

## Puget Sound Energy, Inc. Resource Integration Capability Overview

### **Document Intent:**

This document is intended to provide a high level overview of local and regional constraints impacting potential generation resource additions on the Puget Sound Energy, Inc. (PSE) transmission system. This overview assumes that every generating project will require some direct cost improvements to interconnect to the system. Site specific impacts and costs will be determined in connection with individual OASIS requests for transmission and generation interconnection.

In the Puget Sound region there are multiple transmission owners including the Bonneville Power Administration (BPA), Seattle City Light (SCL), Tacoma Power and Snohomish County PUD. Transmission constraints may be due to limitations on these neighboring systems. Resolving transmission constraints often will involve collaboration with neighboring transmission owners (also known as Affected Systems) and in some cases will require upgrades on their systems

### **Local System Constraints:**

With the exception of Kitsap and Jefferson Counties, the backbone of PSE's transmission network generally follows the I-5/I-405 corridor through PSE's service territory. In addition, in King and Pierce Counties, backbone facilities parallel SR 167 between Renton and Puyallup and in Skagit County backbone facilities parallel SR 20 west of Sedro Woolley. Most 115kV lines in this corridor are designed to carry upwards of 200 megawatts (MWs). Generation projects in excess of 200 MWs may require multiple 115kV lines or an interconnection at 230kV. Outside of these corridors, PSE's lines may have even lower capabilities, thus limiting new generation projects to below 50 MWs without rebuilding or constructing new facilities.

Resources sited near bulk PSE transmission substations would likely require fewer upgrades. These locations include Sedro Woolley in Skagit County; Redmond, Renton, Kent and Covington in King County; Sumner in Pierce County; and East Lacey and West Olympia in Thurston County. In contrast, locations near existing generation sites are more likely to require transmission upgrades. These locations include Cherry Point, Sumas, and the Bellingham Port in Whatcom County; March Point, Fredonia, and Concrete/Baker Lake in Skagit County; and Frederickson in Pierce County.

In Kitsap and Jefferson Counties most transmission facilities could integrate projects up to 100 MWs.

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### **Inter-Area Transmission:**

#### PSE Merchant (PSEM) use of BPA transmission:

PSEM utilizes BPA's transmission to wheel off-system resources to serve loads throughout PSE's service territory. Often the use of BPA's transmission is in parallel with PSE's transmission capability. This results in the PSEM using a combination of PSE and BPA transmission to serve native load. Thus the availability of capacity on PSE's system is dependent on the PSEM's use of the parallel BPA system. In Jefferson and the bulk of Kitsap counties, PSEM relies entirely on BPA transmission to serve PSE's network load. Absent BPA transmission, PSE would have to build new transmission facilities to provide network service to loads in these two counties.

PSE has multiple ties with other transmission providers such as BPA and Seattle City Light. As an alternative to PSE network service, depending on availability of capacity, service may be provided through a combination of PSE transmission and additional service on an interconnected neighboring system.

#### Potential New Resources in Whatcom/Skagit/Island Counties:

Currently, the total generation of network resources in Whatcom, Skagit, and Island counties exceeds the corresponding load in these counties. As a result, the excess generation in these counties must be "exported" to other load south of Skagit County. This export can also include up to 428 MWs (PSE's North-to-South share of the Westside Northern Intertie, or WSNI, path) from the US-British Columbia Border into Whatcom County. Under heavy load conditions, when excess generation is minimized, PSE can wheel all of its excess generation to network load south of Skagit County. At the same time, however, PSE may be limited on its ability to deliver its share of imports from Canada south of Skagit County. Under light load conditions, limitations south of Skagit County may also limit the delivery of network generation resources. Construction of an additional 230kV transmission facility from Skagit County to southern Snohomish County has been identified as a potential solution to transmission limitations south of Skagit County. The new 230kV facility is estimated to cost from \$25 million to \$60 million.

Whatcom County land use restrictions preclude the construction of new 230kV transmission lines except in industrial areas and through existing transmission corridors. In addition, the restrictions limit flows on 115kV lines to an average of 150 MWs. These restrictions will complicate the integration of generation projects larger than 150 MWs in Whatcom County. Also, import capability on the WSNI may be limited under certain system configurations because of constraints south of Whatcom County. These constraints could also limit the ability to export new generation resources to network loads south of Whatcom County.

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### Potential New Resources in King and Pierce Counties:

Aside from local system upgrades, service to network load within King and Pierce Counties would require minimal transmission improvements. However, service to network load north of King County from new generation resources built in King and Pierce Counties, as well as new resources south of Pierce County, could be limited. This constraint could occur under low Whatcom/Skagit generation levels. In addition, within King County, constraints on BPA's Monroe-Echo Lake (Echo Lake is east of Renton) 500kV cutplane could limit service to loads north of Renton depending on Whatcom/Skagit generation levels and PSEM's use of its contractual capacity on BPA's system. To the south of Pierce County, PSE is limited in its ability to transmit generation to network loads in Thurston County. These restrictions would also depend upon PSEM's use of its contractual rights on BPA's parallel system.

### Potential New Resources in Thurston County:

PSE currently has no generation resources in Thurston County. Dependant on system loading, PSE's ability to transmit resources to network loads north of Thurston County may be constrained if generation exceeds PSE's Thurston County load level. The Thurston County winter peak loading is approximately 550 MWs.

### Potential New Resources in Kitsap County:

Transmission to Kitsap County is primarily provided via BPA's transmission system. New resources could not exceed existing load levels (winter peak approximately 500 MWs) and would be further constrained under off-peak conditions.

### Potential New Resources in Jefferson County:

Transmission to Jefferson County is provided via BPA's transmission system. New resources could not exceed existing load levels (winter peak approximately 85 MWs) and could be constrained under off-peak conditions.

### Potential New Resources in Kittitas County:

PSE is constrained in its ability to deliver network resources to loads external to Kittitas County. In addition, load levels in Kittitas County are relatively low (winter peak approximately 50 MWs). An \$80 million to \$120 million upgrade has been identified to allow the export of resources to the King County network.