

## Ten-year Plan

As a result of the analysis completed for the 2009 System Assessment, the follow-up sensitivity studies, analysis completed by the study teams, and individual planning participant studies, the following facilities are considered to be committed projects that are being built or are in the project design and siting processes. These projects comprise the ColumbiaGrid Ten-year Transmission Plan. This plan will be coordinated with other subregions (e.g., Northern Tier Transmission Group) and with the overall region through the Western Electricity Coordination Council. During 2010 and 2011, the WECC will be developing an overall plan for the western interconnection. The ColumbiaGrid ten-year plan will be part of the foundation for the overall WECC plan.

Figure 1 and Table 1

Each of the facilities shown in the plan is described in greater depth in the last appendix of this report.

Most of these plans are expected to be implemented in the five-year planning horizon. There are several other planning needs that have been identified in the five to ten year planning horizon and they are identified below. These transmission needs do not have firm projects at this time since there is sufficient time to study these areas and develop projects to resolve those needs. As the projects mature and become committed plans, they will be incorporated into the ColumbiaGrid Ten-year Plan.

Long term needs in the ColumbiaGrid Planning area

### 1. West of Cascades North and South

Several projects have been identified to reinforce these two paths to meet load growth and transfer eastside resources to the west side load areas. These projects include:

- a. Puget Sound Energy IP line – Puget Sound Energy is planning to upgrade its line between Kittitas and Lake Tradition Substations to increase cross cascades north capacity.
- b. Series capacitors at Schultz - Bonneville is looking at additional series capacitors on the Schultz-Raver #3 and #4 500 kV lines to increase cross cascades north capacity.
- c. A new cross cascades 500 kV line into the Puget Sound area - If the smaller reinforcements listed above are insufficient, an additional 500 kV line may be needed across the northern cascades.
- d. Station K - Additional capacity on the west of cascades south path could be obtained by the development of a new substation Maupin area in central Oregon and the addition of series capacitors.
- e. Portland General Electric's Cascade Crossing Project – This project includes a Boardman-Juniper Flats-Bethell 500 kV line into the Salem area.

### 2. Colstrip Upgrades

Series capacitor additions and other additions are being considered to upgrade the Montana to Northwest path.

3. Puget Sound Area Reinforcements

Several projects are being considered in the North Puget Sound area to reduce PSANI curtailments. Some of these projects include:

a. North King County Capacity Increase

A 230 kV line between Sammamish substation in north King County and Talbot Substation in central King County is planned to support growing loads in that area and to increase the capacity of the Monroe-Echo Lake cutplane.

4. Pearl-Sherwood Upgrades

Bonneville and Portland General Electric are planning to separate the terminations for the existing Pearl-Sherwood 230 kV lines to provide additional capacity during outages to meet load growth in the southwest Portland area.

5. Shelton-Fairmount-Port Angeles support

A new 60 mile 230 kV line from Shelton to Fairmount is envisioned by Bonneville to support the Port Angeles/Port Townsend area of the Olympic Peninsula to meet growing loads.

6. North Downtown Seattle

Seattle City Light is planning a new substation in the area north of downtown Seattle to serve load growth. This project would involve the installation of underground 230kV transmission lines from East Pine and Massachusetts Substations to a new Substation with a 230kV/115 kV autotransformer. The project construction would also include new 115kV transmission lines from Canal and Broad Street Substations to New Substation. This project was studied last year and approved by the ColumbiaGrid Board but load growth in the area has subsided and the project was delayed.

7. Lakeside 230/115 kV transformer

Puget Sound Energy is planning a 230/115 kV transformer at Lakeside Substation in the Bellevue Washington area. If a Lakeside transformer is added in place of the Lake Tradition bank, a Lake Tradition transformer will be needed in the longer planning horizon.

8. Mid Columbia Area Reinforcement Phase 2

Grant County PUD is contemplating additional reinforcement between Wanapum and Midway 230 kV substations in central Washington.

9. Spokane Area 230 kV Reinforcement

Additional transformation is envisioned by Avista at Sunset Substation with new 230 kV lines to Westside, Beacon and/or Boulder substations in south Spokane to meet growing loads.

10. Moscow Transformer Additions

An increase of transformer capacity in the Moscow, Idaho area is needed to meet growing Avista loads.

11. Lewiston Reinforcements

A second Lolo-Hatwai 230 kV line is one solution to increase capacity for Avista load growth and operational flexibility.

12. Walla Walla-Wallula 230 kV line

This project may be needed by PacifiCorp in the future for transmission service requests for wind generation.

13. Springerville-Horizon 230 kV line

A new 230 kV line from the Trojan-St. Mary's line is planned by Portland General Electric to meet growing loads in the west Portland area.

14. Chemawa 230/115 transformer additions

Additional transformation is envisioned in the north Salem area to meet growing Bonneville loads.

15. Blue Lake-Gresham 230 kV line

Portland General Electric is planning this project, or an alternative, to provide support for load growth in the east Portland area.

16. Kalama Energy

A new 230 kV line from Kalama to Longview is being studied by Cowlitz PUD to connect a 680 MW gas turbine to the system and provide for load growth in the area.

17. Trojan-Horizon 230 kV line

This new line would provide additional capacity on the South of Allston path and help move Beaver and Port Westward generation to Portland General Electric loads in the west Portland area.

18. Pilot Butte area transformation

A 500/230 kV transformer addition is being investigated by Bonneville in the Ponderosa/Pilot Butte area to meet growing loads in the Bend/Redmond area in central Oregon.

19. Additional 500/230 kV transformation in South Puget Sound area

Limitations in 500/230 KV transformation in the south Puget Sound Area will require additional transformation, possibly at Maple Valley, Covington, Tacoma or Olympia. Depending upon the location selected, additional transmission lines may also be required.

<b>Project Name</b>	<b>Sponsor</b>	<b>Date</b>
Olympic Peninsula Reinforcement (Satsop-Shelton 230 kV line)	Bonneville Power	2009
Libby - Troy 115 kV line rebuild	Bonneville Power	2009
Rogue SVC (South Oregon Coast)	Bonneville Power	2009
Mid Columbia Area Reinforcement (Vantage - Midway 230 kV line upgrade)	Bonneville Power	2011
Second 230/115 kV transformer at Redmond	Bonneville Power	2011
Sandpiper Substation connecting into the existing Ashe - Marion 500 kV line and the new McNary - John Day 500 kV line	Bonneville Power	2012
Bakeoven Series Capacitors plus other shunt caps and line upgrades (COI Upgrade)	Bonneville Power	2012
John Day - McNary 500 kV Line	Bonneville Power	2013
Big Eddy - Knight (formerly Station Z) 500 kV line looping into the new Knight Substation on the existing Wautoma - Ostrander 500 kV line	Bonneville Power	2013
Central Ferry - Lower Monumental 500 kV line and connection to existing Lower Granite - Lower Monumental 500 kV lines at the new Central Ferry Substation	Bonneville Power	2013
Castle Rock - Troutdale 500 kV line (I-5 Corridor Reinforcement Project) connected to the Paul-Allston line at the new Castle Rock Substation	Bonneville Power	2015
Lower Valley Reinforcement (SE Idaho)	Bonneville Power/others	2010
<b>Retermination of lines into Andrew York Substation</b>	<b>Chelan</b>	<b>2010</b>
<b>Relocation/upgrade of the McKenzie - Wenatchee Tap 115 kV line</b>	<b>Chelan</b>	<b>2012</b>
<b>Wenatchee-McKenzie 115 kV line uprate from 50 - 75 degree C</b>	<b>Chelan</b>	<b>2011</b>
<b>Cowlitz PUD conversion from 69 kV to 115 kV (Longview - Cowlitz #2, Longview - Lexington #2, Longview - Lexington - Cardwell)</b>	<b>Cowlitz PUD</b>	<b>2011-2014</b>
<b>Rapids - South Nile 115 kV line</b>	<b>Douglas</b>	<b>2010</b>
<b>Douglas - Rapids 230 kV line and Rapids 230/115 kV substation</b>	<b>Douglas</b>	<b>2013</b>
<b>Columbia - Larson 230 kV line</b>	<b>Grant</b>	<b>2014</b>
<b>Hemingway - Boardman 500 kV line</b>	<b>Idaho Power</b>	<b>2015</b>
<b>Vantage - Pomona Heights 230 kV line (Yakima area)</b>	<b>PacifiCorp</b>	<b>2012</b>

<b>New Lookingglass Substation on the Reston - Dixonville 230 kV line (Albany area)</b>	<b>PacifiCorp</b>	<b>&lt;2013</b>
<b>Parish Gap 230/115 kV substation connecting to Bethel - Fry 230 kV line (Albany area)</b>	<b>PacifiCorp</b>	<b>2012</b>
<b>Wallula-McNary 230kV line</b>	<b>PacifiCorp</b>	<b>2012</b>
<b>White City 230/115 kV transformer addition (Medford)</b>	<b>PacifiCorp</b>	<b>2012</b>
<b>Keeler - Horizon 230 kV line with 230/115 kV transformers at Horizon</b>	<b>Portland General Electric</b>	<b>2012</b>
<b>South of Sedro Capacity Increase (Sedro - Horse Ranch 230 kV line)</b>	<b>Puget Sound Energy</b>	<b>2010</b>
<b>230/115 kV transformer at Alderton Substation in south Puget Sound area</b>	<b>Puget Sound Energy</b>	<b>2011</b>
<b>Thurston County Transformer Capacity (St. Claire Substation )</b>	<b>Puget Sound Energy</b>	<b>2012</b>
<b>Lake Tradition 230/115 kV transformer fed via Maple Valley - Sammamish 230 kV line</b>	<b>Puget Sound Energy</b>	<b>2012</b>
<b>230/115 kV transformer addition at Sedro Woolley Substation (#2) in north Puget Sound area</b>	<b>Puget Sound Energy</b>	<b>2013</b>
<b>Beverly Park 230-115kV transformer (North Puget Sound)</b>	<b>Snohomish PUD</b>	<b>2012</b>
<b>Cowlitz 230 kV transformer replacement (second bank, Tacoma)</b>	<b>Tacoma Power</b>	<b>2011</b>
<b>Canyon Substation (Tacoma area)</b>	<b>Tacoma Power</b>	<b>2011</b>
<b>Rapids - Columbia 230 kV line (Mid-Columbia area)</b>	<b>undetermined</b>	<b>2013</b>