 kV line and Benton 230/115 kV transformer
  - the Midway-Benton 115 kV line
  - the Midway-Ashe 230 kV lines through Hanford, the Ashe-White Bluffs 230 kV line, and White Bluffs 230/115 kV transformer
- From the south by:
  - the McNary-Franklin 230 kV line and Franklin 230/115 kV transformer
  - the McNary-Badger Canyon 115 kV line
  - the Horse Heaven 230/115 kV transformer
- From the west by:
  - the Grandview-Red Mountain 115 kV line

## Area Peak Load Forecast

Tri-Cities Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
1525	1065	1558	1100

## Proposed Plans of Service

### Richland-Stevens Drive 115 kV Line

- Description: This project adds a new 115 kV line terminal and three miles of new 115 kV line.
- Purpose: This upgrade is needed to provide reliable load service to the Tri-Cities area. This project is identified as a regional need.
- Estimated Cost: \$12,600,000
- Expected Energization: Spring 2027

### South Tri-Cities Reinforcement Webber Canyon (G0558)

- Description: The plan of service loops the Ashe-Marion 500 kV line into a new Webber Canyon substation. A new Webber Canyon 500/115 kV transformer then connects 17 miles of 115 kV line to Badger Canyon substation.
- Purpose: This upgrade is needed to provide reliable load service to the Tri-Cities area. This project is identified as a regional need.
- Estimated Cost: \$105,800,000

Expected Energization: Spring 2028

### Sacajawea to Ice Harbor-Franklin #1

- Description: This project will run a half-mile line from Sacajawea to the Ice Harbor-Franklin #1 115 kV line creating a 3-terminal line, parallel to the Ice Harbor-Sacajawea-Franklin #2 115 kV line.

- Purpose: The project addresses overload conditions on the parallel #2 line. This project was identified as a corrective action in the 2025 NERC TPL system assessment study.
- Estimated Cost: TBD
- Expected Cost: TBD

### Recently Completed Plans of Service

#### **McNary-Paterson Tap 115 kV Line.**

- Description: This project adds a new 115 kV PCB at McNary 115 kV substation and adds approximately two miles of new 115 kV line.
- Purpose: This upgrade is needed to provide reliable load service to the Tri-Cities area. This project is identified as a regional need.
- Project Status: Completed

#### **Red Mountain – Horn Rapids 115 kV Line Reconstructor**

- Description: This project is to reconductor the Red Mountain – Horn Rapids 115 kV section of BPA's Red Mountain – White Bluffs 115 kV transmission line to mitigate a bottleneck and maintain reliability load service.
- Purpose: This upgrade is needed to provide reliable load service to the Tri-Cities area.
- Project Status: Completed

### 8.5.3 Umatilla - Boardman Area

The Umatilla Load Area covers loads in the Umatilla and Morrow Counties of Oregon State. It includes the cities of Hermiston, Umatilla, Boardman, and surrounding communities.

The customers served in this area include the Umatilla Electric Co-Op, Columbia Basin Electric Co-Op, and PacifiCorp. Significant generating resources in the Hermiston/Boardman area include the Hermiston Generating Plant, Horn Butte Wind Farm, and Echo Wind Farm.

The Umatilla load area is comprised of load served from McNary, Boardman, Morrow Flat, Dalreed, Hat Rock, and Cold Springs substations.

## Area Peak Load Forecast

Umatilla - Boardman Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
2873	2816	3399	3399

## Proposed Plans of Service

### **Six Mile Canyon 500/230 kV Substation Addition L0510, West of Boardman Area Reinforcement**

- Description: This project adds a 230 kV source to the west of Boardman area by looping the Ashe – Slatt 500 kV line into a new 500/230 kV substation.
- Purpose: This project is associated with load interconnection L0510 Six Mile Canyon 500/230 kV substation. This is an GERP 1.0 project.
- Estimated Cost: \$284,000,000
- Expected Energization: Mid-2028

### **Morrow Flat 230 kV Shunt Reactor Addition**

- Description: This project adds a 230 kV shunt reactor (40 MVAR) at Morrow Flat Substation.
- Purpose: This Project is required to compensate for high voltages at Morrow Flat caused by the Morrow Flat-Blue Ridge line as well as the collector system capacitance when the output of wind generation is low.
- Project Status: Cancelled

## Recently Completed Plans of Service

### **Longhorn 500/230 kV Substation Addition L0482, Boardman Area Reinforcement**

- Description: This project adds a 230 kV source to the Boardman area by looping the McNary – Coyote Springs 500 kV line into a new 500/230 kV substation, with UEC connections to the 230 kV yard.
- Purpose: This project is associated with interconnection L0482 Longhorn 500/230 kV substation.
- Project Status: Completed

### **McNary Terminal Addition L0481**

- Description: This project adds a new 230 kV line terminal at McNary substation for a new UEC connection.
- Purpose: This project is associated with interconnection L0481 McNary 230 kV Bay Addition.
- Project Status: Completed

## **8.5.4 Walla Walla Area**

The Walla Walla load area is in southeastern Washington and northeastern Oregon. This area includes the Washington city of Walla Walla and the Oregon community of Milton-Freewater to the south.

The customers in this area include:

- City of Milton-Freewater
- PacifiCorp (PAC)
- Clearwater Power Co.
- Columbia Rural Electric Association
- Inland Power and Light
- Umatilla Electric Cooperative

The load area is served by the following major transmission paths or lines:

- PAC Wanapum-Walla Walla 230 kV line
- PAC Wallula-Walla Walla 230 kV line
- IPC Walla Walla- Hurricane 230 kV line
- PAC Talbot-Walla Walla 230 kV line
- Franklin-Walla Walla 115 kV line
- Walla Walla-Tucannon River 115 kV line

The area has the following wind generating resources in the area:

- NextEra Energy Resources Stateline Wind (92 MW)
- Vansycle Ridge Wind (25 MW)
- Puget Sound Energy Hopkins Ridge Wind (157 MW)
- Infigen Combine Hills II Wind (63 MW)

### Area Peak Load Forecast

Walla Walla Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
133	111	137	121

### Proposed Plans of Service

There are no proposed projects for this area.

### Recently Completed Plans of Service

#### Tucannon River 115 kV MVAR Shunt Reactor

- Description: A 15 MVAR shunt reactor will be added at Tucannon River 115 kV substation.
- Purpose: This project is required to provide voltage control for multiple contingencies involving the Tucannon River-North Lewiston 115 kV line. This project is identified as a regional need.
- Project Status: Completed

## 8.6 Southern Planning Area

### Planning Area Description

The Southern Planning Area contains two load service areas and two interties. The load areas are Central Oregon (COR) and Northern California (NCA). The interties are the California Oregon Intertie (COI) and the Pacific Direct Current Intertie (PDCI).

#### 8.6.1 Central Oregon Area

The Central Oregon Area is located east of the Cascade Mountains and includes Redmond (to the west), Prineville (to the east), and Bend, La Pine, and Sun River (to the south).

The customers in the Central Oregon area include:

- PacifiCorp
- Central Electric Cooperative
- Midstate Electric Cooperative

The Central Oregon load area is served by the following major BPA transmission path or lines:

- Big Eddy-Redmond 230 kV line
- Two 500/230 kV transformers at Ponderosa and the BPA Ponderosa-Pilot Butte 230 kV line
- Pilot Butte – La Pine 230 kV line

#### Area Peak Load Forecast

Central Oregon Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
1030	1183	1258	1408

#### Proposed Plans of Service

##### La Pine Substation Upgrade TSEP 2016

- Description: This project will provide adequate voltage support to meet NERC Planning Criteria to mitigate losses on the Fort Rock - La Pine 115 kV line due to substantial amounts of generation being added at Fort Rock.
- Purpose: The project will accommodate new generation in the La Pine, Oregon area that is associated with transmission service requests in the 2016 TSEP.
- Estimated Cost: \$7,100,000
- Expected Energization: 2026

#### **La Pine Transformer Addition TSEP 2016**

- Description: This project will replace and relocate transformer bank no. 2. La Pine's existing 230/115 kV 100 MVA transformer will be replaced with a new 230/115 kV 300 MVA transformer.
- Purpose: The project will accommodate new generation in the La Pine, Oregon area that is associated with transmission service requests in the 2016 TSEP.
- Estimated Cost: \$11,600,000
- Expected Energization: 2027

#### **New Bonanza 500/230 kV Substation addition**

- Description: This project includes reconnecting the high side of the Ponderosa 500/230 kV transformers to the planned Bonanza substation and connecting Bonanza to BPA's Grizzly-Captain Jack and Grizzly-Summer Lake 500 kV lines. This project is a BPA GERP 2.0 project
- Purpose: This project will help alleviate thermal overloads and low voltage or potential voltage instability for several contingencies in the Redmond area and is also required as a corrective action plan to meet the NERC TPL Standard.
- Estimated Cost: TBD
- Estimated Energization: Bonanza Substation is planned to be energized in 2030.

#### **Bonanza-La Pine 230 kV line addition**

- Description: This project is a new 230 kV line between the planned Bonanza Substation and La Pine Substation.
- Purpose: This project is needed to alleviate thermal overloads and low voltage or insufficient reactive margin in the Pilot Butte area. This is a GERP 2.0 project and is also required as a corrective action plan to meet the NERC TPL Standard.
- Estimated Cost: TBD
- Estimated Energization: Bonanza Substation is planned to be energized in 2030.

### Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

## 8.6.2 Northern California Area

The Northern California (NC) load area is geographically situated on both sides of the California-Oregon border. In previous assessments it was sometimes referred to as Southern Oregon or Alturas, and it was studied as part of the Central Oregon load area. The area is a mix of BPA and PacifiCorp (PAC) owned facilities and loads. The major sources into the area can be traced to Malin, Chiloquin, and Hilltop Substations. The NC area is summer peaking with historical peak load of 112 MW. The load owners in the area include PacifiCorp and Surprise Valley Electric Cooperative. The northern end of Path 76, part of the Northwest AC Intertie, crosses the NCA cut plane.

### Area Peak Load Forecast

Northern California Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
143	94	152	94

### Proposed Plans of Service

#### Warner 115 kV +/- 100 MVAR STATCOM addition

- Description: This project will expand Warner Substation to add a +/- 100 MVAR STATCOM at Warner.
- Purpose: This project is needed to alleviate low voltage or voltage collapse in the Northern California area for several outage conditions. The Warner 115 KV STATCOM is a BPA GERP 2.0 project and is required as a corrective action plan to meet NERC TPL Standard.
- Estimated Cost: TBD
- Estimated Energization: The projected energization date is 2030.

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

## 8.7 Eastern Planning Area

The Eastern Planning Area covers portions of northwest Montana, north Idaho, and eastern Washington from Spokane to the Canadian border. The load areas within the Planning area are historically winter peaking, although the Spokane area summer loads are forecast to approach winter values in the future. Generation in this area includes hydroelectric facilities in northwest Montana, north Idaho, and northeastern Washington along with thermal generation around Spokane.

### 8.7.1 North Idaho Area

The North Idaho area encompasses northeast Bonner County and Boundary County in Idaho and western Lincoln County in Montana. The main communities are in the Sandpoint, Idaho vicinity. This area includes Newport, Washington and Priest River, Idaho to the west, Bonners Ferry and Moyie Springs to the north, Troy and Libby, Montana to the east, and the communities along the Clark Fork River in Idaho to the south.

The customers in this area include:

- Avista
- Northern Lights Electric Cooperative (NLI)
- City of Bonners Ferry (CBF)
- City of Troy
- Flathead Electric Cooperative (FEC)

The load area is served by the following major transmission paths or lines:

- Libby-Bonners Ferry 115 kV line 1
- Sand Creek-Bonners Ferry 115 kV lines 1 and 2 (currently operated as a single circuit)
- Albeni Falls-Sand Creek 115 kV line 1
- Avista Cabinet Gorge-Bronx-Sand Creek 115 kV line 1

## Area Peak Load Forecast

North Idaho Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
126	197	129	214

## Proposed Plans of Service

### **Libby Power House 1 and 2 Redundant Transfer Trip**

- Description: This project installs redundant transfer trip equipment to the Libby PH-Libby #1 and #2 lines.
- Purpose: Having redundant transfer trip equipment will help protect the transformers and generators at the Libby Power Houses and provide operations and maintenance flexibility.
- Estimated Cost: \$800,000
- Expected Energization: 2026

### **Troy Substation Expansion Project and Breaker Addition**

- Description: This project adds breakers and replaces existing disconnect switches at the Troy Substation.
- Purpose: This project will maintain reliable load service to the North Idaho area.
- Estimated Cost: \$10,000,000
- Expected Energization: 2032

### **Troy 115 kV Shunt Capacitor Addition**

- Description: This project adds shunt capacitor at Troy 115 kV station. This corrective action plan is a replacement of an existing corrective action plan that was planned to add a 12.6 MVAR shunt capacitor at Libby FEC 115 kV substation.
- Purpose: This project will maintain reliable load service to the North Idaho area and a required corrective action plan to meet NERC TPL Standard.

- Estimated Cost: TBD
- Expected Energization: 2032

### Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

## 8.7.2 Northwest Montana Area

This area covers loads in Flathead and Lincoln counties in Montana. The Northwest Montana Area includes the Flathead Valley area of northwest Montana including the communities of Kalispell and Columbia Falls.

The customers in this area include:

- Flathead Electric Cooperative
- Northwestern Energy
- Lincoln Electric Cooperative
- U.S. Bureau of Reclamation (USBR)

The Northwest Montana load area is served by the following major transmission paths or lines:

- Hungry Horse – Columbia Falls 230 kV line 1
- Hungry Horse – Conkelley 230 kV line 1
- Columbia Falls – Kalispell 115 kV line 1
- Columbia Falls – Trego 115 kV line 1
- Columbia Falls – Conkelley 230 kV line 1
- Columbia Falls – Flathead 230 kV line 1
- Libby-Conkelley 230 kV line 1

### Area Peak Load Forecast

Northwest Montana Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
365	485	386	513

## Proposed Plans of Service

### Conkelley Substation Retirement

- Description: Conkelley substation was retired in 2017, and substation facilities were removed. The planned changes include looping the Libby-Conkelley 230 kV line into Flathead substation creating a Libby-Flathead line and a 3 terminal 230 kV line between Flathead, Hungry Horse, and Columbia Falls 230 kV substations.
- Purpose: This project is needed to accommodate the retirement of Conkelley substation. This project is identified as a regional need.
- Estimated Costs: \$32,000,000
- Expected Energization: 2027

### Columbia Falls 115/34.5 kV Transformer Replacement

- Description: Replace the Columbia Falls 115/34.5 KV Transformer #1 with a new 50 MWA minimum capacity transformer.
- Purpose: This project is needed to maintain reliable load service to this area.
- Estimated Costs: \$8,500,000
- Expected Energization: TBD

### Columbia Falls 230/115 kV Transformer Bank 2 and 3 Replacements

- Description: This project upgrades the Columbia Falls 230/115kV Transformers #2 and #3.
- Purpose: This project is a corrective action plan required to alleviate overloading of one of the transformers for an outage of the other transformer to meet NERC TPL requirement.
- Estimated Costs: TBD
- Expected Energization: TBD

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.7.3 Spokane / Colville / Boundary Area

The Spokane/Colville/Boundary area includes Pend Oreille, Stevens, and Spokane County in eastern Washington State. The load area includes the greater Spokane, Washington area as well as Colville Valley to the north including the communities of Colville and Chewelah. This area also includes Newport, Washington to the east.

The customers in this area include:

- Avista
- Inland Power and Light
- West Kootenai Power and Light
- Pend Oreille PUD
- Ponderay Newsprint Company

The load area is served by the following major transmission paths or lines:

- Bell-Boundary 230 kV lines 1 and 2
- Usk-Boundary 230 kV line
- Taft Bell 500-kV line
- Bell-Lancaster 230 kV line
- Avista Lancaster-Boulder 230 kV line
- Avista Benewah-Boulder 230 kV line
- Avista Rathdrum-Boulder 230 kV line
- Grand Coulee-Bell 500 kV line
- Three Grand Coulee-Bell 230 kV lines
- Grand Coulee-Westside 230 kV line

### **Area Peak Load Forecast**

Spokane – Colville - Boundary Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
877	954	992	1164

### **Proposed Plans of Service**

There are no new projects in the Spokane – Colville -Boundary area

### **Recently Completed Plans of Service**

#### **Bell-Boundary 230 kV No. (Sacheen) Line Upgrade (Remove Impairments)**

- Description: The Boundary-Sacheen No. 1 230 kV line has been de-rated from 80°C to 60°C MOT. The line will be restored to 80°C MOT and eventually increase it to 100°C MOT
- Purpose: This project is needed to maintain reliable load service to this area.
- Project Status: Completed

## 8.8 Idaho Planning Area

The Idaho Planning Area covers two electrically and geographically separate areas. The South Idaho portion originates near Twin Falls, Idaho and extends south into northern Nevada. The second portion originates near Idaho Falls in Idaho and extends into Northwest Wyoming.

### 8.8.1 Burley Area

The Burley area is in Minidoka and Cassia counties in south central Idaho. This area includes the communities of Burley, West Burley, Riverton, Minidoka, Rupert, and Heyburn. The area load is mostly residential and irrigation. Loads peak during the summer when irrigation use is at its peak.

The customers in this area include:

- Idaho Power
- Raft River Electric Coop
- Riverside Electric
- South Side Electric
- United Electric Coop
- Wells Rural Electric
- U.S. Bureau of Reclamation
- Burley Irrigation District
- East End Mutual
- Farmers Electric
- The Cities of Albion, Burley, Declo, Heyburn, Rupert, and Minidoka
- This load area is served primarily by Idaho Power transmission facilities.

## Area Peak Load Forecast

Burley Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
250	200	267	215

## Proposed Plans of Service

### Heyburn- West Burley 138 kV line upgrade Line Upgrade

- Description: Upgrade the 4.4 miles Heyburn- West Burley 138 kV line.
- Purpose: This line upgrade is driven by load growth and a reduced rating on the line due to higher ambient temperature assumption in the summer
- Project Status: This is a Customer owned line and BPA leases the Heyburn-Burley line from the Customers in the Burley area; BPA will work with the line owners to upgrade the line.

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

## 8.8.2 Southeast Idaho / Northwest Wyoming Area

The Southeast Idaho / Northwest Wyoming Area load area includes southeast Idaho from Idaho Falls south to Soda Springs and east to Jackson, Wyoming. This area is served by Lower Valley Energy. It also includes the area from West Yellowstone, Montana south to Afton, Wyoming which is served by Fall River Electric Cooperative. This area includes the communities of Jackson, Wyoming and Driggs, Idaho.

The customers in this area include:

- Lower Valley Energy
- Fall River Electric Cooperative (FEC)
- U.S. Bureau of Reclamation (USBR)
- Utah Associated Municipal Power Systems (UAMPS)

The load area is served by the following major transmission paths or lines:

- Goshen-Drummond 161 kV line
- Goshen-Swan Valley 161 kV line
- Goshen-Palisades 115 kV line
- Lower Valley's connection from Three Mile Knoll to Hooper Springs

### Area Peak Load Forecast

Southeast Idaho - Northwest Wyoming Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
212	383	226	412

### Proposed Plans of Service

The SE Idaho area reinforcements identified in the 2025 SA include three projects.

1. Description: Rebuild Cattle Creek-Palisades and Palisades- Swan Valley 115 kV lines to 161 kV with additions of 161/115 kV transformers at Palisades and Swan Valley.
2. Description: Build a new 115 kV Targhee substation and remove 115 kV Targhee Tap, add an additional 16.5 MVAR shunt capacitor at Targhee, and reconductor the Targhee-Swan Valley and Targhee-Drummond 115 kV lines.
3. At Teton 115 kV substation add a sectionalizing breaker and a new 12.6 MVAR shunt capacitor.

Purpose: Due to increased load forecasts in this area all three reinforcements were identified to address overloads and low voltages for outage conditions.

Estimated Cost: TBD

Estimated Schedule: TBD

### Recently Completed Plans of Service

#### Spar Canyon 230 kV Reactor Addition

- Description: This project adds a 230 kV 25 MVAR shunt reactor at Spar Canyon Substation.
- Purpose: This project improves the ability to maintain voltage schedules and increases operations and maintenance flexibility at Spar Canyon.
- Estimated Cost: \$10,000,000

## 8.9 Lower Columbia Planning Area

The Lower Columbia Planning Area spans the Columbia River Gorge, from Hood River to Boardman. The Lower Columbia Area contains three load areas, Hood River/The Dalles, Fossil/De Moss, and Klickitat County PUD. Customers include PacifiCorp (PAC), Hood River Electric Co-Op, Northern Wasco County PUD (NWCPUD), Klickitat County PUD, Skamania County PUD and Wasco Electric Co-Op.

Generation in this area includes large hydro on the Federal Columbia River Power System; Bonneville, The Dalles, and John Day dams. Local wind generation in the area is primarily owned by PGE (Bigelow, Klondike) or merchant power providers (Rock Creek, PAtu, and De Moss).

Lower Columbia load areas are primarily served by the West of Slatt (WOS) path to the east; or by the Pacific DC Intertie (PDCI) and NW AC Intertie (NWACI) paths from the south. The adjacent Willamette Valley/Southwest Washington (WILSWA) planning area borders to the west, and the Boardman/Umatilla Planning area borders to the east.

### 8.9.1 Hood River / The Dalles Area

The Hood River/The Dalles area includes portions of northern Oregon and southern Washington along the Columbia River Gorge. The area spans from Bonneville Dam to the west, to The Dalles Dam to the east. It includes the communities of Cascade Locks, Hood River and The Dalles in Oregon and Stevenson, Carson, Fossil, De Moss, and Bingen in Washington.

#### Load Service Area

Note: The Hood River / The Dalles Area was reported as part of the WILSWA Planning Area in previous annual Transmission Plans.

The customers in this area (and the communities they serve) include:

- Klickitat County Public Utility District in White Salmon and Bingen
- Skamania County Public Utility District in Stevenson and Carson
- City of Cascade Locks in Cascade Locks
- PacifiCorp in Hood River
- Hood River Electric Coop in Hood River
- Northern Wasco Public Utility District in The Dalles

- USBR in The Dalles
- Wasco Electric Cooperative

The load area is served by the following major transmission paths or lines:

- Bonneville Powerhouse 1 – Alcoa 115 kV line
- Bonneville Powerhouse 1 – North Camas 115 kV line
- Bonneville Powerhouse 1 – Hood River 115 kV line
- Chenoweth 230/115 kV transformer
- Big Eddy – Quenett Creek 1 and 2 230 KV lines
- Big Eddy – The Dalles 115 kV line

### Area Peak Load Forecast

Hood River - The Dalles Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
432	445	525	535

### Proposed Plans of Service

#### Big Eddy 230 KV Bus Differential Relay Addition

- Description: This project adds a differential relay at Big Eddy 230 kV bus
- Purpose: This project is to eliminate a non-redundant component failure of a protection system failure to operate.
- Estimated Cost: TBD
- Expected Energization: TBD

#### NWCPUD's Bigg Eddy- The Dalles 115 kV upgrade

Bonneville will work with NWCPUD to upgrade their transmission line. In the interim, there is an operating procedure that can alleviate overloads on this line for outage conditions by sectionalizing at Hood River 115kV substation. This will not result in loss of load.

#### Quenett Creek Substation Addition L0380

- Description: This project adds a new Quenett substation to accommodate new industrial load in the area.
- Purpose: This project is associated with interconnection L0380. This project is identified as a regional need.
- Estimated Cost: \$57,500,000
- Expected Energization: 2028

#### **Recently Completed Plans of Service**

There are no projects that have been completed in this area since the previous planning cycle.

### **8.9.2 De Moss / Fossil Area**

This De Moss/Fossil load area spans a portion of north central Oregon, including the communities of Maupin, Tygh Valley, and Grass Valley. It encompasses Wasco and Sherman counties in Oregon.

Note: The De Moss / Fossil area was reported as part of the Central Planning area in previous annual Transmission Plans.

The customers in this area include:

- Wasco Electric Cooperative (WEC)
- Columbia Basin Electric Cooperative
- Columbia Power Cooperative Association
- PacifiCorp

The DeMoss/Fossil load area is served by the following major transmission paths or lines:

- From the north by the Big Eddy-DeMoss 115 kV line
- From the west by the Big Eddy-Redmond 230 kV line (via WEC's Maupin-Fossil 69 kV line)

## Area Peak Load Forecast

De Moss - Fossil Area Load			
Five-Year Load (MW), 2030		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
23	31	23	32

## Proposed Plans of Service

There are no proposed projects for this area.

## Recently Completed Plans of Service

There are no projects that have been completed in this area since the previous planning cycle.

### 8.9.3 Klickitat County Area

The Klickitat County area is in south central Washington and is comprised of Klickitat County PUD and various generation projects interconnected to their transmission system.

The Klickitat County PUD BES system contains two distinct regions with a normally open emergency tie line between Linden and Dooley substations. The first region interconnects generation radially to BPA's Rock Creek 500/230 kV substation. BPA's Wautoma-John Day 500 kV line is looped into Rock Creek 500 kV substation. Klickitat County PUD owns 230 kV lines from Rock Creek to Dooley, Rock Creek to White Creek, and Rock Creek to the Juniper Canyon 1 wind project that interconnects wind generation radially to Rock Creek substation.

Note: The Klickitat load area was reported as part of the Northern Planning Area in previous Transmission Plans.

Generation sources include the Windy Point, Tuolmne Wind, Dooley, Juniper Canyon, Goodnoe Hills, White Creek, and Harvest wind projects.

The second region is interconnected radially to BPA's Harvalum 230 kV substation. Harvalum substation is connected to BPA's 230 kV line that runs from McNary to Big Eddy substation. Klickitat County PUD owns the 230 kV line from Harvalum to their EE Clouse 230/115 kV substation that interconnects generation at 230 kV and serves their load at 115 kV.

Generation sources include the 303 MW Goldendale Energy Project and 50 MW Linden Wind project. Additional load is served at Lyle and Spearfish substations at 69 kV and is fed from BPA's Chenoweth 115 kV substation.

### **Area Peak Load Forecast**

Klickitat County Area Load			
Five-Year Load (MW), 2029		Ten-Year Load (MW), 2034	
Summer	Winter	Summer	Winter
59	77	61	80

### **Proposed Plans of Service**

There are no proposed projects for this area.

### **Recently Completed Plans of Service**

There are no projects that have been completed in this area since the previous planning cycle.

## 9. Transmission Needs by Path

The Bonneville Power Administration is a nonprofit federal power marketing administration based in the Pacific Northwest. BPA markets wholesale electrical power from 31 federal hydroelectric projects in the Northwest, one nonfederal nuclear plant and several small nonfederal power plants. The dams are operated by the U.S. Army Corps of Engineers and the Bureau of Reclamation. The nonfederal nuclear plant, Columbia Generating Station, is owned and operated by Energy Northwest, a joint operating agency of the state of Washington.

BPA also operates and maintains about three-fourths of the high-voltage transmission in its service territory. BPA's territory includes Idaho, Oregon, Washington, western Montana and small parts of eastern Montana, California, Nevada, Utah, and Wyoming.

The BPA transmission system is characterized primarily by hydro generation on the main stem Columbia and lower Snake River that are remote from load centers. Most of the generation is run-of-the-river hydro. In addition, there are several thermal generators located along the I-5 corridor from Seattle to Portland.

The paths and interties are studied with a variety of scenarios that reflect seasonal patterns of flows across BPA's main grid network. The following page describes the typical seasonal patterns across the main grid transmission system. Since the various system patterns occur seasonally and are dependent on weather, they do not all occur simultaneously.

### **Winter Scenario**

In the winter season, hydro and thermal generation is operated to serve peak load. The load in the Pacific Northwest typically peaks in the winter (November-February), although there are areas that also peak in the summer season (mid-June through September). The winter scenario results in high east-to-west flows on the transmission system crossing the Cascade Mountains, to deliver generation from resources located east of the Cascades, to the load centers in western Washington and western Oregon. With thermal generation located in western Washington, transfers between Seattle and Portland are low in the winter.

### **Spring Scenario**

**The spring and early summer season (March-June)** are when high hydro run-off occurs due to snow melt across the region (spring run-off scenario). During this time, water in the northern

Columbia River basin is stored behind Canadian dams, and the hydro generation along the Snake River is peaking.

Combined with moderate spring loads, the run-off scenario results in high flows across the transmission system in an east-to-west direction from northern Idaho and eastern Washington feeding the interties to California. After the spring run-off, generation along the lower Snake River drops off dramatically for the summer.

### **Summer Scenario**

**During the latter part of summer (July-September),** water that was stored in the spring is released through hydro projects in Canada. The late summer scenario results in high generation levels at hydro plants along the Columbia River. These high generation levels produce high flows across the transmission system in the north-to-south direction from the Upper Columbia and Canada and down through the system to serve load centers in Puget Sound, the Willamette Valley, and California.

### **Proposed Plans of Service**

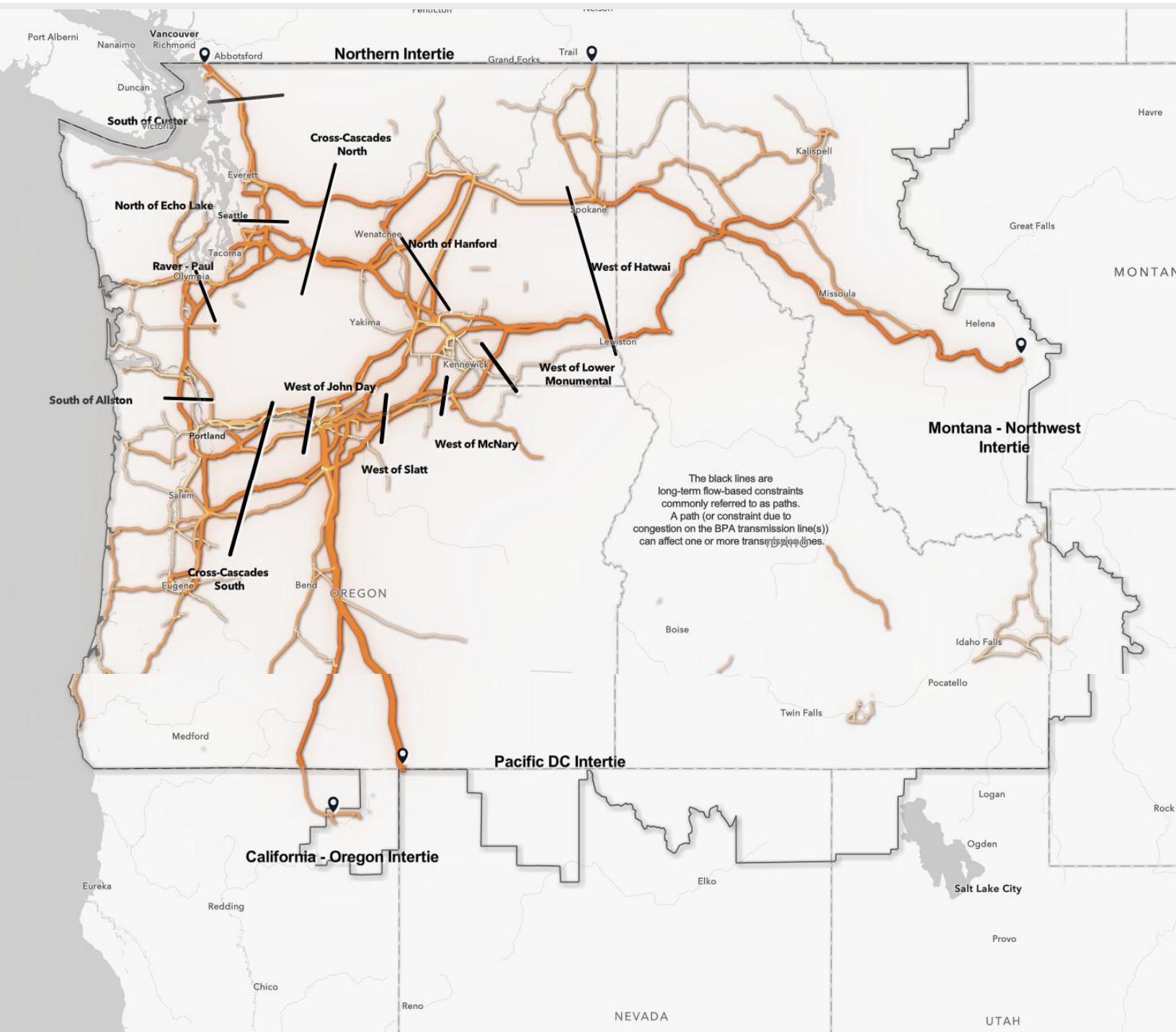
Based on firm transmission service obligations, if there are no proposed plans of service, then the path total transfer capability meets the NERC TPL-001-5.1 requirements in the near-term planning horizon.

<b>Paths</b>	
1	South of Custer
2	South of Allston
3	North of Echo Lake
4	North of Hanford
5	Raver to Paul
6	Cross Cascades North
7	Cross Cascades South
8	West of John Day
9	West of Slatt
10	West of McNary
11	West of Lower Monumental
12	West of Hatwai
13	North of Grizzly
14	North of Pearl

# Paths

Figure 10 Path Title List

The paths and interties are studied with a variety of scenarios that reflect seasonal patterns of flows across BPA's main grid network. Since the various system patterns occur seasonally and are dependent on weather, they do not all occur simultaneously.



# Paths

## Proposed Plans of Service

Figure 11 Paths Project Map



No.	Proposed Plan of Service Title	Estimated Costs	Expected Energization Date
1			
2	Keeler 500 kV Expansion and Transformer (GERP1)	\$36,000,000	2029
3	Pearl-Sherwood-McLoughlin Upgrade (GERP1)	\$9,400,000	2027
<b>West of Cascades North</b>			
4	Schultz-Raver Reconductor and Paul Capacitor TSEP 2022 (GERP1)	\$150,000,000	2029
	Schultz-Raver Series Capacitors TSEP 2022 (GERP1)	\$50,300,000	2029

Note: Regional Needs projects are identified as (RNP) and GERP 1.0 projects are (GERP1).

## 9.1 South of Custer Path

### Description

South of Custer (SOC) is a north-to-south path that connects the northern Puget Sound Area. This path is located south of Custer Substation in the Bellingham area of Washington State.

This path includes the following lines:

- Monroe-Custer 500 kV lines 1 and 2
- Custer-Bellingham 230 kV line 1
- Custer-Murray 230 kV line 1

### Proposed Plans of Service

There are no proposed projects for this path.

### Recently Completed Plans of Service

There are no completed plans of service for this path since the last planning cycle.

## 9.2 North of Echo Lake Path

### Description

North of Echo Lake (NOEL) path is a south-to-north path that connects the central Puget Sound Area (PSA).

This path includes the following lines:

- Echo Lake-Maple Valley 500 kV lines 1 and 2
- Echo Lake-Snoking-Monroe 500 kV line
- Covington-Maple Valley 230 kV line 2

### Proposed Plans of Service

There are no proposed projects for this path.

### Recently Completed Plans of Service

There are no completed plans of service for this path since the last planning cycle.

## 9.3 Raver to Paul Path

### Description

The Raver-Paul (R-P) path is located east of Tacoma, WA and spans from near Covington, WA to Centralia, WA. The critical facilities in the area are the Raver, Paul, Covington, Tacoma, Olympia, and Satsop substations. The generation projects in this area are the Centralia, Frederickson LLP, Frederickson (PSE), Grays Harbor, and Chehalis thermal generation projects. In addition, the Fredonia and Whitehorn generation projects impact the area. The load in this area is a mixture of industrial, commercial, and residential loads in Covington, WA, Tacoma, WA, Olympia, WA, and the Olympic Peninsula.

The R-P path is defined as the Raver-Paul #1 500 kV line. Typically, the R-P path sees its highest loading during late spring and early summer off-peak load hours. During late spring and early summer conditions, substantial amounts of hydro generation on-line in the Northwest and Canada, with moderate loads in the Northwest can occur simultaneously with I-5 Corridor thermal generation off-line due to maintenance schedules and economic factors. This generation pattern results in high flows across the R-P path.

This path includes the following line:

- Raver-Paul 500 kV Line 1

The customers in the area include:

- Puget Sound Energy (PSE)
- Tacoma Power
- Mason County #1 & #3 PUDs
- Jefferson County PUD
- Clallam County PUD
- City of Port Angeles
- Grays Harbor PUD

### Proposed Plans of Service

There are no proposed projects for this path.

## Recently Completed Plans of Service

There are no completed plans of service for this path since the last planning cycle.

## 9.4 West of Cascades North Path

### Description

The West of Cascades North (WOCN) Path spans the northern Cascades Mountain range in Washington State. It connects generation hubs on the Columbia River in eastern Washington to load centers in Puget Sound and western Washington. It is comprised of system elements owned by BPA and PSE and only flows in the east-to-west direction.

This path consists of the following transmission lines:

- Chief Joseph-Monroe #1 500 kV line (BPA)
- Schultz-Raver #1, #3, and #4 500 kV lines (BPA)
- Schultz-Echo Lake 500 kV line (BPA)
- Chief Joseph-Snohomish #3 and #4 345 kV lines (BPA)
- Rocky Reach-Maple Valley #1 345 kV line (BPA)
- Grand Coulee-Olympia #1 287 kV line (BPA)
- Rocky Reach-Cascade 230 kV line (PSE)
- Bettas Road-Covington #1 230 kV line (BPA)

### Proposed Plans of Service

#### Schultz-Raver Reconductor and Paul Capacitor

- Description: This project is required to enable additional transmission capacity on West of Cascades North. Both Schultz-Raver #3 and #4 500 kV lines will be reconducted; the 500 kV series capacitor on the Schultz-Raver #4 500 kV line will be upgraded to its ultimate rating to match the 500 kV series capacitor on the Schultz-Raver #3 500 kV line; a new +350/-300 MVAR STATCOM will be installed at Olympia 230 kV; a new 302 MVAR shunt capacitor bank will be installed at Paul 500 kV.
- Purpose: This project will provide capacity on the West of Cascades North path. This project is identified as GERP 1.0.
- Estimated Cost: \$150,000,000
- Expected Energization: 2032

### **Schultz-Raver Series Capacitors**

- Description: This project is required to enable additional transmission capacity on West of Cascades North. The 500 kV series capacitor on the Schultz-Raver #4 500 kV line will be upgraded to its ultimate rating to match the 500 kV series capacitor on the Schultz-Raver #3 500 kV line.
- Purpose: This project will provide capacity on the West of Cascades North path. This project is identified as GERP 1.0.
- Estimated Cost: \$50,300,000
- Expected Energization: 2029

### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## 9.5 South of Allston Path

### Description

The South of Allston (SOA) path is located along the I-5 Corridor west of the Cascade Mountains and spans from near Alston Oregon to Sherwood Oregon. The main grid facilities located in this area are the Allston, Keeler, and Pearl substations. The Southwest Washington and Northwest Oregon load service area includes the cities of Portland, Oregon and Vancouver, Washington, which include high concentrations of industrial, commercial, and residential load.

The highest flow across the SOA path occurs during peak summer load conditions combined with high north-to-south transfers from Canada through the Northwest to the Puget Sound, Portland, and California load areas. The high north-to-south flows occur due to excess generation in Canada and the Northwest and high energy demands in the Northwest and California.

This path includes the following lines:

- Keeler – Allston 500-kV
- Trojan – St. Marys 230-kV (PGE)
- Trojan – Rivergate 230-kV (PGE)
- Ross – Lexington 230-kV (rev)
- St. Helens – Allston 115-kV
- Merwin – St. Johns 115-kV (PACW)
- Seaside – Astoria 115-kV (PACW)
- Clatsop 230/115 kV (rev)

### Proposed Plans of Service

#### Keeler 500 kV Bus Expansion and Transformer Addition

- Description: This project will add 500 kV breakers at Keeler substation to reconfigure the Keeler 500 kV bus layout into a double-breaker-double-bus arrangement and a second 500/230 kV Transformer bank at Keeler substation.
- Purpose: This project will improve reliability, operations, and maintenance flexibility for the South of Allston path.
- Estimated Cost: \$36,000,000
- Expected Energization: 2029

## Recently Completed Plans of Service

There are no completed plans of service for this path since the last planning cycle.

## 9.6 West of Cascades South Path

### Description

The West of Cascades South (WOCS) path spans the Cascade Mountains in southern Washington and Northern Oregon, serving the Willamette Valley and Southwest Washington (WILSWA) area. The main grid facilities for this path include Marion, Ostrander, Knight, John Day, Wautoma, and Big Eddy substations. The WILSWA area includes the cities of Portland, Vancouver, Eugene, and Salem with high concentrations of commercial and residential load. For spring and early summer operation, high flows on the WOCS path typically occur when there is surplus hydro and wind generation east of the Cascades and low thermal generation in the Southwest Washington/Northwest Oregon area. The WOCS path only flows in the east-to-west direction.

This path includes the following lines:

- Big Eddy-Ostrander 500-kV (BPA)
- Knight-Ostrander 500 kV (BPA)
- Ashe-Marion 500 kV (BPA)
- Buckley-Marion 500 kV (BPA)
- John Day-Marion 500 kV (BPA)
- McNary-Ross 345 kV (BPA)
- Jones Canyon-Santiam 230 kV (BPA)
- Big Eddy-Chemawa 230 kV (BPA)
- Big Eddy-McLoughlin 230 kV (BPA)
- Big Eddy-Troutdale 230 kV (BPA)
- Midway-N. Bonneville 230 kV (BPA)
- Round Butte-Bethel 230 kV (PGE)

The highest flows across WOCS occurs during peak summer and winter load conditions in the WILSWA area combined with high generation east of the Cascade Mountains including hydro, wind, and thermal plants.

### **Proposed Plans of Service**

There are no proposed projects for this path.

### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## **9.7 West of Slatt Path**

### **Description**

The West of Slatt path is an east to west path that transfers power from Northeast Oregon and Southeast Washington, east of Slatt substation to the California-Oregon AC Intertie at the John Day substation, the Pacific DC Intertie at Big Eddy substation, and Northwest load centers west of the Cascade Mountains. Transfers across this path usually peak in spring or summer because of late spring and early summer hydro run off.

This path is located between Slatt and John Day Substations in Oregon. Monitoring West of Slatt (WOS) is designed to protect the Lower Columbia Basin area from high transfers caused by surplus generation of local wind, hydro, and thermal generation. The highest flows on the WOS path are due to surplus generation and are driven by commercial transfers instead of load service. The WOS and West of John Day (WOJ) paths can be impacted by West of McNary (WOM) path flows as well, since all three paths usually peak in spring or summer generation surplus conditions when commercial exports from the Pacific NW are high.

This path includes the following lines:

- Slatt-John Day 500 kV line 1
- Slatt-Buckley 500 kV line 1

### **Proposed Plans of Service**

There are no proposed projects for this path.

### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## 9.8 West of McNary Path

### Description

The West of McNary (WOM) path is an east to west path that transfers power from Northeast Oregon and Southeast Washington, east of Coyote substation, to the California-Oregon (COI) AC Intertie at John Day substation, the Pacific DC Intertie (PDCI) at Big Eddy substation and Northwest (NW) load centers west of the Cascade Mountains. Transfers across the WOM path usually peak in spring or summer because of late spring and early summer hydro run off. Transfers can also peak in winter. The WOM path is directly impacted by hydroelectric generation at the McNary and Lower Snake River dams; thermal plants at Coyote Springs, Hermiston, and Goldendale; wind plants at Jones Canyon, Walla Walla, and Central Ferry, and other renewable energy connected to the 500 kV, 230 kV and 115 kV systems at and east of Coyote substation.

This path includes the following lines:

- Coyote Springs-Slatt 500 kV line 1
- McNary-John Day 500 kV line 2
- McNary-Ross 345 kV line 1
- Jones Canyon-Santiam 230 kV line 1
- Harvalum-Big Eddy 230 kV line 1

### Proposed Plans of Service

There are no proposed projects for this path.

### Recently Completed Plans of Service

There are no completed plans of service for this path since the last planning cycle.

## 9.9 West of Hatwai Path

### West of Hatwai WECC Path 6 Description

This path is located between northern Idaho (Lewiston area) and eastern Washington. The highest flows on this path typically occur east to west during light load periods in late spring and early summer.

This path includes the following lines:

- BPA Lower Granite – BPA Hatwai 500 kV line

- BPA Grand Coulee – BPA Bell 230 kV lines 3 and 5
- BPA Grand Coulee – BPA Bell 500kV
- BPA Grand Coulee – BPA Westside 230 kV line
- BPA Creston – BPA Bell 115 kV line
- PacifiCorp Dry Creek – Talbot 230 kV line
- Avista North Lewiston – Tucannon River 115 kV line
- Avista Harrington – Odessa 115 kV line
- Avista Lind – Avista Roxboro 115 kV line
- PacifiCorp Dry Gulch 115/69 kV line

#### **Proposed Plans of Service**

There are no proposed projects for this path.

#### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## **9.10 West of Lower Monumental Path**

#### **Description**

This path is between Lower Monumental and McNary Substations. Historically, flow on the West-of-Lower Monumental path (WOLM) peaks during spring hydro run-off for both peak and off-peak hours.

This path includes the following lines:

- Lower Monumental-Ashe 500 kV line
- Lower Monumental-Hanford 500 kV line
- Lower Monumental-McNary 500 kV line

#### **Proposed Plans of Service**

There are no proposed projects for this path.

#### **Recently Completed Plans of Service**

There are no completed plans of service in this path since the last planning cycle.

## 9.11 North of Hanford Path

### Description

This path is located north of Hanford (NOH) substation between Hanford and Grand Coulee. The NOH path is in central Washington and is a bi-directional path with flows both north-to-south and south-to-north. The NOH path north-to-south peak flow occurs with high Upper Columbia generation, high Mid-Columbia generation, high I-5 Puget thermal generation, and/or high imports from Canada and lower levels on the Lower Snake River and Lower Columbia River hydro generation. High north-to-south flow is typical in the late spring and summer seasons. For thermal limitations the most critical season is summer when facility ratings are lower. The NOH south-to-north flows are dependent on a few factors: low or zero generation at the Upper Columbia hydro plants, Grand Coulee pump loads in service, low Puget Sound area generation, and high south-to-north exports to Canada. The primary season for high south-to-north flows on NOH is the in spring and less often in the winter. Higher south-to-north flows are most common during light load conditions (off peak hours).

This path includes the following lines:

- Grand Coulee-Hanford 500 kV line 1
- Schultz-Wautoma 500 kV line 1
- Vantage-Hanford 500 kV line 1

### Proposed Plans of Service

There are no proposed projects for this path.

### Recently Completed Plans of Service

There are no projects that have been completed for this path since the previous planning cycle.

## 9.12 West of John Day Path

### Description

The West of John Day path is an east west path that transfers power from Northeast Oregon and Southeast Washington, east of John Day substation to the Pacific DC Intertie at Big Eddy substation and Northwest load centers west of the Cascade Mountains. Transfers across the WOJ path usually peak in spring or summer because of late spring and early summer run off. This path is located between the John Day Substation and The Dalles Substation in

Oregon. Monitoring the West of John Day (WOJ) path is designed to protect for high transfers to Western Oregon load centers and to the northern terminal of the Pacific DC Intertie caused by surplus generation of local wind and hydro. The highest flows on the WOJ path are due to surplus generation and are driven by commercial transfers instead of load service. WOS and WOJ can be impacted by West of McNary (WOM) path flows as well, since all three paths usually peak in spring or summer generation surplus conditions when commercial exports from the Pacific NW are high.

This path includes the following lines:

- John Day-Big Eddy 500 kV line 1
- John Day-Big Eddy 500 kV line 2
- John Day-Marion 500 kV line 1

#### **Proposed Plans of Service**

There are no proposed projects for this path.

#### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## **9.13 North of Grizzly**

#### **Description**

North of Grizzly (GRZN) is a north-south path that transfers power between the Lower Columbia area and Central and Southern Oregon load areas, NWACI, and Path 75. The path is located north of Grizzly Substation and includes the three lines connecting into Grizzly from the north as well as the Maupin – Redmond #1 230 kV line. Flow on the path can be bidirectional but the path only has a north-to-south rating as of 2025. GRZN was created to help manage congestion on the Central Oregon transmission system, particularly on the system north of Grizzly Substation. The GRZN definition captures the impact of Central and Southern Oregon import, NWACI flows, and Path 75 flows, on limitations north of Grizzly Substation. The highest flows are expected when Central and Southern Oregon import is high simultaneous with high exports from the Pacific Northwest to California and Nevada via NWACI and to Idaho via Path 75. Peak flow is seen in the summer.

This path includes the following lines:

- John Day – Grizzly #1 500 kV line

- John Day – Grizzly #2 500 kV line
- Buckley – Grizzly #1 500 kV line
- Maupin – Redmond # 230 kV line

### **Proposed Plans of Service**

There are no proposed projects for this path.

### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## **9.14 North of Pearl**

### **Description**

North of Pearl (NOPE) path was introduced in 2023 to capture transmission constraints on the west side of Portland in South to North direction.

The NOPE path is defined by the following lines where positive flow is in the S>N direction and metered at the asterisked\* substation:

- Pearl\*-Keeler #1 500kV Line (BPA Owned)-positive S>N direction only
- Pearl\*-Sherwood #1 230kV Line
- Pearl\*-Sherwood #2 230kV Line
- McLoughlin-Pearl\*-Sherwood 230kV Line

When flow on Pearl-Keeler #1 500kV Line switches to negative (N>S direction), it is excluded from the overall path flow calculation. In this way, total path flow calculation is qualified to be positive in the S>N direction only.

North of Pearl path can experience high flows during high loads in Portland area (summer peak and winter peak hours) as well as periods of low thermal generation along the I5 corridor.

### **Proposed Plans of Service**

**Pearl-Sherwood-McLoughlin Upgrade TSEP 2021**

- Description: This will be a joint project with PGE. It includes splitting the existing BPA/PGE Pearl-Sherwood #1 and #2 230 kV jumpered circuits and terminates them into separate bays at Pearl and Sherwood. It also splits the existing BPA/PGE Pearl-McLoughlin-Sherwood 230 kV 3-terminal line into a new Pearl-Sherwood #3 230 kV line and a new Pearl-McLoughlin-Sherwood 230 kV three terminal line. This project will also add a new 230 kV series bus sectionalizing breaker at Pearl Substation.
- Purpose: This project is required to maintain reliable load service to the Portland Area. This project is identified as GERP 1.0.
- Estimated Cost: \$9,400,000
- Expected Energization: 2027

#### **Recently Completed Plans of Service**

There are no completed plans of service for this path since the last planning cycle.

## 10. Transmission Needs by Intertie

### 10.1 California-Oregon AC Intertie

#### Description

The California-Oregon intertie (COI), identified as Path 66 by WECC, is the alternating current (AC) Intertie between Oregon and California. It is a corridor of three parallel 500 kV alternating current power lines connecting to the grids in Oregon and California. The California – Oregon Intertie path has Accepted WECC Rating of 5,100 NW North to South and 3,675 MW Existing WECC Rating in South to North direction. The critical season for the COI occurs in the summer with high energy demands across the western interconnection and high flows to California due to generation surplus in the Northwest and Canada. In recent years, we have seen significant increase in South to North flows on COI, particularly during solar generation oversupply in California and Desert Southwest in spring and during Northwest peak loads in winter.

The path includes the following lines:

- Malin-Round Mountain 500 kV lines 1 and 2
- Captain Jack-Olinda 500 kV line 1

#### Proposed Plans of Service

##### Buckley Air Insulated Substation Addition

- Description: The Buckley 500 kV substation was a gas insulated substation and was experiencing component failures. These failures have caused prolonged outages of the entire substation resulting in severe transmission constraints that span over six months. The Buckley Gas Insulated Substation (GIS) ran out of the necessary spare parts to continue its operation. Currently, the GIS is bypassed by a temporary three terminal emergency bypass until a new conventional Air Insulated Substation (AIS) built. The Buckley GIS was configured in a ring bus and the replacement AIS will be configured in a double bus, double breaker layout using a breaker and half scheme that will provide opportunities for future system expansion.

- Purpose: This project is needed to maintain reliability in the area. This project is identified as GERP 1.0.
- Estimated Cost: \$150,000,000
- Expected Energization: 2030

#### **Recently Completed Plans of Service**

There are no recently completed plans of service for this intertie since the last planning cycle.

## **10.2 Pacific DC Intertie**

#### **PDCI Description**

The Pacific DC Intertie, identified as Path 65 by WECC, is the direct current Intertie between Oregon and California and consists of a 500 kV high voltage direct current (HVDC) lines from BPA's Celilo Converter Station in Oregon to the Los Angeles Department of Water and Power's (LADWP) Sylmar Converter Station in California. This transmission line transmits electricity from the Pacific Northwest to the Los Angeles area using high-voltage direct current. The Path 65 Pacific HVDC Intertie has Existing WECC Rating of 3,220 NW North to South and 3,100 MW Existing WECC Rating in South to North direction. The Intertie can transmit power in either direction, but power flows mostly from north to south. South-to-north transfers have been limited by AC network constraints in Los Angeles basin area. HVDC lines can help stabilize a power grid against cascading blackouts, since power flow through the line is controllable

The path includes the following lines:

- +/– 500 kV DC lines between Celilo and Sylmar

#### **Proposed Plans of Service**

No projects are proposed for this intertie.

#### **Recently Completed Plans of Service**

There are no projects that have been completed for this intertie since the previous planning cycle.

## **10.3 Northern Intertie (Canada to Northwest)**

## Description

The Northwest to British Columbia WECC Path 3, also known as the Northern Intertie (NI), is between the United States and Canada. Bonneville delivers power to Canada over the Northern Intertie, which includes lines and substations from Puget Sound north to the Canadian border. It has a western and an eastern component and is a bi-directional path that is dictated by import and export schedules from Canada. Puget Sound Area/Northern Intertie (PSANI) reinforcements were developed jointly between Seattle City Light, Puget Sound Energy and BPA in 2011 because of the Regional Puget Sound Area Study Team (PSAST).

The Northern Intertie includes the following lines:

### Western Component:

- Custer (BPA)-Ingledow (BCTC) 500 kV No. 1
- Custer (BPA)-Ingledow (BCTC) 500 kV No. 2

### Eastern Component:

- Boundary (BPA)-Waneta (TECK) 230 kV – normally open
- Boundary (BPA)-Nelway (BCTC) 230 kV

## Proposed Plans of Service

No projects are proposed for this intertie.

## Recently Completed Plans of Service

There are no projects that have been completed for this intertie since the previous planning cycle.

## 10.4 Montana to Northwest Intertie

### Montana to Northwest WECC Path 8 Description

This intertie is between Montana and the Northwest. It includes Northwestern Energy, Avista, and BPA lines. The highest flows on this path typically occur east to west during light load periods.

This path includes the following lines:

- BPA Kerr – BPA Kalispell 115 kV line
- BPA Broadview – BPA Garrison 500 kV line 1
- BPA Broadview – BPA Garrison 500 kV line 2
- BPA Mill Creek – BPA Anaconda 230 kV line
- BPA Placid Lake – BPA Hot Springs 230 kV line
- Northwestern Thompson Falls – Avista Burke 115 kV line
- Northwestern Crow Creek –Avista Burke 115 kV line
- Northwestern Rattlesnake 230/161 kV transformer
- Northwestern Mill Creek – Garrison 230 kV line
- Northwestern Ovando – Garrison 230 kV line

### Proposed Plans of Service

No projects are proposed for this intertie.

### Recently Completed Plans of Service

There are no completed plans of service for this intertie since the last planning cycle.

# 11. Transmission Planning Landscape

The future of transmission is being redefined. BPA supports a clean energy future and aims to continue bolstering the federal transmission system against extreme weather events, cybersecurity threats, and other high-impact challenges. Central to this effort is the integration of new energy sources, with an emphasis on enhancing grid reliability and seamlessly incorporating wind, solar, and hydropower resources.

BPA's Transmission initiatives are designed to improve reliability, reduce the incidence of grid disruptions, and expand renewable energy integration, contributing to a robust, adaptable, and economically supportive transmission system. Efforts involve aggressively identifying and developing transmission expansion projects to support customers' clean energy goals and planning substantial transmission expansion investments. These investments are pivotal in supporting a future-oriented, resilient, and high-performing grid that aligns with the region's priority of a clean energy future.

By leveraging strategic partnerships and investments in transmission infrastructure, BPA Transmission Services seeks to optimize grid performance and support the Pacific Northwest's economic growth, all while prioritizing sustainable practices and transparent stakeholder collaboration.

Below are noteworthy developments in transmission planning.

## 11.1 Regional Planning Efforts

### 11.1.1 WestTEC

The Western Transmission Expansion Coalition (WestTEC) is an industry-led planning effort established to evaluate and address interregional transmission needs across the Western Interconnection. Formed under the leadership of the Western Power Pool (WPP), WestTEC was launched in recognition of the growing need for coordinated, data-driven analysis of Western system transmission needs. The initiative brings together stakeholders from across the West, including utilities, regional planning bodies, state and tribal governments, public interest organizations, and infrastructure developers, supported by independent industry consultants, to collaboratively assess interregional transmission needs not adequately explored in other processes.

WestTEC deliverables include two major reports: (i) 10-Year Horizon Study focused on identifying near-term, actionable transmission upgrades needed by 2035, and (ii) a subsequent 20-Year Horizon Study that evaluates longer-term planning scenarios and corresponding transmission roadmaps through the year 2045. The 10-Year Horizon Study focuses on immediate transmission needs that lie ahead, while the 20-year Horizon Study will place greater emphasis on addressing planning uncertainties and quantifying the long-term value of a range of transmission portfolios.

WestTEC completed their 10-year studies in 2025 and continues working on 20-year studies. The 10-year study included System Reliability Assessment for heavy winter and summer peak loads, an Inter-Regional Deliverability Assessment scenario of heavy imports into the Pacific Northwest and high east-to-west transfers in the Western Interconnection, and a Congestion Assessment that identify economic inefficiencies associated with transmission constraints. BPA Transmission Planning has been participating in WestTEC inter-regional planning efforts by providing project models, reviewing base cases and scenarios, reviewing and commenting on the project report. BPA engagement has been a significant contributor to the success of WestTEC efforts.

WestTEC 10-year studies validate the critical importance of BPA GERP projects to ensure reliable power delivery under credible operating conditions. The report also highlights the high value of the inter-regional ties between the Pacific Northwest and the Desert Southwest, and the Pacific Northwest and Montana.

### 11.1.2 NorthernGrid

The intent of FERC Order No. 1000 is to improve the regional planning process and identify opportunities for any transmission developer, incumbent or non-incumbent, to coordinate and develop solutions that are both beneficial to the developer as well as the regional system to which that developer interconnects. Given the proper coordination and communication, only the necessary facilities would be identified, and those facilities would become the Regional Transmission Plan. NorthernGrid emphasizes The Regional Transmission Plan is not a construction plan – members have no obligation to build the facilities identified in the plan.

The NorthernGrid 2022-2023 Draft Final Regional Transmission Plan shows the regional combination of Boardman to Hemingway, Gateway West Phase 1, and Cascade Renewable Transmission Project received the highest contingency analysis ranking but a review of the violations identified that the eliminated violations only changed from slightly above to slightly below the criteria threshold. When considering this minimal improvement and the additional

project cost, the combination including Cascade Renewable Transmission Project was deemed less cost effective than the regional combination of Boardman to Hemingway and Gateway West Phase 1. A cost allocation analysis was not required because no Qualified Developers' projects were selected into the Regional Transmission Plan.

### **11.1.3 Western Resource Adequacy Program (WRAP)**

The Western Power Pool (WPP) filed at FERC the Western Resource Adequacy Program (WRAP) proposal, in Docket No. ER22-2762, which is intended to enhance resource adequacy. Resource adequacy ensures that there is enough energy capacity and reserves to maintain a balanced supply and demand across the electric system. The WRAP was approved by FERC in 2023. WRAP is not an organized market like CAISO's or SPP's Western Energy Imbalance Market but rather is a program that ensures that electricity supply in the West can meet the demand and reliability needs of customers. The WRAP is designed to be compatible with existing markets and programs in the West.

### **11.1.4 PNUCC Northwest Regional Forecast**

The Pacific Northwest Conference Committee (PNUCC) annually provides an assessment of the electric utility industry from a regional perspective. The forecast serves as a barometer for building increased awareness for how the picture is changing. In the 2024 Northwest Regional Forecast PNUCC anticipates a surge in demand for electricity in the Pacific Northwest over the next decade that surpasses previous projections. The forecast shows demand for electricity is projected to increase from about 24 average gigawatts (aGW) in 2024 to about 31 aGW in 2033, which is an increase in demand of over 30 percent. PNUCC attributes the increases to data center expansion, high-tech manufacturing growth, and the continuing trend toward electrification.

PNUCC members believe the region should work across the Western Interconnect to develop a coordinated approach to grid planning that will identify transmission upgrades and expansion to address the transmission constraints.

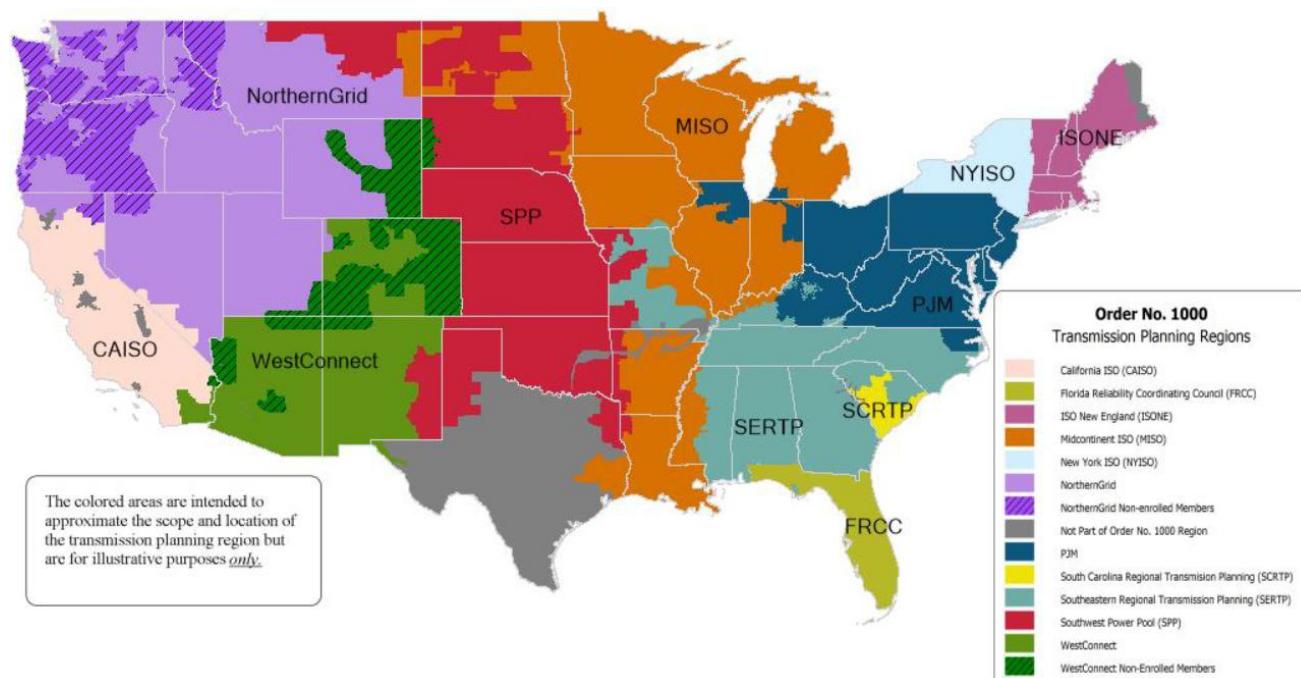
## **11.2 Regulatory**

### **11.2.1 FERC Order 1920**

On May 13, 2024, FERC issued a final rule to improve regional electric transmission planning and cost allocation. The final rule adopts various requirements concerning how transmission

providers conduct long-term regional planning and allocate the costs of transmission facilities planned through those processes. Order No. 1920 builds upon Order No. 888, Order No. 890, and Order No. 1000 and modifies FERC regulations under Section 206 of the Federal Power Act to ensure that rates, terms and conditions for transmission service remain just and reasonable.

Order No. 1920 applies to all transmission providers (i.e., public utilities that own, control, or operate transmission facilities) that have an Open Access Transmission Tariff on file with FERC. A Regional Transmission Organization (RTO)/ Independent System Operator(ISO) transmission planning region will submit a compliance filing on behalf of transmission providers within their footprint. Transmission providers in non-RTO/ISO transmission planning regions will submit individual compliance filings.



Source: [www.ferc.gov](http://www.ferc.gov)

### 11.2.2 FERC NOPR Interconnection Reform

#### FERC NOPR

In 2022, Federal Energy Regulatory Commission (FERC) issued a proposed rule focused on expediting the current process for connecting new electric generation facilities to the grid. The notice of proposed rulemaking (NOPR) Docket No. RM22-14 aims to address significant current backlogs in the interconnection queues. The NOPR reforms have three broad goals: implement a first-ready, first-served cluster study process; increase the speed of interconnection queue

processing; and incorporate technological advancements into the interconnection process. Comments were due October 13<sup>th</sup>, 2022 and reply comments were due November 14, 2022. BPA provided comments in the docket. This Interconnection Reform NOPR builds on Commission Order Nos. 2003 and 2006 where it first required public utility transmission providers to adopt its standard procedures and agreements for interconnecting large and small generating facilities, and Order No. 845 that revised those procedures and agreements. The electricity sector has transformed significantly since the issuance of Order Nos. 2003 and 2006. The growth of new resources seeking to interconnect to the transmission system and the differing characteristics of those resources have created new challenges for the generator interconnection process. These new challenges are creating large interconnection queue backlogs and uncertainty regarding the cost and timing of interconnecting to the transmission system.

### **FERC Final Order**

In 2023 FERC issued its final rule in Docket No. RM22-14-000 Order No. 2023 Improvements to Generator Interconnection Procedures and Agreements. The final rule requires all public utility transmission providers to adopt revised *pro forma* Large Generation Interconnection Procedures (LGIP), *pro forma* Large Generator Interconnection Agreements (LGIA), *pro forma* Small Generator Interconnection Procedures (SGIP), and *pro forma* Small Generator Interconnection Agreements (SGIA). The reforms to the Commission's *pro forma* LGIP and LGIA implement a first-ready, first-served cluster study process; increase the speed of interconnection queue processing; and incorporate technological advancements into the interconnection process.

### **BPA Response**

In 2023, BPA engaged customers and stakeholders through a series of workshops to discuss potential reforms to its tariff to develop and implement a regional solution to improve BPA's Standard Large Generator Interconnection Procedures. As a result, BPA conducted a TC-25 Terms and Conditions Tariff Proceeding to adopt reforms to BPA's LGIP. BPA's TC-25 Settlement Proceedings provide a draft Attachment L and Attachment R to the Open Access Transmission Tariff. The proposed document is for settlement purposes only. Attachment L is for Standard Large Generator Interconnection Procedures including Standard Large Generator Interconnection Agreement. Attachment R is for the Large Generator Interconnection Transition Process. The Transition Request Window shall open the date of the issuance of the Administrator's Final Decision of Record (ROD) in the TC-25 Tariff Proceeding and close 90 days calendar days after the issuance of the ROD in the TC-25 Tariff proceeding. The proposed effective date for the tariff is the date the ROD is issued.

### **11.2.3 New NERC TPL-008 Reliability Standard**

FERC approved NERC TPL-008-1 Reliability Standard on Transmission System Planning Performance Requirements for Extreme Temperature Events in 2025.

TPL-008-1 Reliability Standard will require Planning Coordinators to:

- Develop of benchmark planning cases based on major prior extreme heat and cold weather events and/or meteorological projections.
- Perform extreme temperature assessment using steady-state and transient stability analyses
- Develop Corrective Action Plans that mitigate instances where performance requirements are not met for extreme heat and cold weather events.

TPL-008-1 Reliability Standard has 5-year implementation timelines with milestones along the way.

## 11.3 State Legislation

### Clean Energy Timeline

	2025	2030	2035	2040	2045
<b>Oregon</b>		Investor-owned utilities 80% below baseline emissions levels.	Investor-owned utilities 90% below baseline emissions levels.	Investor-owned utilities 100% below baseline emissions levels.	
<b>Washington</b>	Electric utilities eliminate coal fired generation	Electric utilities must be greenhouse gas neutral			Electric utilities must generate 100% power from renewable or zero-carbon resources
<b>California</b>			90% clean energy	95% clean energy	100% clean energy

### 11.3.1 State's Clean Energy Bills

#### Oregon Clean Energy House Bill 2021

Electric companies are required to develop clean energy plans and electricity service suppliers to report information for meeting clean energy targets. This bill requires retail electricity providers to reduce greenhouse gas emissions associated with electricity sold to Oregon consumers.

- **2030** – Reduce greenhouse gas emissions to 80 percent below baseline emissions levels.
- **2035** – Reduce greenhouse gas emissions to 90 percent below baseline emissions.
- **2040** – Reduce greenhouse gas emissions to 100 percent below baseline emissions levels.

### **Washington's Clean Energy Transformation Act (CETA)**

In 2019 the Washington State Legislature passed a set of bills creating an ambitious, multi-decade agenda that changes how electric and natural gas utilities acquire resources and provides energy services to Washington business and consumers. CETA requires the state's electric utilities to fully transition to clean, renewable, and non-emitting resources by 2045. Washington's investor-owned utilities must develop and implement plans. The law provides safeguards to maintain affordable rates and reliable service. It also requires an equitable distribution of the benefits from the transition to clean energy for all utility customers and adds and expands energy assistance programs for low-income customers.

The act sets the following mandatory targets:

- **2025** – All electric utilities must eliminate coal-fired generation serving Washington state customers.
- **2030** – All electric utilities must be greenhouse gas neutral
- **2045** – All electric utilities must generate 100% of their power from renewable or zero-carbon resources.

### **California's Clean Energy Bill**

As California faces severe drought conditions and risk of wildfires, California lawmakers passed legislation that codifies new benchmarks to get California to 90 percent clean electricity by 2035 and 95 percent by 2040, which is a stepping stone toward its already established goal of 100 percent clean electricity by 2045. The \$54 billion is to be spent over five years on electric vehicles, public transit, climate, and drought resistance programs, and to decarbonize the state's electrical grid. The closure of California's Diablo Canyon nuclear plant is postponed helping stabilize the state's grid as the plant provides an estimated 6-9 percent of the state's electricity and was set to close in 2025. Previous laws called for the use of 60 percent renewable energy by 2030.

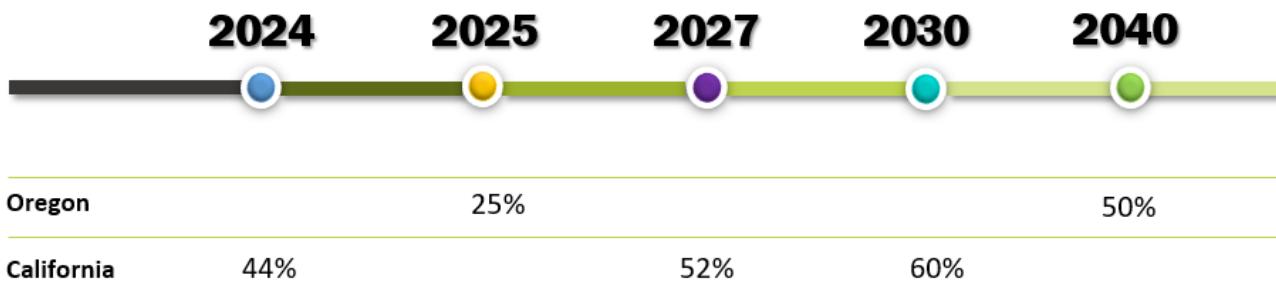
- **2035** – 90 percent clean electricity
- **2040** – 95 percent clean electricity

- 2045 – 100 percent clean electricity

### 11.3.2 State's Renewable Portfolio Standards

#### State Renewable Portfolio Standards Timeline

States created the renewable standards to diversify their energy resources.  
Standards are typically measured by the percentage of retail electric sales.



A Renewable Portfolio Standard (RPS) is a regulatory mandate to increase production of energy from renewable sources such as wind, solar, biomass and other alternatives to fossil and nuclear electric generation. States created these standards to diversify their energy resources, promote domestic energy production and reduce emissions. This RPS mechanism places an obligation on regulated utilities to produce a specified fraction of electricity from renewable energy sources. Standards are typically measured by the percentage of retail electric sales. Below are general requirements by select states.

- California's requirement is 44 percent by 2024, 52 percent by 2027, and 60 percent by 2030 for investor-owned and municipal utilities. Finally requiring 100 percent clean energy by 2045.
- Washington's requirement is 15 percent by 2020 for investor-owned utilities and retail suppliers. The Clean Energy Act of 2019, a new clean energy electricity standard, requires utilities eliminate coal-fired generation by 2025, be greenhouse gas neutral by 2030, and generate 100 percent of power from renewable or zero-carbon resources by 2045.
- Oregon's requirement is 25 percent by 2025 and 50 percent by 2040 for utilities with 3 percent or more of the state's load; 10 percent by 2025 for utilities with 1.5-3 percent of the state's load; and 5 percent by 2025 for utilities with less than 1.5 percent of the state's load.
- Montana's requirement is 15 percent by 2015.
- Idaho and Wyoming have no standard.

## 12. Supplemental Information

### 12.1 List of Projects by Planning Area

Area	Project Title	Project Number	Expected Energization Date	Estimated Cost
<b>1. Northwest Washington Planning Area (NWWA)</b>				
<b>Chehalis – Centralia Load Area</b>				
	Silver Creek Substation Reinforcements (RN)	P01092	2028	\$11,300,000
<b>Olympic Peninsula Load Area</b>				
	Kitsap 115 kV Shunt Capacitor Modification	P01443	2029	\$4,000,000
	Shelton – Fairmont #1 115 kV line rebuild	P00695	2029	TBD
<b>Seattle – Tacoma – Olympia Load Area</b>				
	Raver 500/230 kV Transformer (PSANI) (RN)	P00094	2024	Completed
	Maple Valley 230 kV Shunt Reactor	P06244	2028	\$7,800,000
	Monroe-Novelty 230 kV Line Upgrade	P02367	2028	\$2,500,000
	Sno-King 230/115 kV Bank #3 Power Circuit Breaker Bushing CTs		TBD	TBD
	Covington 500/230 kV banks 4 and 5 upgrade	P04132	2027	TBD
	Snohomish 230/115 kV Banks Replacement		2027	TBD
<b>Southwest Washington Coast Load Area</b>				
	Aberdeen-Aberdeen Tap to Satsop Park – Cosmopolis 115 kV Line Upgrade	P03506	2028	\$1,172,000
	Cosmopolis-Satsop Park 115 kV No.1 Upgrade project	P05918	Completed	
	South Elma – Satsop Park No. 1 Line – Remove Impairments	P05918	Completed	
	Naselle Shunt Capacitor Replacement		2028	TBD
	South Elma 115 kV Substation Addition		TBD	TBD
<b>2. Willamette Valley Southwest Washington Planning (WILSWA)</b>				
<b>North Oregon Coast Load Area</b>				
	High-Side Breaker and Switchgear Associated with the Clatsop Transformer Replacement	P05435	2027	\$1,600,000

Clatsop 230/115 kV Transformer Upgrade		TBD	TBD
Astoria-Driscoll 115-kV transmission line Rebuild	P04157	Completed	
<b>Portland Load Area</b>			
Forest Grove – McMinnville 115 kV Line Upgrade	P03469	2026	\$1,800,000
Carlton Upgrades ( <b>RN</b> )	P01367	2026	\$19,000,000
Troutdale 230 KV Series Bus Sectionalizing Breaker	P04401	2027	\$3,490,000
St. Johns 230/115 kV Low-Side Line Section (Remove Impairments)	P03619	Completed	
Keeler 230 kV Bus Sectionalizing Breaker Addition L0452 <b>(GERP1)</b>	P04632	2029	\$11,530,000
	P04974	2026-2028	\$9,400,000
<b>3. Southwest Oregon Planning Area (SWOR)</b>			
<b>Eugene Load Area</b>			
Lookout Point – Alvey No. 1 and 2 Transfer Trip Addition	P03258	2026	\$3,000,000
Alvey-Dillard Tap 115 KV Line Rebuild	P04286	2028	\$1,300,000
<b>Salem/Albany Area</b>			
Chemawa 230/115 kV Transformer Upgrade		TBD	TBD
Santiam 500/230 kV Bank #4		TBD	TBD
Lebanon 230/115 kV Transformer Addition		TBD	TBD
<b>South Oregon Coast Load Area</b>			
Central Oregon Coast O&M Flex ( <b>RN</b> ) (Toledo, Wendson, Santiam, Tahkenitch)	P02230	Completed	
<b>4. Northern Planning Area</b>			
<b>Mid-Columbia Load Area</b>			

Columbia 230 kV Bus Tie and Sectionalizing Breaker Addition and Northern Mid-Columbia Area Reinforcement (Joint Utility) & Northern Mid-Columbia Area Reinforcement ( <b>RN</b> )	P00076	Completed	
Columbia 115 KV Breaker(B-400) Free Standing Current Transformer (C05409) Upgrade		TBD	TBD
Valhalla B-288 Bushing Current Transformer (BCT) #2 Upgrade		TBD	TBD
Ellensburg 115 kV Shunt Capacitor Expansion		TBD	TBD
Grand Coulee 230 kV Fault reduction Project		2027	
<b>Okanogan Load Area</b>			
East Omak 115kV Shunt Capacitor Addition		TBD	TBD
<b>5. Central Planning Area</b>			
<b>Tri-Cities Load Area</b>			
McNary-Patterson Tap 115 kV Line ( <b>RN</b> )	P02364	Completed	
Red-Mountain – Horn Rapids 115 kV Line Reconductor	P03102	Completed	
Richland-Stevens Drive 115 kV Line ( <b>RN</b> )	P02365	2027	\$12,600,000
G0558 South Tri-Cities Reinforcement Webber Canyon ( <b>RN</b> )	P04691	2027	\$105,800,000
Sacajawea to Ice Harbor-Franklin #1		TBD	TBD
<b>Umatilla – Boardman Load Area</b>			
Longhorn 500/230 kV Substation L0482	P04342	Completed	
McNary 230 kV Bay Addition L0481	P04246	Completed	
Morrow Flat 230 KV Shunt Reactor	P04423	Cancelled	
Six Mile Canyon 500/230 kV Substation Addition (West of Boardman) L0510 ( <b>GERP1</b> )	P05580	2028	\$284,000,000
<b>Walla Walla Load Area</b>			
Tucannon River 115 KV 15 MVAR Shunt Reactor ( <b>RN</b> )	P04438	Completed	
<b>6. Southern Planning Area</b>			
<b>Central Oregon Load Area</b>			
La Pine 115 Substation Upgrade TSEP 2016	P03443	2026	\$7,100,000

La Pine Upgrade Transformer Addition TSEP 2016	P05322	2027	\$11,600,000
New Bonanza 500/230 kV Substation addition ( <b>GERP2</b> )		2030	TBD
Bonanza-La Pine 230 kV line addition ( <b>GERP2</b> )		2030	TBD
<b>Northern California Area</b>			
Warner 115 kV +/- 100 MVAR STATCOM addition ( <b>GERP2</b> )		2030	TBD
<b>California to Oregon AC Intertie</b>			
Buckley Air Insulated Substation ( <b>GERP1</b> )	P03999	2030	\$150,000,000
<b>7. Eastern Planning Area</b>			
<b>North Idaho Load Area</b>			
Libby Power House 1 AND 2 Redundant Transfer Trip	P04231	2026	\$800,000
Troy Substation Expansion and Breaker Addition	P02299	2032	\$10,000,000
Troy 115 kV Shunt Capacitor Addition		2032	TBD
<b>Northwest Montana Load Area</b>			
Conkelley Substation Retirement ( <b>RN</b> )	P02259	2027	\$32,000,000
Columbia Falls 115/34.5 kV Transformer Replacement	P06349	TBD	\$8,500,000
Columbia Falls 230/115 kV Transformer Bank 2 and 3 Replacements		TBD	TBD
<b>Spokane – Colville – Boundary Load Area</b>			
Bell-Boundary 230 kV No. 1 (Sacheen) Line Upgrade	P05566	Completed	
<b>8. Idaho Planning Area</b>			
<b>Southeast Idaho – Northwest Wyoming Load Area</b>			
Spar Canyon 230 kV Reactor Addition	P02306	Completed	
Rebuild Cattle Creek-Palisades and Palisades- Swan Valley 115 kV lines to 161 kV with additions of 161/115 kV transformers at Palisades and Swan Valley		TBD	TBD
Build a new 115 kV Targhee substation and remove 115 kV Targhee Tap, add an additional 16.5 MVAR shunt capacitor at Targhee, and reconductor the Targhee-Swan Valley and Targhee-Drummond 115 kV lines		TBD	TBD
At Teton 115 kV substation add a sectionalizing breaker and a new 12.6 MVAR shunt capacitor		TBD	TBD
<b>Southeast Idaho – Northwest Wyoming Load Area</b>			

Heyburn- West Burley 138 kV line upgrade Line Upgrade		TBD	TBD
<b>9. Lower Columbia Planning Area</b>			
<b>Hood River –The Dalles Load Area</b>			
Quenett Creek Substation Addition L0380 ( <b>RN</b> )	P02256	2028	\$57,500,000
Big Eddy 230 KV Bus Differential Relay Addition		TBD	TBD
NWCPUD's Bigg Eddy- The Dalles 115 kV upgrade		TBD	TBD

Note: In the table above, GERP 1.0 projects are identified as (GERP1) after the project title and Regional Need projects as (RN).

GERP projects not listed in the table above include the following:

GERP 1.0

- Chehalis-Covington Line Upgrade to Cowlitz Tap, TSEP 2022, 2028
- New Bonanza Substation, L0543, 2028
- Ross-Rivergate 230 kV Line Upgrade, TSEP 2022, 2030
- New La Pine-Bonanza 230 kV Line, 2030
- Rock Creek – John Day 500 kV Line Upgrade, TSEP 2022, 2030
- Big Eddy-Chemawa-1 500 kV Line Rebuild, TSEP 2022, 2032

## 12.2 List of Projects by Path

Path No.	Project Title	Bundle Number	Expected Energization Date	Estimated Cost
1	<b>North of Hanford</b>			
2	<b>West of McNary</b>			
3	<b>West of Slatt</b>			
4	<b>West of John Day</b>			
5	<b>Raver to Paul</b>			
6	<b>South of Allston</b>			
	Keeler 500 kV Expansion and Transformer Addition ( <b>GERP1</b> )	P05449	2029	\$36,000,000
7	<b>West of Cascades South</b>			
8	<b>North of Echo Lake</b>			
9	<b>South of Custer</b>			
10	<b>West of Cascades North</b>			
	Schultz-Raver Reconductor and Paul Capacitor ( <b>GERP1</b> )	P5470	2030	\$150,000,000
	Schultz-Raver Series Capacitors ( <b>GERP1</b> )	P04364	2030	\$50,300,000
11	<b>West of Hatwai</b>			
12	<b>West of Lower Monumental</b>			
13	<b>North of Pearl</b> Pearl-Sherwood-McLoughlin Upgrade TSEP 2021		2027	\$9,400,000

14	North of Grizzly			
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## 12.3 List of Projects by Intertie

Intertie No.	Project Title	Bundle No.	Expected Energization Date	Estimated Cost
1	<b>California to Oregon AC Intertie</b>			
	Buckley Air Insulated Substation ( <b>GERP1</b> )	P03999	2030	\$150,000,000
2	<b>Pacific DC Intertie</b>			
3	<b>Northern Intertie</b>			
4	<b>Montana to Northwest</b>			

## 12.4 2025 System Assessment Forecast Peak Load Level

2025 System Assessment Area Peak Loads					
No.	Load Areas	2025 Assessment (5yr) Near Term		2025 Assessment (10yr) Long Term	
		2030 Peak Load Forecast (MW)		2034 Peak Load Forecast (MW)	
		Summer	Winter	Summer	Winter
1	Seattle / Tacoma / Olympia	7794	9678	8093	9701
2	Portland	5862	5457	6825	6137
3	Vancouver	872	1000	1042	1133
4	Salem / Albany	1077	983	1235	1120
5	Eugene	720	916	742	945
6	Olympic Peninsula	812	1330	847	1354
7	Tri-Cities	1525	1065	1558	1100
8	Longview	598	732	599	733
9	Mid-Columbia	3796	4152	3883	4450
10	Central Oregon	1030	1183	1258	1408
11	SW Washington Coast	192	384	192	385
12	Spokane / Colville / Boundary	877	954	992	1164
13	Centralia / Chehalis	178	267	178	267
14	NW Montana	365	485	386	513
15	SE Idaho / NW Wyoming	212	383	226	412
16	North Idaho	126	197	129	214
17	North Oregon Coast	179	289	197	284
18	South Oregon Coast	291	490	306	494
19	De Moss / Fossil	23	31	23	32
20	Okanogan	183	248	188	254
21	Hood River / The Dalles	432	445	525	535
22	Pendleton / La Grande	143	133	143	134
23	Walla Walla	133	117	137	121
24	Burley	250	200	267	215
25	Northern California	143	94	152	94
26	Klickitat	59	77	61	80
27	Umatilla / Boardman	2873	2816	3399	3399
	All Areas	30745	34106	33583	36678

## 14.5 List of Acronyms

Acronym	Title

Alder	Alder Mutual Light Company
AC	Alternating Current
ARM	Alternative Review Meeting
ATC	Available Transfer Capability
AVA	Avista Corp
BCTC	British Columbia Transmission Corporation
BPA	Bonneville Power Administration
BPUD	Benton Public Utility District
BREA	Benton Rural Electric Association
CS	Cluster Study
CAA	Clean Air Act
CAISO	California Independent System Operator
CBF	City of Bonners Ferry
CCCT	Combined-Cycle Combustion Turbine
CEC	Central Electric Coop
Chelan	Chelan County Public Utility District
CIFP	Commercial Infrastructure Financing Proposal
CIP	Capital Investment Portfolio
Clark	Clark Public Utilities
COE	City of Eatonville
COI	California Oregon Intertie
COS	City of Steilacoom
CPP	Clean Power Plan
Cowlitz	Cowlitz Public Utility District
DOE	Department of Energy
Douglas	Douglas County Public Utility District
EIM	Energy Imbalance Market
EL&P	Elmhurst Light and Power
Emerald	Emerald Public Utility District
EPA	Energy Protection Agency
ETC	Existing Transfer Commitments
EWEB	Eugene Water and Electric Board
FAS	Interconnection Facilities Study
FCRPS	Federal Columbia River Power System

FCRTS	Federal Columbia River Transmission System
FEC	Flathead Electric Cooperative
FERC	Federal Energy Regulatory Commission
FES	Interconnection Feasibility Study
GI	Generator Interconnection
HVDC	High Voltage Direct Current
IPC	Idaho Power Company
ISIS	Interconnection System Impact Study
LADWP	Los Angeles Department of Water and Power
LGI	Large Generator Interconnection
LGIA	Large Generator Interconnection Agreement
LGIP	Large Generator Interconnection Procedure
LL&P	Lakeview Light and Power
LLI	Line and/or Load Interconnection
LT ACT	Long-Term Available Transfer Capability
LTF	Long-term Firm
LVE	Lower Valley Energy
M2W	Montana to Washington
MEC	Midstate Electric Cooperative
Milton	City of Milton
MT-NW	Montana-Northwest
MVAR	Mega Volt-Amphere reactive
NEPA	National Environmental Policy Act
NERC	North America Electric Reliability Corporation
NWE	Northwestern Energy
NITS or NT	Network Integration Transmission Service
NI-W	Northern Intertie West
NLI	Northern Lights, Inc.
NOEL	North of Echo Lake
NOS	Network Open Season
NPCC	Northwest Power and Conservation Council
NW-CA	Northwest to California
OATT	Open Access Transmission Tariff
OML	Ohop Mutual Light

PA	Paul-Allston
PAC	PaciFiCorp
PC	Planning Coordinator
PCM	Project Coordination Meeting
PDI	Project Delivery Information
PDCI	Pacific Direct Current Intertie
PDT	Project Definition Team
PEFA	Planning and Expansion Functional Agreement
PGE	Portland General Electric
PI	Peninsula Light
PL&P	Parkland Light and Power
PMU	Phasor Measurement Unit
PNW	Pacific Northwest
PNUCC	Pacific Northwest Utilities Conference Committee
POD	Point of Delivery
POR	Point of Receipt
POS	Plan of Service
PPOS	Proposed Plan of Service
PRD	Project Requirement Diagram
PSA	Puget Sound Area
PSE	Puget Sound Energy
PSM	Project Strategy Meeting
PTC	Production Tax Credit
PTP	Point-to-Point
PTDF	Power Flow Distribution Factor
RAS	Remedial Action Scheme
RP	Raver-Paul
RRO	Regional Reliability Organization
SCL	Seattle City Light
7 <sup>th</sup> Plan	Northwest Power and Planning Council's Seventh Power Plan
SIS	System Impact Study
SMI	Small Generator Interconnection
SOA	South of Allston
SOB	South of Boundary

SGIP	Small Generator Interconnection Process
SPUD	Snohomish County Public Utility District
SVEC	Surprise Valley Electrification Corporation
TI	Technology Innovation
TIP	Technology Innovation Project
TLS	Transmission Load Service
TP	Transmission Planners
TPL	Transmission Planning Standard
T-Plan	Transmission Plan
TPU	Tacoma Power Utilities
TS	Transmission Service
TSEP	Transmission Service Requests and Expansion Process
TSR	Transmission Service Request
TTC	Total Transfer Capability
UEC	Umatilla Electric Co-op
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
WEC	Wasco Electric Cooperative
WECC	Western Electricity Coordinating Council
WOCN	West of Cascades North
WOCS	West of Cascades South
WOH	West of Hatwai
WOJ	West of John Day
WOLM	West of Lower Monumental
WOM	West of McNary
WOS	West of Slatt
WPUD	Whatcom Public Utility District