

1.2 WHY IS THIS EIS BEING PREPARED?

Discussions between partner Cities and PSE determined that the proposal is likely to have significant adverse environmental impacts. Pursuant to SEPA, a Threshold Determination of Significance was issued as required in the Washington Administrative Code (WAC) 197-11-360 on April 30, 2015.

To address the potential for significant environmental impacts, PSE submitted an application for processing of an EIS with the City of Bellevue. As the largest and potentially most affected city, the City of Bellevue agreed with the other partner Cities to take the role of *lead agency*, consistent with WAC 197-11-944. The City of Bellevue is directing overall preparation of the EIS. Partner Cities including the Cities of Kirkland, Newcastle, Redmond, and Renton have reviewed preliminary versions of this Draft EIS and provided input on its preparation.

This Phase 1 Draft EIS is the first phase of a two-phase Draft EIS process to evaluate the potential for significant environmental impacts (see Section 1.5.1 for an explanation about the Phase 1 Draft EIS and the Phase 2 Draft EIS). The Phase 1 Draft EIS broadly evaluates the general impacts and implications associated with feasible and reasonable options available to address PSE's identified objectives for the project. The evaluations conducted during Phase 1 will be used to narrow the range of alternatives for consideration in the Phase 2 Draft EIS. The Phase 2 Draft EIS will be a project-level evaluation, describing impacts at a site-specific and project-specific level. This approach is consistent with the requirements for Phased Review outlined in WAC 197-11-060 (5)(c).

1.3 WHAT IS THE PURPOSE AND NEED FOR THE ENERGIZE EASTSIDE PROJECT?

PSE has determined that there is a need to construct a new 230 kV bulk electrical transmission line and an associated electrical substation east of Lake Washington to supply future electrical capacity and improve the reliability of the Eastside's electrical grid. PSE provided two documents that describe the need: the *Eastside Needs Assessment Report* and the *Supplemental Eastside Needs Assessment Report* (Gentile et al., 2014, 2015). These are referred to collectively as PSE's Eastside Needs Assessment.

What is bulk electrical transmission? Bulk electrical transmission is a system for transfer of electrical energy, from power generation plants to electrical substations near or within demand centers.

To better understand PSE's project proposal, the EIS Consultant Team obtained clearance and reviewed internal utility planning and operations information used by PSE in developing the Energize Eastside Project proposal. Because of security concerns, this information is released only to individuals with approved security clearance and who can meet other evaluation factors established by the Federal Energy Regulatory Commission (FERC) allowing restricted disclosure of Critical Energy Infrastructure Information (FERC, 2007).

The EIS Consultant Team, represented by Stantec (an electrical system planning and engineering subconsultant working in support of the Energize Eastside EIS effort), has reviewed this background information and studied the process used by PSE to establish a need for the proposed Energize Eastside Project. Stantec prepared a memorandum evaluating the stated need for the project, and confirmed that PSE's Eastside Needs Assessment was conducted in accordance with industry standards for utility planning (Stantec, 2015). See Appendix A for more information.

As outlined in WAC 197-11-060 (3)(a), it is the responsibility of the lead agency to make certain that a proposal that is the subject of environmental review is properly defined. The process of defining the proposal includes an objective understanding of the need for the project, to enable a thorough understanding of the project's objectives (see Chapter 2) and technical requirements, and in order to accurately identify feasible and reasonable project alternatives for consideration in the EIS. As noted in WAC 197-11-060(3)(a)(iii), proposals should be described in ways that encourage considering and comparing alternatives, and agencies are encouraged to describe proposals in terms of objectives rather than preferred solutions. An understanding of the need for the project helps in clarifying the objectives that have been used to develop the broad alternatives.

This EIS will not be used to reject or validate the need for the proposal. Rather, the EIS is intended to identify alternatives that could attain or approximate PSE's objectives at a lower environmental cost and disclose potential significant adverse environmental impacts associated with all alternatives identified.

The deficiency in transmission capacity on the Eastside that PSE has identified is based on a number of factors. It arises from growing population and employment, changing consumption patterns associated with larger buildings, more air-conditioned space, and a changing regulatory structure that requires a higher level of reliability than was required in the past. The regulatory changes that underlie the heightened concerns about reliability trace back to an August 2003 blackout in the midwestern and northeastern portions of North America that affected 55 million customers.¹ PSE has concluded that the most effective and cost-efficient solution to meet its objectives is to site a new 230 kV transformer in the center of the Eastside, which would be fed by new 230 kV transmission lines from the north and south (Stantec, 2015).

The population of the Eastside is expected to grow at a rate of approximately 1.2 percent annually over the next decade, and employment is expected to grow at an annual rate of approximately 2.1 percent, a projection based on internal forecasting conducted by PSE. For this forecast PSE used demographic data based on U.S. Census information and the Puget Sound Regional Council. PSE also relies on Moody's Analytics U.S. Macroeconomic Forecast, a long-term forecast for the U.S. economy, with adjustments for PSE's service territory using equations that relate national to regional conditions. Local economic data are provided by the Washington State Employment Security Department, U.S. Bureau of Labor

¹ See U.S. - Canada Power System Outage Task Force Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, April 2004.

CHAPTER 2. PROJECT ALTERNATIVES

2.1 WHAT DOES THIS CHAPTER COVER?

This chapter provides a description of project alternatives evaluated in the Draft Environmental Impact Statement (EIS). The alternatives described in this chapter were developed based on discussions between the partner Cities, the EIS Consultant Team, and Puget Sound Energy (PSE). This chapter also identifies alternatives considered but not evaluated in the Draft EIS because they did not meet PSE's project objectives. As required by the State Environmental Policy Act (SEPA), benefits and disadvantages of delaying PSE's project are described at the end of this chapter. The project includes numerous terms that may not be familiar to all readers. Words shown in *italics* when they first appear in the document are included in the Glossary following the Table of Contents.

2.2 WHAT ARE PUGET SOUND ENERGY'S PROJECT OBJECTIVES FOR ENERGIZE EASTSIDE?

Under SEPA, alternatives evaluated in an EIS must feasibly meet or approximate the project objectives. PSE, a regulated utility and the proponent for the Energize Eastside Project, developed the objectives of the proposal. Under SEPA, the objectives must be defined in a manner that does not preclude feasible alternatives that would have lower environmental costs (WAC 197-11-440(5)(b)).

As described in Chapter 1, the objectives for the project are to address a deficiency in transmission capacity on the Eastside that PSE expects will arise in the near future; find a cost-effective solution that can be implemented before system reliability is impaired; meet federal, state, and local regulatory requirements; and address PSE's electrical and non-electrical criteria for the project as outlined below. The transmission capacity deficiency PSE has identified is a product of the complex system that PSE uses to supply power to the Eastside, and the regulations PSE must follow as a utility provider making use of the regional electrical grid. As such, the criteria for what constitutes a viable solution are correspondingly complex.

The following is a list of project criteria from PSE's *Supplemental Eastside Solutions Study Report* (May, 2015) (Gentile et al., 2015). PSE's criteria are based on regulations for utilities and prudent, safe industry practices. They include 15 electrical criteria and 4 non-electrical criteria. The criteria are listed below, followed by a detailed explanation of each criterion in Sections 2.2.1 and 2.2.2. Background information regarding system contingencies and normal winter and summer load forecasts is provided in Sections 2.2.3 and 2.2.4.

Electrical Criteria Summary

The project would meet the following criteria:

1. Applicable transmission planning standards and guidelines, including mandatory North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) standards (e.g., NERC TPL-001-4 and WECC TPL-001-WECC-CRT-2);
2. Within study period (2015– 2024);
3. Less than or equal to 95 percent of emergency limits for lines;
4. Less than or equal to 90 percent emergency limit for transformers;
5. Normal winter load forecast with [both] 100 percent and 75 percent conservation;
6. Normal summer load forecast with 100 percent conservation;
7. Adjust regional flows and generation to stress cases similar to annual transmission planning assessment;
8. Take into account future transmission system improvement projects that are expected to be in service within the study period;
9. Minimal or no re-dispatching of generation;
10. No load shedding;
11. No new *Remedial Action Schemes*;
12. No *Corrective Action Plans*;
13. Must address all relevant PSE equipment violations;
14. Must not cause any adverse impacts to the reliability or operating characteristics of PSE's or surrounding systems; and
15. Must meet performance criteria listed above for 10 or more years after construction with up to 100 percent of the emergency limit for lines or transformers.

Non-electrical Criteria Summary

The project would meet or approximate the following criteria:

1. *Environmentally acceptable* to PSE and communities;
2. Constructible by winter of 2017 - 2018;
3. Utilize *proven technology* which can be controlled and operated at a system level; and
4. Reasonable project cost, as defined in Section 2.2.2.4.

Collectively, these criteria were considered the fullest expression of PSE's objectives in developing solutions for the Energize Eastside Project. The electrical criteria listed are generally in line with criteria used in the electrical industry. Therefore, these criteria were

used to identify reasonable alternatives for consideration in this EIS. The non-electrical criteria listed are typical of considerations made by utilities in project planning. While these are important in considering the solution, for this Phase 1 Draft EIS these criteria were generally not used to screen out alternatives.

Consideration of environmental impacts is part of the process for selecting alternatives under SEPA, in that alternatives considered in an EIS must approximate the proponent's objectives at a lower environmental cost. While the desired implementation schedule is important and reasonable, there are uncertainties associated with any of the alternatives including PSE's proposal that could delay implementation beyond these dates. With regard to what is considered proven technology, there is no clear-cut definition of what makes a technology proven. Therefore, a wide range of technologies that are in use at various scales have been evaluated, including some technologies that PSE does not currently utilize. For PSE, what constitutes reasonable cost is driven by PSE's responsibilities to deliver power at the lowest feasible cost to ratepayers. However, under SEPA, alternatives may be considered that are not the lowest feasible cost. For the Phase 1 Draft EIS alternatives, cost was not used to screen out any alternatives, in order to provide a more complete understanding of the environmental effects of alternatives before project-level alternatives are selected.

To clarify PSE's criteria for the community and decision-makers, PSE, the Eastside Cities, and the EIS Consultant Team developed brief explanatory descriptions for each criterion, provided in Sections 2.2.1 and 2.2.2. These descriptions were developed based on PSE documents and the EIS Consultant Team's familiarity with the power delivery system in western North America. The descriptions have been reviewed for accuracy and completeness by PSE and City staff with the five partner Eastside Cities that are leading this EIS process, and consulting electrical engineers on the EIS Consultant Team (Stantec).

2.2.1 Electrical Criteria

The electrical criteria used by PSE are briefly defined below.

2.2.1.1 *Applicable transmission planning standards and guidelines, including mandatory NERC and WECC standards*

These federal requirements mandate that PSE "shall demonstrate through a valid assessment that its portion of the interconnected transmission system is planned such that the Network can be operated to supply projected customer demands and projected Firm (non-recallable reserved) Transmission Services, at all demand levels over the range of forecast system demands" under NERC performance categories. Essentially, PSE must plan the system to function in scenarios where customer demand may be at its highest and/or elements of the system may be out of service. Below are examples of the standards and guidelines used during the PSE planning process.

2.2.1.1.1 N-0 Thermal and Voltage Performance – NERC and WECC standards

This refers to system performance with all system components operating normally. The system must perform without violations (exceedances) of thermal and voltage limits with all systems operating and no contingencies occurring. A contingency refers to a system