

**PUGET SOUND ENERGY**  
**2021 Integrated Resource Plan**

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**Work Plan**

April 1, 2020

## PURPOSE OF THE INTEGRATED RESOURCE PLAN

Puget Sound Energy (PSE) continues to invest in a long-term resource planning process to inform and guide the company's resource acquisition processes consistent with the Washington Administrative Code (WAC) 480-90-238 and WAC 480-100-238. PSE's Integrated Resource Plan (IRP) is a plan for meeting forecasted annual peak and energy demand, plus some established reserve margin, through a combination of energy supply, conservation, and other demand-side resources.

PSE's IRP analysis integrates demand-side and supply-side resources to meet the growing energy needs of its customers for the lowest reasonable cost. The 2021 IRP will implement new rules from the Clean Energy Transformation Act (CETA), signed into law in May 2019.

The IRP:

- Examines the many energy resource options available to PSE, including the maximum amount of new energy supply PSE can acquire through energy efficiency
- Makes a thorough, objective assessment of the benefits, costs, and risks associated with each energy-supply option
- Provides a resource adequacy assessment to ensure that all of PSE customer's load obligations are reliably met by building, or acquiring through contracts, sufficient generating capacity to be able to meet customer demand with appropriate planning margins
- Analyzes the region's population and economic trends, including a forecast of PSE customers' natural gas and electricity needs two decades into the future
- Evaluates political and economic policies and trends and their potential impact on energy production, usage, and availability
- Assesses commercially available conservation, including load management, as well as an assessment of currently employed and new policies and programs needed to obtain the conservation improvements
- Considers resource cost, market-volatility risks, demand-side resource uncertainties, resource dispatchability, resource effect on system operation, equity, risks imposed on ratepayers, public policies regarding resource preference adopted by Washington state or the federal government, and cost of risks associated with environmental effects including emissions of carbon dioxide
- Produces the Clean Energy Action Plan, which communicates the actions PSE intends to take over the next ten years to meet the goals of the Clean Energy Transformation Act

## PURPOSE OF THE IRP WORK PLAN

PSE develops a work plan to outline the IRP content and methods PSE will use to assess potential resources. The work plan also outlines PSE's approach to public involvement, including timing and extent.

The work plan meets the requirements listed in WAC Sections 480-90-238(4) and 480-100-238(4), the natural gas and electric IRP rules, and Section 480-90- 238(5) and 480-100-238(5).

## METHODS FOR ASSESSING RESOURCES

PSE's demand-side and supply-side resource analyses are well integrated, as are PSE's electric and gas resource planning efforts. The 2021 IRP analytical approach follows a similar process as the 2019 IRP but with key updates to ensure that the resource plan meets the goals of the Clean Energy Transformation Act.

The electric and gas analysis in the 2021 IRP will follow a six-step process outlined below.

### **1. Establish Resource Need**

Three types of resource need are identified: peak capacity need, renewable need and energy need. PSE will use its Resource Adequacy Model (RAM) to establish the peak capacity need for the electric portfolio and peak capacity contributions of generating resources using Monte-Carlo style risk analysis.

### **2. Determine Planning Assumptions and Identify Resource Alternatives**

The AURORA model will be used for electric price forecasting, and conducting stochastic risk analysis of the electric market prices. PSE will analyze potential futures through scenarios and sensitivities that will have different gas prices, electric prices, electric demand, environmental policies, and supply-side and demand-side resource alternatives. Scenarios and sensitivities are analyzed using deterministic and stochastic risk analysis. Sensitivities determine how different potential futures and factors affect resource strategies, costs, emissions, and risks. PSE contracted with The Cadmus Group to conduct energy efficiency and demand response potential studies.

### **3. Analyze Alternatives and Portfolios using Deterministic and Stochastic Risk Analysis**

Deterministic analysis identifies the least-cost mix of demand-side and supply-side resources that will meet need, given the set of static assumptions defined in the scenario or sensitivity. All scenarios and sensitivities were analyzed using deterministic optimization analysis.

Stochastic risk analysis deliberately varies the static inputs to the deterministic analysis, to test how the different portfolios developed in the deterministic analysis perform with regard to cost and risk across a wide range of potential future power prices, gas prices, hydro generation, wind generation, loads, and plant forced outages.

The AURORA model is also used for portfolio optimization to select PSE's Resource Portfolio and alternative scenario portfolios. The AURORA portfolio model is a linear programming optimization model that will optimize the portfolio given the objective function to minimize the portfolio cost and the constraints to: 1) meet peak capacity need from the RAM model, 2) meet the hourly energy need, and 3) meet the renewable requirements from the Energy Independence Act and the Clean Energy Transformation Act. PSE will utilize the Plexos model to conduct analyses to evaluate reserve requirements such as ancillary services needed to support integration of intermittent generating resources. Sendout will be utilized for the gas portfolio modeling.

### **4. Analyze Results**

Results of the quantitative analysis – both deterministic and stochastic – are studied to understand the key findings that lead to decisions about the resource plan forecast. Results of the quantitative analysis – both deterministic and stochastic – are studied to understand the key findings that lead to decisions about the resource plan forecast and the Clean Energy Action Plan.

### **5. Develop Resource Plan**

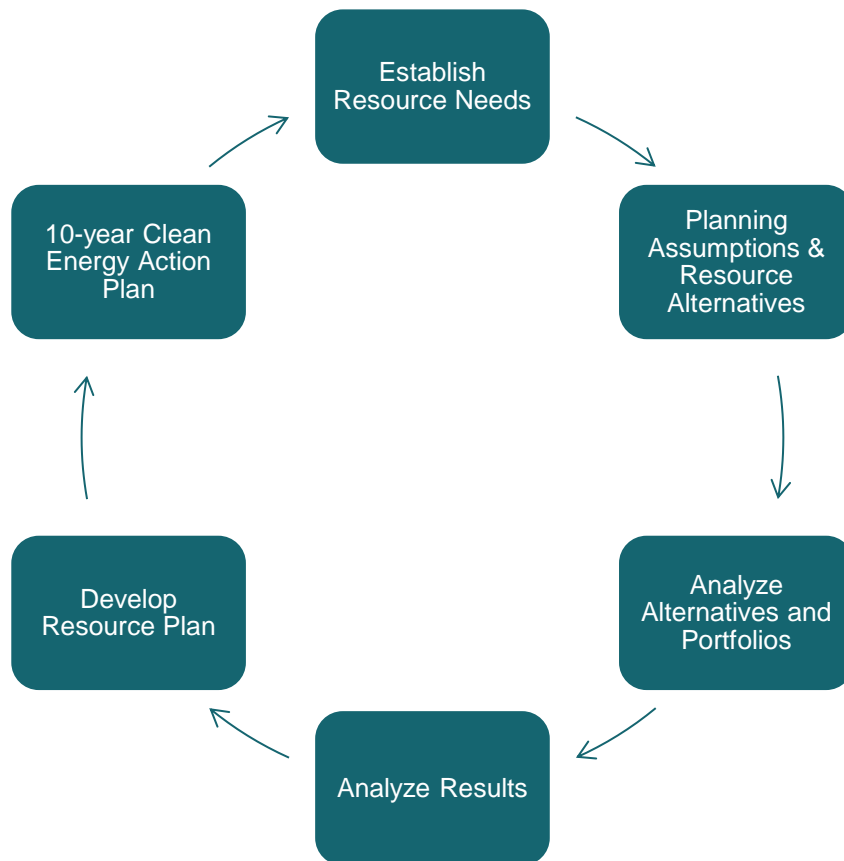
Taking all the analysis into consideration, a final Resource Plan is created with a lowest reasonable cost portfolio for the 20-year time horizon.

**6. Create the 10-Year Clean Energy Action Plan**

Resource decisions are not made in the IRP. What we learn from the IRP forecasting exercise and the development of the Resource Plan determines the Clean Energy Action Plan. The Clean Energy Action Plan takes into consideration equity and other factors and communicates the actions PSE plans to take to meet the resource needs over the next 10 years. The Clean Energy Action Plan informs the 4-year Clean Energy Implementation Plan (CEIP).

Figure 1 illustrates this process.

Figure 1: 2021 IRP Process



## 2021 IRP CONTENT OUTLINE

The following is a draft outline of the 2021 IRP. PSE may revise the organizational structure based on results of analysis and stakeholder feedback through the planning process. The draft 2021 IRP will be available for public review and comments by January 4, 2021. The final 2021 IRP will be filed with the WUTC by April 1, 2021. It is anticipated that the Clean Energy Implementation Plan will be filed in the second half of 2021.

### Chapters

1. Executive Summary
2. 10-Year Clean Energy Action Plan
3. Resource Plan Decisions
4. CETA and Other Factors
5. Key Analytical Assumptions
6. Demand Forecast
7. Electric Analysis
8. Gas Analysis

### Appendices

- A. Public Participation
- B. Legal Requirements
- C. Environmental Regulations
- D. Electric Resource Alternatives and Costs
- E. Conservation Potential Assessment
- F. Demand Forecasting Models
- G. Electric Analysis Models
- H. Electric Analysis Inputs and Results
- I. Gas Analysis Resources
- J. Resource Adequacy Analysis
- K. Regional Transmission Planning
- L. Delivery System Planning
- M. Vulnerable Populations and Cumulative Impact Assessments

## PUBLIC PARTICIPATION

### Background

PSE believes stakeholder input can and should improve the 2021 IRP and is committed to increasing public participation from previous IRPs. PSE has worked with stakeholders to receive feedback on plan components as part of the development process for previous IRPs. During previous processes, PSE received feedback requesting they provide stakeholders with a clearer understanding of where stakeholders can influence PSE decisions and IRP outcomes. Those stakeholders wanted to know when PSE was providing information to keep the public informed, when PSE would like feedback from stakeholders on their work, and when PSE needed suggestions and insight from stakeholders to make decisions, and what the outcomes of those decisions would be. Some stakeholders recommended that PSE follow the International Association for Public Participation (IAP2) methodology for designing and implementing effective public involvement processes.

As a result of stakeholder feedback, PSE developed a public participation plan which clarifies the role

the public will play in the development of the 2021 IRP and follows the IAP2 methodology. PSE will engage the public by informing stakeholders of plan components as they are developed, requesting feedback from stakeholders on project components at key decision points, and consulting with stakeholders to gain input from industry experts and interest groups. This public participation plan will be a foundation for public participation for future IRP processes, which will have a longer timeline for reaching out to and involving stakeholders. Future WUTC rulemaking may further clarify future public participation plan formats and requirements.

## Plan Development

To begin planning for IRP public participation, the project team participated in a workshop led by EnviroIssues, a public participation consulting firm. At the workshop, the project team identified possible audiences and stakeholders who may be interested in or impacted by the IRP. The team then brainstormed possible issues, concerns and aspirations the various audiences may have regarding the IRP and its implementation. The technical team and EnviroIssues then worked to correlate those audiences and issues, tracking which issues may be most important to each audience.

The correlation was used to identify the level of impact the IRP could have on each audience. The audiences were then sorted into categories and prioritized by the relative level of impact and/or interest for each audience. The assessment resulted in three tiers of stakeholders: primary, secondary and tertiary. The team was careful to recognize that the assessment was only a snapshot and that ongoing adjustments and clarifications would be necessary throughout the process as more was learned from different audiences and as audiences became more or less interested throughout the process.

After identifying the stakeholders for the 2021 IRP, the project team worked to identify the level of influence stakeholders can have on the IRP and used this influence to develop participation goals for the overall public participation process. IAP2 uses a framework for the level of influence stakeholders can have in a public process called the Spectrum of Public Participation ([Spectrum](#)). To determine the location of stakeholders on this spectrum, the project team considered how stakeholder input will be used, what stakeholder input can change, and how stakeholder input will affect the subsequent planning processes in the long term.

The levels of engagement used on the IAP2 Spectrum are defined as follows:

- Inform** - To provide the public with balanced and objective information to assist them in understanding the problem, alternatives and/or solutions.
- Consult** - To obtain public feedback on analysis, alternatives and/or decision.
- Involve** - To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.
- Collaborate** - To partner with the public in each aspect of the decision including the development of alternatives and the preferred solution.
- Empower** - To place final decision-making in the hands of the public.

The IAP2 framework for effective public participation identifies the need for strong linkages and integration of public participation and technical work. In order to identify the key project milestones and decision points where stakeholders should be informed, or where PSE should work with stakeholders to receive input on project components, EnviroIssues worked with the IRP technical team in a second workshop to align technical work with specific participation objectives and place them on the IRP development timeline. Clear objectives then lead to selection of participation techniques that will allow PSE to meet those objectives. The Public Participation Plan included in Appendix A describes how the coordination of project milestones, participation objectives and techniques align and when stakeholders will have opportunities to provide input and feedback to specific IRP topics.