



2021 PSE Integrated Resource Plan

B

Legal Requirements

This appendix identifies where each of the regulatory requirements for the electric and natural gas integrated resource plans is addressed within the IRP and reports on the progress of the 2017 IRP electric and natural gas utility action plans, the last IRP filed. It also delivers two additional reports.



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1. CLEAN ENERGY TRANSFORMATION ACT (CETA)

On May 7, 2019, Governor Jay Inslee signed into law the Clean Energy Transformation Act (CETA), which commits Washington to an electricity supply free of greenhouse gas emissions by 2045. The CETA applies to all electric utilities serving retail customers in Washington (such as PSE) and sets specific milestones to reach the required 100 percent clean electricity supply. The first milestone is October 1, 2021 when PSE must prepare and publish a clean energy implementation plan (CEIP) with its own targets for energy efficiency, demand response and renewable energy. The draft CEIP filing is due on August 15, 2021.

By the end of 2025, PSE must eliminate coal-fired electricity from its state portfolios. The first clean energy standard applies in 2030. The 2030 standard is greenhouse gas neutral, which means that PSE will have the flexibility to use limited amounts of electricity from greenhouse gas emitting resources if those resources are offset by other actions, such as procurement of renewable energy credits. By 2045, PSE must supply customers in Washington with electricity that is 100 percent renewable or non-emitting, with no provision for offsets.

Coal Phase-out Requirement

The CETA requires PSE to eliminate coal-fired resources from its allocation of electricity sold to retail customers in its service territory by December 31, 2025. For the purposes of this standard, a “coal-fired resource” does not include:

- an electric generating facility that is subject to an obligation to meet the state's Greenhouse Gas Emissions Performance Standard (i.e., the TransAlta Centralia Coal Plant); or
- an electric generation facility that is included as part of certain limited duration wholesale power purchases, not to exceed one month, for which the source of the power is not known at the time of entry into the transaction to procure the electricity (i.e., short-term transactions of undifferentiated electricity).

The Washington Utilities and Transportation Commission (Commission) must accelerate depreciation for any coal-fired resource owned by PSE and is allowed to accelerate depreciation for any qualified transmission line to no later than December 31, 2025. Additionally, the Commission must allow in rates prudently incurred undepreciated investments in a fossil-fuel generating resource that has been retired from service under specific conditions.



Greenhouse Gas Neutral Standard (January 1, 2030 - December 31, 2044)

The CETA will require PSE to make all retail sales of electricity to Washington customers greenhouse gas neutral for multi-year compliance periods beginning January 1, 2030, and ending December 31, 2044. To achieve compliance with this standard, PSE must:

- pursue all cost-effective, reliable, and feasible conservation and efficiency resources and demand response resources to reduce or manage electric retail load; and
- use electricity from renewable resources and non-emitting electric generation (or alternative compliance options, discussed below) in an amount equal to 100 percent of PSE's average annual retail electric load over each multiyear compliance period.

All renewable resources used to meet the compliance obligation must be verified using renewable energy credits and must be tracked and retired in the tracking system selected by the Department of Commerce. Non-emitting generation resources used to meet the obligation must be generated during the compliance period and must be verified by documentation that PSE owns the non-power attributes of the electricity.

In complying with the greenhouse gas neutral standard and clean energy standard, PSE may not use hydroelectric generation that requires new diversions, impoundments, bypass reaches or expansion of existing reservoirs, unless otherwise required for the operation of a pumped storage facility. PSE may, however, make efficiency or other improvements to its existing facilities and may install hydroelectric generation in pipes, culverts, irrigation canals and other manmade waterways. Nothing in the greenhouse gas neutral or clean energy standards prohibits PSE from purchasing from or exchanging power with the Bonneville Power Administration (BPA).



Alternative Compliance Option

PSE may satisfy up to 20 percent of the greenhouse gas neutral standard with an alternative compliance option for the greenhouse gas neutral standard compliance period beginning January 1, 2030 and ending December 31, 2044. An alternative compliance option includes any combination of the following:

- making an alternative compliance payment in an amount equal to the administrative penalty discussed below;
- purchasing unbundled renewable energy credits;
- investing in energy transformation projects associated with the consumption of energy in Washington and that meet criteria and quality standards developed by the Department of Ecology, in consultation with the Department of Commerce and the Commission; or
- using electricity from an energy recovery facility using municipal solid waste as the principal fuel source, where the facility was constructed prior to 1992 and is in compliance with federal and state air quality standards.

Administrative Penalty

If PSE were to fail to comply with the coal phase-out or carbon neutral standards, PSE must pay an administrative penalty equal to the product of 1) \$100/MWh of emitting or unspecified electric generation used to meet PSE's retail electric load times 2) the following multipliers

- 1.5 for coal-fired resources;
- 0.84 for gas-fired peaking power plants; and
- 0.60 for gas-fired combined-cycle power plants.

The penalty is adjusted for inflation, beginning in 2027. Beginning in 2040, the Commission may increase the penalty for PSE to accelerate compliance.

The Commission may relieve PSE of its penalty obligation under the greenhouse gas neutral standard if it finds that PSE's compliance is likely to result in conflicts with or compromises to its obligation to comply with North American Electric Reliability Corporation (NERC) reliability standards, violate prudent utility practice for assuring resource adequacy, compromise the power quality or integrity of its system, or due to factors reasonably outside PSE's control. Additionally, the Governor may waive a penalty by declaring an energy emergency under current law, if the Department of Commerce's report demonstrates adverse system reliability impacts due to implementation of the coal phase-out or greenhouse gas neutral standards.



Clean Energy Standard (Beginning January 1, 2045)

By January 1, 2045, PSE must meet 100 percent of its retail electric load to Washington customers using non-emitting electric generation and electricity from renewable resources. The Commission, the Department of Commerce, the Energy Facility Site Evaluation Council, the Department of Ecology and all other state agencies must incorporate this standard into all relevant planning and use all statutory programs to achieve the standard.

In planning to meet projected demand, PSE must, consistent with the requirements of the Energy Independence Act, pursue all cost-effective, reliable, and feasible conservation efficiency resources, and demand response. In making new investments, PSE must, and to the maximum extent feasible, 1) achieve targets at the lowest reasonable cost; 2) consider acquisition of surplus renewable resources; and 3) rely on renewable resources and energy storage in the acquisition of new resources.

Energy Resource Planning

Integrated Resource Plans and the Clean Energy Action Plan

The CETA requires PSE to consider the following elements in its Integrated Resource Plans:

- an assessment and 10-year forecast of the availability of regional generation and transmission capacity on which PSE may rely to provide and deliver electricity to its customers;
- a determination of resource adequacy metrics for the resource plan consistent with the forecasts;
- a forecast of distributed energy resources that may be installed by PSE's customers and an assessment of their effect on PSE's load and operations;
- an assessment, informed by the Department of Health's Cumulative Impact Analysis, "of energy and nonenergy benefits and reductions of burdens to vulnerable populations and highly impacted communities; long-term and short-term public health and environmental benefits, costs and risks; and energy security and risk;" and
- a 10-Year Clean Energy Action Plan for implementing the coal phase-out standard, the greenhouse gas neutral standard, and the clean energy standard at the lowest reasonable cost, and at an acceptable resource adequacy standard, that identifies the specific actions to be taken by PSE consistent with the long-range IRP.



The CETA requires PSE to consider the social cost of greenhouse gas emissions when developing its Integrated Resource Plan and Clean Energy Action Plan. PSE must incorporate the social cost of greenhouse gas emissions as a cost adder when evaluating and selecting conservation policies, programs and targets and evaluating and selecting intermediate-term and long-term resource options. The cost of greenhouse gas emissions resulting from the generation of electricity is equal to the cost per metric ton of carbon dioxide equivalent emissions, using the 2.5 percent discount rate published by the United States government Interagency Working Group on the Social Cost of Greenhouse Gases.

Clean Energy Implementation Plan

By January 1, 2022, and every four years thereafter, the CETA requires PSE to develop and submit to the Commission 1) a four-year Clean Energy Implementation Plan for the greenhouse gas neutral standard and clean energy standard and 2) proposed interim targets for meeting the greenhouse gas neutral standard during the years prior to January 1, 2030, and for the period beginning on January 1, 2030 and ending on December 31, 2044.

The Clean Energy Implementation Plan must

- be informed by PSE's Clean Energy Action Plan and
- identify specific actions to be taken by PSE over the next four years, consistent with PSE's Integrated Resource Plan and resource adequacy requirements, that demonstrate progress toward meeting (i) the interim targets proposed along with the clean energy implementation plan, (ii) the greenhouse gas neutral standard, and (iii) the clean energy standard.

The specific actions identified in the Clean Energy Implementation Plan must be informed by PSE's historic performance under median water conditions and resource capability and its participation in centralized markets. In identifying specific actions in its Clean Energy Implementation Plan, PSE may also take into consideration any significant and unplanned loss or addition of load it experiences.

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The Commission, after a hearing, must by order approve, reject, or approve with conditions PSE's Clean Energy Implementation Plan and interim targets. The Commission may, in its order, recommend or require more stringent targets than those proposed by PSE. The Commission may periodically adjust or expedite timelines if it can be demonstrated that the targets or timelines can be achieved in a manner consistent with the following:

1. maintaining and protecting the safety, reliable operation, and balancing of the electric system;
2. planning to meet the standards at the lowest reasonable cost, considering risk;
3. ensuring that all customers are benefiting from the transition to clean energy; and
4. ensuring that no customer or class of customers is unreasonably harmed by any resulting increases in the cost of PSE-supplied electricity as may be necessary to comply with the standards.

CETA Rulemakings

The Commission finished three major CETA rulemaking efforts at the end of 2020 and issued final rules on December 29, 2020. The new CETA rules set up a procedural framework within which utilities must plan for and acquire clean energy resources to comply with CETA. The new rules make considerable changes to existing rules for electric Integrated Resource Plans, which are detailed in Tables B-3 and B-5 below.



2. REGULATORY REQUIREMENTS

Figure B-1 lists the statutory requirements in the CETA that apply to electric IRPs. Figure B-2 lists the regulatory requirements for electric utilities codified in WAC RCW 19.280.100. Figure B-3 lists the regulatory requirements previously codified in WAC 480-100-238, now included in WAC 480-100-620 and WAC 480-100-625, that apply to electric integrated resource plans.¹ B-4 lists the regulatory requirements currently in effect in WAC 480-90-238 that apply to natural gas integrated resource plans. These tables identify the chapters and appendices of this plan that address each requirement. Figure B-5 details an additional condition pursuant to WUTC Order 01, dated April 13, 2017 in PSE’s 2017 docket. Other conditions in Order 01 were addressed in the 2017 IRP. Figure B-6 details natural gas utility requirements pursuant to HB 1257.²

Figure B-1: Electric Utility Integrated Resource Plan Regulatory Requirements in the CETA

Statutory or Regulatory Requirement	Chapter and/or Appendix
RCW 19.280.030 (1) (a) A range of forecasts, for at least the next ten years or longer, of projected customer demand which takes into account econometric data and customer usage.	Chapter 5, Key Analytical Assumptions Chapter 6, Demand Forecasts Appendix F, Demand Forecasting Models
RCW 19.280.030 (1) (b) An assessment of commercially available conservation and efficiency resources. Such assessment may include, as appropriate, opportunities for development of combined heat and power as an energy and capacity resource, demand response and load management programs, and currently employed and new policies and programs needed to obtain the conservation and efficiency resources.	Chapter 8, Electric Analysis Appendix E, Conservation Potential Assessment and Demand Response Assessment Appendix H, Electric Analysis Inputs and Results
RCW 19.280.030 (1) (c) An assessment of commercially available, utility scale renewable and nonrenewable generating technologies including a comparison of the benefits and risks of purchasing power or building new resources.	Chapter 4, Planning Environment Chapter 7, Resource Adequacy Analysis Chapter 8, Electric Analysis Appendix D, Electric Resources and Alternatives Appendix H, Electric Analysis Inputs and Results

¹ / The Commission adopted new IRP rules on December 28, 2020, which took effect December 31, 2020. In adopting new IRP rules, the Commission intends to replace the rules previously codified in WAC 480-100-238. The process to repeal WAC 480-100-238 is underway at the Commission as an expedited, emergency rulemaking.

² / The Commission anticipates rulemaking in 2021 to develop rules for natural gas utilities pursuant to HB 1257.

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>RCW 19.280.030 (1) (d) A comparative evaluation of renewable and nonrenewable generating resources, including transmission and distribution delivery costs, and conservation and efficiency resources using "lowest reasonable cost" as a criterion.</p>	<p>Chapter 3, Resource Plan Decisions Chapter 8, Electric Analysis Chapter 10, Delivery System Planning Appendix D, Electric Resources and Alternatives Appendix E, Conservation Potential Assessment and Demand Response Assessment Appendix H, Electric Analysis Inputs and Results Appendix J, Regional Transmission Resources</p>
<p>RCW 19.280.030 (1) (e) An assessment of methods, commercially available technologies, or facilities for integrating renewable resources, and addressing overgeneration events, if applicable to the utility's resource portfolio.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix D, Electric Resources and Alternatives Appendix H, Electric Analysis Inputs and Results</p>
<p>RCW 19.280.030 (1) (f) An assessment and ten-year forecast of the availability of regional generation and transmission capacity on which the utility may rely to provide and deliver electricity to its customers..</p>	<p>Chapter 3, Resource Plan Decisions Chapter 7, Resource Adequacy Analysis Chapter 8, Electric Analysis Appendix J, Regional Transmission Resources</p>
<p>RCW 19.280.030 (1) (g) A determination of resource adequacy metrics for the resource plan consistent with the forecasts.</p>	<p>Chapter 1, Executive Summary Chapter 7, Resource Adequacy Analysis Chapter 8, Electric Analysis Appendix G, Electric Analysis Models Appendix H, Electric Analysis Inputs and Results</p>
<p>RCW 19.280.030 (1) (h) A forecast of distributed energy resources that may be installed by the utility's customers and an assessment of their effect on the utility's load and operations.</p>	<p>Appendix E, Conservation Potential Assessment and Demand Response Assessment Chapter 5, Key Analytical Assumptions</p>
<p>RCW 19.280.030 (1) (i) An identification of an appropriate resource adequacy requirement and measurement metric consistent with prudent utility practice in implementing sections 3 through 5 of CETA.</p>	<p>Chapter 7, Resource Adequacy Analysis Chapter 8, Electric Analysis Appendix G, Electric Analysis Models</p>

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>RCW 19.280.030 (1) (j) The integration of the demand forecasts, resource evaluations, and resource adequacy requirement into a long-range assessment describing the mix of supply side generating resources and conservation and efficiency resources that will meet current and projected needs, including mitigating overgeneration events and implementing sections 3 through 5 of CETA, at the lowest reasonable cost and risk to the utility and its customers, while maintaining and protecting the safety, reliability operation, and balancing of its electric system.</p>	<p>Chapter 1, Executive Summary Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions</p>
<p>RCW 19.280.030 (1) (k) An assessment, informed by the cumulative impact analysis conducted under section 24 of CETA of: Energy and nonenergy benefits and reductions of burdens to vulnerable populations and highly impacted communities; long-term and short-term public health and environmental benefits, costs, and risks, and energy security and risk.</p>	<p>Chapter 2, Clean Energy Action Plan Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions</p>
<p>RCW 19.280.030 (1) (l) A ten-year clean energy action plan for implementing sections 3 through 5 of CETA at the lowest reasonable cost, and at an acceptable resource adequacy standard, that identifies the specific actions to be taken by the utility consistent with the long-range integrated resource plan.</p>	<p>Chapter 2, Clean Energy Action Plan</p>
<p>RCW 19.208.030 (3)(a) An electric utility shall consider the social cost of greenhouse gas emissions, as determined by the commission for investor-owned utilities, pursuant to section 15 of CETA when developing integrated resource plans and clean energy action plans.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix H, Electric Analysis Inputs and Results</p>

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Figure B-2: Electric Utility Integrated Resource Plan Regulatory Requirements
Codified in WAC RCW 19.280.100

Statutory or Regulatory Requirement	Discussion
<p>RCW 19.280.100. (2) (a) Identify the data gaps that impede a robust planning process as well as any upgrades, such as but not limited to advanced metering and grid monitoring equipment, enhanced planning simulation tools, and potential cooperative efforts with other utilities in developing tools needed to obtain data that would allow the electric utility to quantify the locational and temporal value of resources on the distribution system;</p>	<p>Chapter 2, Clean Energy Action Plan Appendix M, Delivery System 10-Year Plan</p>
<p>RCW 19.280.100. (2) (b) Propose monitoring, control, and metering upgrades that are supported by a business case identifying how those upgrades will be leveraged to provide net benefits for customers;</p>	<p>Chapter 2, Clean Energy Action Plan Appendix M, Delivery System 10-Year Plan</p>
<p>RCW 19.280.100. (2) (c) Identify potential programs that are cost-effective and tariffs to fairly compensate customers for the actual monetizable value of their distributed energy resources, including benefits and any related implementation and integration costs of distributed energy resources, and enable their optimal usage while also ensuring reliability of electricity service, such as programs benefiting low-income customers;</p>	<p>Programs will be identified through the CEIP process and through engagement with the Equity Advisory Group. PSE is pursuing an Alternative Pricing pilot.</p>
<p>RCW 19.280.100. (2) (d) Forecast, using probabilistic models if available, the growth of distributed energy resources on the utility's distribution system;</p>	<p>Appendix E, Conservation Potential Assessment and Demand Response Assessment</p>

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Statutory or Regulatory Requirement	Discussion
<p>RCW 19.280.100. (2) (e) Provide, at a minimum, a ten-year plan for distribution system investments and an analysis of nonwires alternatives for major transmission and distribution investments as deemed necessary by the governing body, in the case of a consumer-owned utility, or the commission, in the case of an investor-owned utility.</p> <p>This plan should include a process whereby near-term assumptions, any pilots or procurements initiated in accordance with subsection (3) of this section or data gathered via current market research into a similar type of utility or other cost/benefit studies, regularly inform and adjust the long-term projections of the plan. The goal of the plan should be to provide the most affordable investments for all customers and avoid reactive expenditures to accommodate unanticipated growth in distributed energy resources. An analysis that fairly considers wire-based and nonwires alternatives on equal terms is foundational to achieving this goal. The electric utility should be financially indifferent to the technology that is used to meet a particular resource need.</p> <p>The distribution system investment planning process should utilize a transparent approach that involves opportunities for stakeholder input and feedback.</p> <p>The electric utility must identify in the plan the sources of information it relied upon, including peer-reviewed science.</p> <p>Any cost-benefit analysis conducted as part of the plan must also include at least one pessimistic scenario constructed from reasonable assumptions and modeling choices that would produce comparatively high probable costs and comparatively low probable benefits, and at least one optimistic scenario constructed from reasonable assumptions and modeling choices that would produce comparatively low probable costs and comparatively high probable benefits;</p>	<p>Chapter 4, Planning Environment Appendix A, Public Participation Appendix M, Delivery System 10-Year Plan</p>

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Statutory or Regulatory Requirement	Discussion
<p>RCW 19.280.100. (2) (f) Include the distributed energy resources identified in the plan in the electric utility's integrated resource plan developed under this chapter. Distribution system plans should be used as inputs to the integrated resource planning process. Distributed energy resources may be used to meet system needs when they are not needed to meet a local distribution need. Including select distributed energy resources in the integrated resource planning process allows those resources to displace or delay system resources in the integrated resource plan;</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 5, Key Analytic Assumptions Appendix M, Delivery System 10-Year Plan</p>
<p>RCW 19.280.100. (2) (g) Include a high level discussion of how the electric utility is adapting cybersecurity and data privacy practices to the changing distribution system and the internet of things, including an assessment of the costs associated with ensuring customer privacy; and</p>	<p>Chapter 2, Clean Energy Action Plan Appendix M, Delivery System 10-Year Plan</p>
<p>RCW 19.280.100. (2) (h) Include a discussion of lessons learned from the planning cycle and identify process and data improvements planned for the next cycle.</p>	<p>Appendix M, Delivery System 10-Year Plan</p>
<p>RCW 19.280.100. (3) To ensure that procurement decisions are based on current cost and performance data for distributed energy resources, a utility may procure cost-effective distributed energy resource needs as identified in any distributed energy resources plan through a process that is price-based and technology neutral. Electric utilities should consider using competitive procurements tailored to meet a specific need, which may increase the utility's ability to identify the lowest cost and most efficient means of meeting distribution system needs. If the projected cost of a procurement is more than the calculated system net benefit of the identified distributed energy resources, the governing body, in the case of a consumer-owned utility, or the commission, in the case of an investor-owned utility, may approve a pilot process by which the electric utility will gain a better understanding of the costs and benefits of a distributed energy resource or resources.</p>	<p>Further work will be done through the Clean Energy Implementation Plan</p>

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Figure B-3: Electric Utility Integrated Resource Plan Regulatory Requirements
Codified in WAC 480-100-620 and 480-100-625

Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-100-620 (2) A range of forecasts of projected customer demand that reflect the effect of economic forces on the consumption of electricity and that address changes in the number, type and efficiency of electrical end-uses.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 6, Demand Forecasts Appendix F, Demand Forecasting Models</p>
<p>WAC 480-100-620 (3) (a) Assessments of a variety of distributed energy resources. These assessments must incorporate nonenergy costs and benefits.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix M, Delivery System 10-Year Plan</p>
<p>WAC 480-100-620 (3) (b) (i) an assessment of currently employed and potential policies and programs needed to obtain all cost-effective conservation, efficiency and load management improvements.</p>	<p>Chapter 8, Electric Analysis Appendix E, Conservation Potential Assessment and Demand Response Assessment</p>
<p>WAC 480-100-620 (3) (b) (ii) Assess currently employed and new policies and programs needed to obtain all cost-effective demand response.</p>	<p>Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix M, Delivery System 10-Year Plan Appendix E, Conservation Potential Assessment and Demand Response Assessment</p>

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-100-620 (3) (b) (iii) Include distributed energy programs and mechanisms identified pertaining to energy assistance.</p>	<p>By July 31, 2021, PSE will provide an assessment to the Department of Commerce of mechanisms pertaining to energy assistance, as well as progress toward meeting customer energy assistance need. Existing PSE programs include bill assistance and weatherization services. Currently, PSE does not have any distributed energy resource (DER) programs as part of its energy assistance strategy. However, in future years, there may be programs and mechanisms that could be used to meet customer energy assistance need, and those programs will be considered and incorporated into the IRP as indicated in draft WAC 480-100-610(3). In examining energy assistance need, PSE will continue review of its recently completed Low-income Needs Assessment. In addition, PSE will conduct further qualitative research and analysis to better understand the barriers to serving low-income customers in order to encourage further participation of income-eligible households in the weatherization and bill assistance programs.</p>
<p>WAC 480-100-620 (3) (b) (iv) Assess other distributed energy resources that may be installed by the utility or the utility's customers including energy storage, electric vehicles, and PV.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix M, Delivery System 10-Year Plan</p>
<p>WAC 480-100-620 (4) An assessment of a wide range of commercially available generating and nonconventional technologies.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix D, Electric Resources and Alternatives Appendix H, Electric Analysis Inputs and Results</p>
<p>WAC 480-100-620 (5) An assessment of methods, commercially available technologies, or facilities for integrating renewable resources and addressing overgeneration events, if applicable to the utility's resource portfolio.</p>	<p>Chapter 8, Electric Analysis Appendix D, Electric Resources and Alternatives Appendix H, Electric Analysis Inputs and Results</p>

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-100-620 (6) An assessment of regional generation and transmission capacity. Must include the utility's existing transmission capabilities, and future resource needs. Must identify the general location and extent of transfer capability limitations on its transmission network.</p>	<p>Appendix J, Regional Transmission Resources Appendix M, Delivery System 10-Year Plan</p>
<p>WAC 480-100-620 (7) A comparative evaluation of all identified resources and potential changes to existing resources for achieving the clean energy transformation standards in WAC 480-100-610 at the lowest reasonable cost.</p>	<p>Chapter 3, Resource Plan Decisions Chapter 8, Electric Analysis Appendix D, Electric Resources and Alternatives Appendix E, Conservation Potential Assessment and Demand Response Assessment Appendix H, Electric Analysis Inputs and Results Appendix J, Regional Transmission Resources Appendix M, Delivery System 10-Year Plan</p>
<p>WAC 480-100-620 (8) An assessment and determination of resource adequacy metrics and an appropriate resource adequacy requirement and measurement metrics consistent with CETA.</p>	<p>Chapter 7, Resource Adequacy Analysis</p>
<p>WAC 480-100-620 (9) An assessment of energy and nonenergy benefits and reductions of burdens to vulnerable populations and highly impacted communities; long-term and short-term public health and environmental benefits, costs, and risks; and energy security risk, informed by the cumulative impact analysis conducted by the department of health.</p>	<p>Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions</p>
<p>WAC 480-100-620 (10) (a) At least one scenario must describe the lowest reasonable cost and reasonably available portfolio that the utility would have implemented if not for CETA requirements in RCW 19.405.040 and 19.405.050.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix H, Electric Analysis Inputs and Results</p>
<p>WAC 480-100-620 (10) (b) At least one scenario must be a future climate change scenario.</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix H, Electric Analysis Inputs and Results</p>
<p>WAC 480-100-620 (10) (c) At least one sensitivity must be a maximum customer benefit scenario. The sensitivity should model the maximum amount of customer benefits described in RCW 19.405.040(8).</p>	<p>Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis Appendix H, Electric Analysis Inputs and Results</p>

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-100-620 (11) Integration of the demand forecasts and resource evaluations into a long-range integrated resource plan describing the mix of resources that meet current and projected resource needs.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 6, Demand Forecasts Appendix F, Demand Forecasting Models</p>
<p>WAC 480-100-620 (11) (a) A narrative description of decisions made including how the IRP expects to achieve the clean energy transformation standards at lowest cost.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions</p>
<p>WAC 480-100-620 (11) (b) A narrative description of decisions made including how the IRP expects to serve utility load, based on hourly data with the output of the utility's owned resources, market purchases, and power purchase agreements net of any off-system sales.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (c) A narrative description of decisions made including how the IRP expects to include all cost-effective, reliable and feasible conservation and efficiency and demand response resources.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (d) A narrative description of decisions made including how the IRP expects to consider acquisition of existing renewable resources.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (e) A narrative description of decisions made including how the IRP expects in the acquisition of new resources, to rely on renewable resources and energy storage in so far as doing so is at the lowest reasonable cost.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (f) A narrative description of decisions made including how the IRP expects to maintain and protect the safety, reliable operation, and balancing of the utility's electric system.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (g) A narrative description of decisions made including how the IRP expects to achieve the requirements in WAC 480-100-610 (4) (c) including the long-term strategy and interim steps the utility will take to equitably distribute benefits and reduce burdens for highly impacted communities and vulnerable populations; and the estimated degree to which benefits will be equitably distributed and burdens reduced over the planning horizon.</p>	<p>Chapter 2, Clean Energy Action Plan</p>

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Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-100-620 (11) (h) A narrative description of decisions made including how the IRP expects to assess the environmental health impacts to highly impacted communities.</p>	<p>Appendix K, Economic, Health and Environmental Benefits Assessment of Current Conditions</p>
<p>WAC 480-100-620 (11) (i) A narrative description of decisions made including how the IRP expects to analyze and consider combinations of distributed energy resource costs, benefits, and operational characteristics to meet system needs.</p>	<p>Chapter 2, Clean Energy Action Plan Chapter 3, Resource Plan Decisions Chapter 5, Key Analytical Assumptions Chapter 8, Electric Analysis</p>
<p>WAC 480-100-620 (11) (j) A narrative description of decisions made including how the IRP expects to incorporate the social cost of greenhouse gas emissions as a cost adder.</p>	<p>Appendix G, Electric Analysis Models Chapter 5, Key Analytical Assumptions</p>
<p>WAC 480-100-620 (12) A ten-year clean energy action plan for implementing the clean energy standards at the lowest reasonable cost; informed by the utility's ten year cost-effective conservation potential assessment; identifies how the utility will meet the requirements in WAC 480-100-610 (4) (c); establishes a resource adequacy requirement; identifies cost-effective demand response and load management programs; identifies renewable resources, nonemitting electric generation and distributed energy resources; identifies any need to develop new, or to expand or upgrade existing, bulk transmission and distribution facilities; identifies the nature and possible extent to which the utility will rely on alternative compliance options; and incorporates the social cost of greenhouse gas emissions as a cost adder.</p>	<p>Chapter 2, Clean Energy Action Plan</p>
<p>WAC 480-100-620 (13) Include an analysis and summary of the avoided cost estimate for energy, capacity, transmission, distribution, and greenhouse gas emissions costs. Must list nonenergy costs and benefits addressed in the IRP and specify if they accrue to the utility, customers, participants, vulnerable populations, highly impacted communities or the general public.</p>	<p>Appendix H, Electric Analysis Inputs and Results Data input files are available on pse.com/irp and referenced in Appendix H.</p>
<p>WAC 480-100-620 (14) Data input files made available to the Commission in native format as an appendix to the IRP.</p>	<p>Appendix H, Electric Analysis Inputs and Results Data input files are available on pse.com/irp and referenced in Appendix H.</p>
<p>WAC 480-100-620 (15) Information and analysis that will be used to inform annual filings under Chapter 480-106 WAC related to qualifying facilities.</p>	<p>Appendix H, Electric Analysis Inputs and Results Data input files are available on pse.com/irp and referenced in Appendix H.</p>

B Legal Requirements



Statutory or Regulatory Requirement	Chapter and/or Appendix
WAC 480-100-620 (16) A summary of substantive changes to modeling methodologies or inputs that result in changes to the utility's resource need, as compared to the previous IRP.	Chapter 5, Key Analytical Assumptions
WAC 480-100-620 (17) A summary of public comments received during IRP development and utility responses.	Appendix A, Public Participation
WAC 480-100-625 (1) Timing. Unless otherwise ordered by the commission, each electric utility must file an IRP with the Commission by January 1, 2021, and every five years thereafter.	2021 Integrated Resource Plan Work Plan filed with the WUTC April, 2020, and Updated Work Plan filed May 15, 2020; July 8, 2020; September 17, 2020; October 26, 2020; and November 19, 2020.

*Figure B-4: Natural Gas Utility Integrated Resource Plan Regulatory Requirements
Codified in WAC 480-90-238*

Statutory or Regulatory Requirement	Chapter and/or Appendix
WAC 480-90-238 (3) (a) A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type and efficiency of natural gas end-uses.	Chapter 5, Key Analytical Assumptions Chapter 6, Demand Forecasts Appendix F, Demand Forecasting Models
WAC 480-90-238 (3) (b) An assessment of 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.	Chapter 9, Natural Gas Analysis Appendix I, Natural Gas Analysis Results Appendix E, Conservation Potential Assessment and Demand Response Assessment
WAC 480-90-238 (3) (c) An assessment of conventional and commercially available nonconventional gas supplies.	Chapter 9, Natural Gas Analysis Appendix I, Natural Gas Analysis Results
WAC 480-90-238 (3) (d) An assessment of opportunities for using company-owned or contracted storage.	Chapter 9, Natural Gas Analysis Appendix I, Natural Gas Analysis Results
WAC 480-90-238 (3) (e) An assessment of pipeline transmission capability and reliability and opportunities for additional pipeline transmission resources.	Chapter 9, Natural Gas Analysis Appendix I, Natural Gas Analysis Results

B Legal Requirements



Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>WAC 480-90-238 (3) (f) A comparative evaluation of the cost of natural gas purchasing strategies, storage options, delivery resources, and improvements in conservation using a consistent method to calculate cost-effectiveness.</p>	<p>Chapter 9, Natural Gas Analysis Appendix I, Natural Gas Analysis Results Appendix E, Conservation Potential Assessment and Demand Response Assessment</p>
<p>WAC 480-90-238 (3) (g) The integration of the demand forecasts and resource evaluations into a long-range (e.g., at least ten years; longer if appropriate to the life of the resources considered) integrated resource plan describing the mix of resources that is designated to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers.</p>	<p>Chapter 3, Resource Plan Decisions</p>
<p>WAC 480-90-238 (3) (h) A short-term plan outlining the specific actions to be taken by the utility in implementing the long-range integrated resource plan during the two years following submission.</p>	<p>Chapter 1, Executive Summary</p>
<p>WAC 480-90-238 (3) (i) A report on the utility's progress towards implementing the recommendations contained in its previously filed plan.</p>	<p>Appendix B, Legal Requirements</p>
<p>WAC 480-90-238 (4) Timing. Unless otherwise ordered by the commission, each natural gas utility must submit a plan within two years after the date on which the previous plan was filed with the commission. Not later than twelve months prior to the due date of a plan, the utility must provide a work plan for informal commission review. The work plan must outline the content of the integrated resource plan to be developed by the utility and the method for assessing potential resources.</p>	<p>2021 Integrated Resource Plan Work Plan filed with the WUTC April, 2020, and Updated Work Plan filed May 15, 2020, July 8, 2020, September 17, 2020, October 26, 2020 and November 19, 2020.</p>
<p>WAC 480-90-238 (5) Public participation. Consultations with commission staff and public participation are essential to the development of an effective plan. The work plan must outline the timing and extent of public participation. In addition, the commission will hear comment on the plan at a public hearing scheduled after the utility submits its plan for commission review.</p>	<p>Appendix A, Public Participation</p>

B Legal Requirements



Figure B-5: Additional Condition Pursuant to WUTC Order 01
in Dockets UE-160918 and UG-160919

Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>Order 5-7 (5) For the 2019 IRP, PSE will hire a firm to do a survey of resource costs and recommend assumptions for use in the IRP. If reasonable, PSE will have the same consultants provide information for both fossil fuel plants and renewables. That study will include a detailed discussion of potential wind resources off the Washington coast, including areas that may be geographically limited for different reasons.</p>	<p>Appendix D, Electric Resources and Alternatives – For the 2019 IRP, PSE hired DNVGL to develop resource costs. For the 2021 IRP, PSE relied on public information and incorporated stakeholder feedback before finalizing the resource costs and assumptions.</p>

Figure B-6: Natural Gas Utility Integrated Resource Plan
HB 1257 Regulatory Requirements

Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>RCW 80.28.380 Each gas company must identify and acquire all conservation measures that are available and cost-effective. Each company must establish an acquisition target every two years and must demonstrate that the target will result in the acquisition of all resources identified as available and cost-effective. The cost-effectiveness analysis required by this section must include the costs of greenhouse gas emissions established in RCW <u>80.28.395</u>. The targets must be based on a conservation potential assessment prepared by an independent third party and approved by the commission. Conservation targets must be approved by order by the commission. The initial conservation target must take effect by 2022.</p>	<p>Chapter 9, Natural Gas Analysis</p>

B Legal Requirements



Statutory or Regulatory Requirement	Chapter and/or Appendix
<p>RCW 80.28.405 For the purposes of section 11 of this act, the cost of greenhouse gas emissions resulting from the use of natural gas, including the effect of emissions occurring in the gathering, transmission, and distribution of natural gas to the end user is equal to the cost per metric ton of carbon dioxide emissions, using the two and one-half percent discount rate, listed in table 2, Technical Support Document: Technical update of the social cost of carbon for regulatory impact analysis under Executive Order 12866, published by the interagency working group on social cost of greenhouse gases of the United States government, August 2016. The commission must adjust the costs established in this section to reflect the effect of inflation.</p>	<p>Chapter 5, Key Assumptions Chapter 9, Natural Gas Analysis</p>



3. REPORT ON PREVIOUS ACTION PLANS

2017 Electric Action Plan

Per WAC 480-100-238 (3) (h), each item from the 2017 IRP electric resources action plan is listed below, along with the progress that has been made in implementing those recommendations.

Acquire Energy Efficiency

Develop two-year targets and implement programs that will put us on a path to achieve an additional 374 MW of energy efficiency by 2023 through program savings combined with savings from codes and standards.

PROGRESS: PSE collaborated with the Conservation Resource Advisory Group (CRAG) to develop the 2018-2019 total electric conservation program savings target of 59.41aMW and the 2020-21 program cycle savings target of 60.05 aMW.

Demand Response

Clarify the acquisition, prudence criteria and cost recovery process for demand response programs. Issue a demand response RFP based on those findings. Re-examine the peak capacity value of demand response programs in the 2019 IRP to include day-ahead demand response programs, and use the sub-hourly flexibility modeling capability developed in this IRP to value sub-hourly demand response programs.

PROGRESS: PSE is continuing to evaluate the best use cases for demand response (DR), including its potential as a non-wires alternative for transmission and distribution investments.

PSE filed a Demand Response RFP on May 4, 2020. The RFP called for demand response program offers to help meet capacity needs of 250 MW by 2026. The DR RFP solicited bids for both a system-wide electric demand response program, as well as smaller (3 to 5 MW, 3 to 5k MBH), geographically targeted electric and natural gas DR programs. Shortly before the WUTC was to rule on PSE's Draft All-Source and DR RFPs in mid-July 2020, PSE's updated load forecast indicated a significant reduction by 2026. Absent the originally forecasted capacity need in 2026, PSE petitioned for and was granted permission to withdraw both draft RFPs. The UTC granted the request on October 15, 2020, with the understanding that PSE will re-submit updated All-Source and DR RFPs by April 1, 2021. More information about the RFPs, including the latest schedule updates, can be found online at www.pse.com/rfp.



Energy Storage

Install a small-scale flow battery to gain experience with the operation of this energy storage system in anticipation of greater reliance on flow batteries in the future.

PROGRESS: PSE installed a Primus EnergyPod flow battery at the Wild Horse Wind Facility's operations and maintenance building in April 2018. Technology and performance issues resulted in less than satisfactory operation, however, this test provided PSE with opportunities to learn about the challenges associated with flow battery technology. Ultimately, the flow battery was removed from the site after a year of trial and errors due to poor performance and leak issues. Once the battery was removed from the site, project documents were archived and communications with the vendor ceased.

Supply-side Resources: Issue an All-source RFP

Issue an all-source RFP in the first quarter of 2018 that includes updated resource needs and avoided cost information.

PROGRESS: PSE filed an All-resource RFP on June 8, 2018, which was subsequently approved by the WUTC on June 28, 2018. The RFP called for resources sufficient to meet PSE's need for additional capacity and renewable resources beginning in 2022 and 2023, respectively. To date, PSE has announced three resource acquisitions from the 2018 RFP: (1) a long-term power purchase agreement that will be supplied by Golden Hills, a 200 MW wind farm to be built by Avangrid Renewables in Sherman County, Ore.; (2) a five-year agreement with the Bonneville Power Administration for up to 100 MW of surplus power generated from the Federal Columbia River Power System; and (3) a long-term agreement to purchase the excess energy generated after wood waste is burned at Sierra Pacific Industries' cogeneration plant located at its Burlington lumber mill in Skagit County, Wash. More information about these resources can be found online at www.pse.com/rfp in the 2018 Demand Response and All-Source RFP Update section.

The RFP process is ongoing. PSE will update the website if and when new resources are contracted.



Develop Options to Mitigate Risk of Market Reliance

Develop strategies to mitigate the risk of redirecting transmission and increasing market reliance.

PROGRESS: In the 2017 IRP, PSE included a plan to redirect transmission from the Lower Snake River and Hopkins Ridge wind farms to Mid-C in the winter peak months. This would have provided for a low-cost alternative to increasing the amount of peak capacity associated with transmission at Mid-C. In the 2017-2018 winter months, PSE was unsuccessful in redirecting the amount of planned transmission from the wind farms to Mid-C due to constraints on BPA's affected flowgates. For this reason, this strategy was abandoned.

The idea of maintaining quick-build options has been abandoned. The "shelf life" of project permits is too short to justify the expense of obtaining them for a project that is merely an option. A more viable resource strategy is to rely upon shorter, three to five-year term deals from identified resources while longer term resources are selected and developed.

PSE continues to participate in wholesale energy markets in the western U.S., including the western states power pool, in order to make bilateral transactions to cover its energy and capacity needs. PSE has also joined markets for energy imbalance services and is involved in the extended day-ahead market initiative with others in the region.

Further analysis is provided in this IRP and documented in Chapters 5, 7 and 8.

Energy Imbalance Market (EIM)

Continue to participate in the California Energy Imbalance Market for the benefit of our customers.

PROGRESS: Participation has resulted in enhanced system reliability, more cost effective integration of variable energy resources, geographic diversity of electricity demand and generation resources, and cost savings for PSE customers. Benefits can take the form of cost savings or revenues or a combination of both. Benefits include transfer revenues, which are the net of payments received or paid by PSE for the transfer of energy between EIM participants; dispatch benefits, which are the difference between PSE's cost to dispatch resources to meet load on its own and PSE's cost to dispatch resources according to EIM instructions; greenhouse gas (GHG) revenues, which are payments from CAISO to offset California GHG cost obligations; and flexible ramping revenues, which are payments for transfer of flexible ramping capacity between EIM participants.



Regional Transmission

Examine regional transmission needs in the 2019 IRP in light of efforts to reduce the region's carbon footprint.

PROGRESS: Since 2019, PSE has taken steps to evaluate several regional transmission strategies that would help to address the future needs of CETA. These steps include:

- Analysis of PSE's existing portfolio of Bonneville Power Administration (BPA) transmission for opportunities to repurpose, redirect and/or share transmission with co-located resources.
- Expanded resource modeling in the 2021 IRP to consider regional transmission constraints.
- Participating in strategic discussions with BPA and other utilities in the Seattle area about expanding transmission across the Cascades.
- Evaluating investments in new regional transmission projects.
- Collaborating with NorthernGrid on the 2020-2021 regional study proposal.

Transmission updates are further discussed in Appendix J.



2017 Natural Gas Sales Action Plan

Acquire Energy Efficiency

Develop two-year targets and implement programs to acquire conservation, using the IRP as a starting point for goal-setting. This includes 14 MDth per day of capacity by 2022 through program savings and savings from codes and standards.

PROGRESS: PSE collaborated with the Conservation Resource Advisory Group (CRAG) to develop the 2018-2019 total gas conservation program savings target of 650 MDth and 2020-21 program cycle savings target of 795 MDth.

LNG Peaking Plant

Complete the PSE LNG peaking project located near Tacoma.

PROGRESS: Construction of the facility is nearing completion. PSE will begin plant commissioning and testing of the Tacoma LNG plant in January 2021, and normal operations will likely begin by March 2021.

Option to Upgrade Swarr

Maintain the ability upgrade the Swarr propane-air injection system in Renton, which the [2017 IRP] plan forecasts will be needed by the 2024/25 heating season.

PROGRESS: The Swarr LP-Air facility is available for upgrade and the project can be upgraded on 2 years notice. Under the 2021 IRP Base Demand Forecast, the need for the upgrade is not currently forecasted to occur during the 2021 IRP study period.

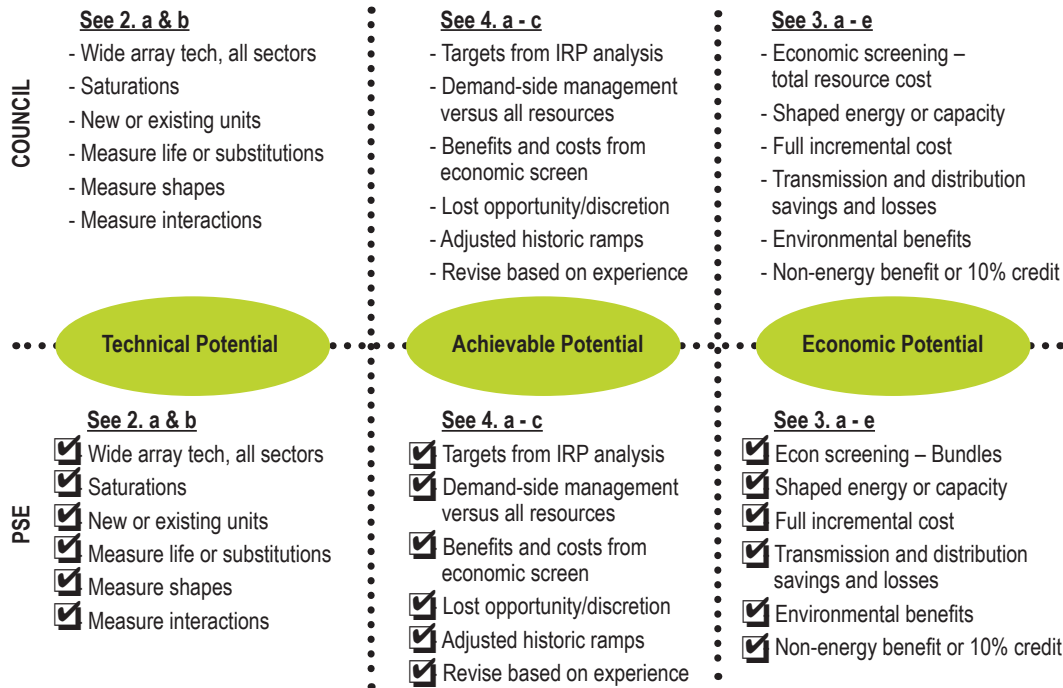


4. OTHER REPORTS

Electric Demand-side Resource Assessment: Consistency with Northwest Power and Conservation Council Methodology

There are no legal requirements for the IRP to address the Northwest Power and Conservation Council (Council) methodology for assessing electric demand-side resources. Such comparison, however, may be useful for PSE and stakeholders in implementing sections of WAC 480-109. PSE has worked closely with Council staff on several aspects of our analytical process, including approaches to modeling demand-side resources. We are most grateful for the dialogue, and very much appreciate the opportunity to work with Council staff. WAC 480-109 does not define “methodology.” PSE developed the detailed checklist below to demonstrate that our IRP process is consistent with the Council’s methodology.³

Figure B-6: Comparison of Demand-side Resource Assessment Methodologies, PSE and the Northwest Power and Conservation Council



3 / References in Figure B-4 refer to the Council’s assessment of its methodology, found at: <https://www.nwccouncil.org/media/112474/Methodology.pdf>



Department of Commerce Integrated Resource Plan Cover Sheet

The WUTC is required to provide summary information about the IRPs of investor-owned utilities to the Department of Commerce. Information for the cover sheet is included in Figure B-7, below.

Figure B-7: Load-resource Balance Summary

Resource Plan Year: 2022
 Base Year Start: 01/01/2022
 Base Year End: 12/31/2022
 Five-year Report Year: 2027
 Ten-year Report Year: 2032

Report Years Period Units	Base Year = 2022			2027			2032		
	Winter (MW)	Summer (MW)	Annual (aMW)	Winter (MW)	Summer (MW)	Annual (aMW)	Winter (MW)	Summer (MW)	Annual (aMW)
Loads	4,687	3,515	2,500	4,949	3,848	2,647	5,269	4,220	2,820
Exports	24	324	59	0	300	47	0	300	47
Resources									
Conservation/Efficiency	72	33	32	383	188	213	693	335	417
Demand Response	0	0		89	89		198	198	
Cogeneration									
Hydro	743	774	514	762	808	505	757	801	504
Wind	118	118	295	113	113	485	129	129	475
Solar	12	12	38	12	12	38	11	11	38
Biomass	16	16	14	16	16	14	16	16	14
Thermal - Gas	2,050	1,689	1,856	1,689	2,050	1,856	2,050	1,689	1,856
Thermal - Coal	307	307	247			0			0
Long Term: BPA Base Year or Tier 1									
Net Long Term Contracts: Other	612	612	534	63	63	107	44	44	45
Net Short Term Contracts	1,518	1,487		1,479	1,433		1,479	1,435	
Other									
Imports	303	303	50	303	303	50	303	303	50
Total Resources	5,727	5,027	3,521	4,911	4,776	3,221	5,681	4,661	3,352
Load Resource Balance (Surplus) / Deficit	(1,039)	(1,512)	(1,020)	38	(928)	(574)	(412)	(442)	(532)