EXH. ZCY-3HC
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: ZACARIAS C. YANEZ

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

SECOND EXHIBIT (HIGHLY CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

ZACARIAS C. YANEZ

ON BEHALF OF PUGET SOUND ENERGY

REDACTED VERSION

FEBRUARY 15, 2024

Chelan Contract Renewal

Execution Request

Ron Roberts

Vice President Energy Supply

January 2022

PUGET SOUND ENERGY

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Confidential per WAC 480-07-160

Request authorization to execute a 20-year power purchase agreement with Chelan PUD

Based on resource needs, economic analysis, and consideration of risks and benefits, management requests that the board of directors authorize PSE to execute the 20-year contract renewal with Public Utility District #1 of Chelan County ("Chelan PUD").

Summary of Key Terms:

Term: Nov 2031 – Oct 2051

Product: 25% "Slice", or share, of Chelan's Rocky Reach and Rock Island hydroelectric projects:

- ~ 444 MW Capacity; and
- Over 2,000 GWh of Clean (CETA) Energy.

Price: PSE will be responsible for 25% share of the projects' cost of production + a fixed annual adder. Based on forecasted production and costs result in estimated per MWh costs of:

- $[redacted]/MWh – Levelized total costs
  - $[redacted]/MWh – Levelized cost of production
  - $[redacted]/MWh – Levelized fixed annual adder

[redacted]

Chelan's hydro projects have been a central part of PSE supply portfolio since their creation

- PSE's interest in the Rock Island and Rocky Reach hydro projects ("the Projects") began when they first entered service in 1933 and 1961, respectively. Prior to the existing contract, which was executed in 2006, PSE had as much as 43% share (830 MW) of the Projects output.
- Existing contract summary:

  Term – The existing contract took effect in 2011 and 2012. Contract will expire in October 2031, with **no right of first refusal or roll-over rights**.

  Product – 25% slice of the Projects output, or ~444 MW of nameplate capacity and over 2,000 GWhs of energy per year.

  Price – A one-time initial reservation payment of $[redacted] and 25% of the on-going production costs.

  Environmental Attributes - In August 2022, PSE and Chelan amended the PSA so that PSE would now receive the environmental attributes associated with the projects

- In 2021, Chelan began contract renewal discussions with PSE
  - Chelan and Avista agreed to a similar contract in December 2021 (5% slice growing to 10%).
  - In spite of recent shifts in NW energy markets, Chelan has maintained consistent terms and has not materially change the price (~$[redacted]/MWh) originally proposed in Aug 2021. [redacted]

New contract terms are mostly consistent with existing contract.

This list summarizes key changes.

Pricing terms consistent with current contract with two exceptions:

- Fixed annual price adder, please see table in appendix slide.
- Transmission payment tied to published OATT rate.

Transmission Service is now based on Chelan's OATT.

Chelan has placed a 4,350 limit on the number of physical unit starts PSE may cause in a rolling 24-month period.

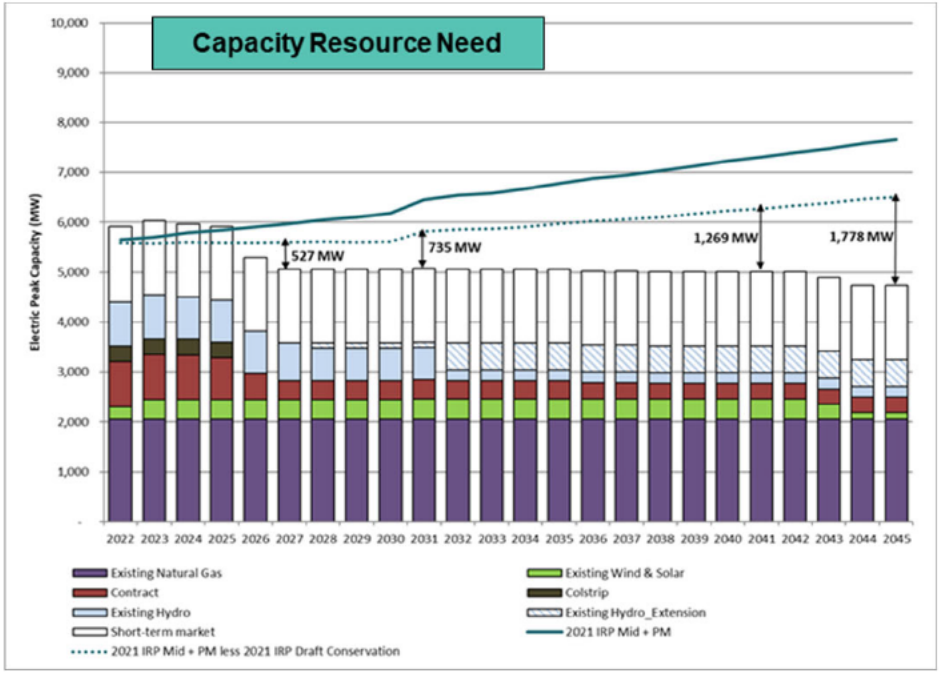
- The physical start limit is based on the mechanical limits of the generating units, does not appear to be overly restrictive based on historic observation.

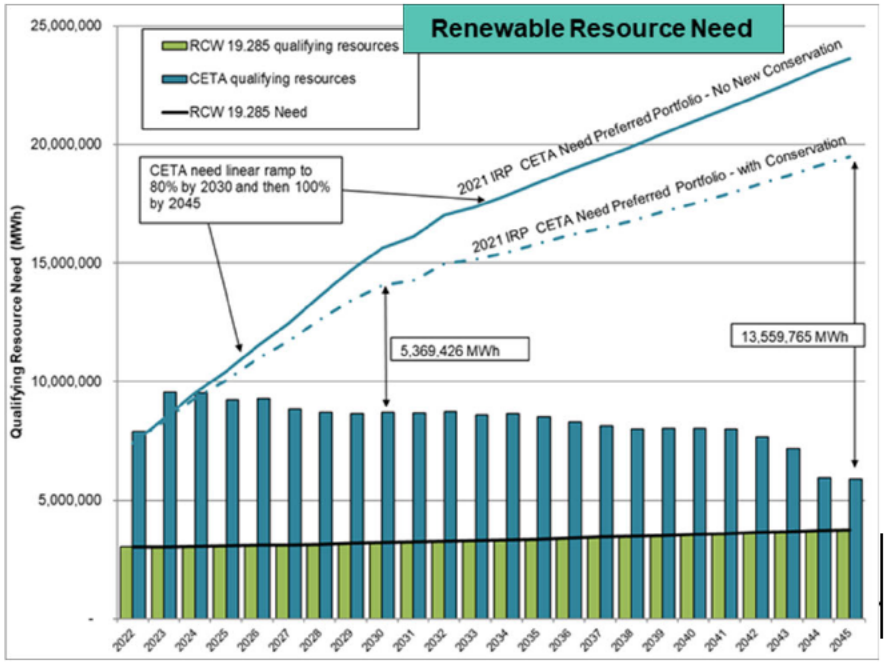
As discussed in the risk section and the appendix slides, Chelan is requesting credit and performance support.

[redacted]

Growing need for capacity and renewable resources reinforce the importance of Chelan Contract Renewal to PSE

- PSE's 2021 IRP showed a substantial resource need despite assuming the Chelan contract would be renewed.
- PSE is currently finalizing the 2023 IRP progress report, preliminary indications are the capacity and renewable needs are increasing.
- Renewing the Chelan contract secures 444 MW of capacity and over 2,000 GWH of renewable energy through October 2052.





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Renewing the Chelan contract is lower cost relative to comparable portfolios and provide qualitative benefits

Resource Alternatives	NPV Costs (2022 $000)	Levelized $/MWh
Chelan renewal	[redacted]	[redacted]
2021 RFP Phase 2 AURORA incremental costs		
Revenue requirement model – AURORA replacement		
Revenue requirement model – wind and peaker replacement		

In addition to substantial costs savings the Chelan contract includes other benefits such as:

- Access to a 25% of the pondage behind the projects.
- The ability to dynamically schedule output, allowing the access to full flexibility of project.
- Historically used to carry operating reserves and helps balance and integrate variable energy resources.
- Commercially available project with a long operating history and a proven transmission solution.
- Projects have gone through major turbine modernization, Rock Island Powerhouse 2 expected to be completed in 2023.

[redacted]

PSE's bottoms up valuation and RFP comparison based on component pricing

Alternative comparisons based on the cumulative values of certain output components:

- forecasted energy;
- environmental attributes; and
- capacity prices.

Scenario One - Uses a forecast of 2032 forward market prices from August 2022, and capacity and environmental attributes as described in the Collateral Annex to the contract.

Scenario Two – Uses the energy value on the IRP mid energy price forecast, capacity value is based on $20/MWh adder which is equal to about $93 per MW-year, and the environmental adder is based on the Washington Department of Ecology's Climate Commitment Act "Floor" forecasts.

Scenario Three – Calculates the average energy and capacity values from the 2021 RFP short-list resources presented to PSE's Energy Management Committee in November of 2022. Note in this scenario, because all of the energy resources included in RFP shortlist are renewable resources, the energy costs include the associated environmental attributes.

[redacted]

PSE's bottoms up valuation and RFP comparison based on component pricing (Continued)

Scenario	Energy ($/MWh)	Capacity ($/MWh)	Environmental Attributes ($MWh)	Total ($/MWh)
Scenario One: Forecasted forward prices	$ 56	[redacted]		
Scenario Two: IRP energy prices	$ 43	$ 20	$ 14	$ 77
Scenario Three: 2021 RFP November Shortlist prices	$ 54	$ 23	$ 0	$ 77

Scenario Three may not be a direct comparison due to difference in timing of resources. Additionally, it is important to note that these resources were selected to meet the RFP needs, meaning they would not be available to replace the Projects output. Given these limitations the analysis allows a comparison of the value of the project relative to known market options at the time of the decision. [redacted]

PSE and Chelan PUD interests align to mitigate relicensing and operational risks.

Relicensing risk - Rock Island license expires in 2028.

- Chelan PUD has started studies and will submit relicense application with FERC no later than December 2025.
- [redacted] Review by PSE subject matter experts gives confidence that Chelan has a good team working on solutions. Expected to be a continuation of current license with seismic improvements, fishery mitigations, and recreational improvements.

Operational and cost risk

- PSE's share of project costs is equal to PSE's current share of output, 25%.
- Chelan will retain up to 65% of the projects for load service or to market to third parties.
- It is in Chelan's best interest to maintain efficient and reliable output to control cost and minimize rate impacts for their own customers.

[redacted]

Appendix

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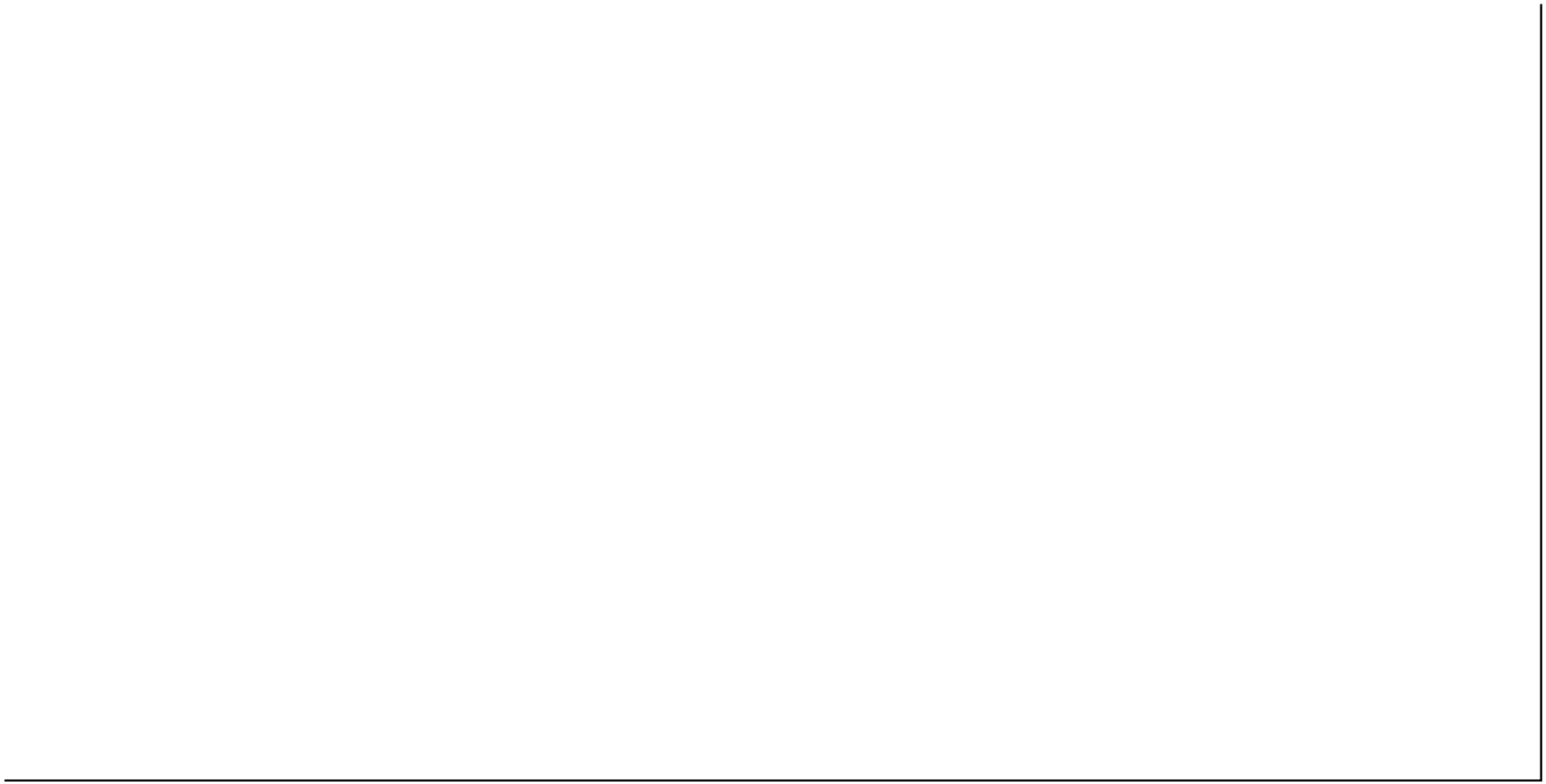
PSE's 25% share of Chelan's fixed annual charge

Year	PSE's 25% share	Year	PSE's 25% share
2031 $		2041 $	
2032 $		2042 $	
2033 $		2043 $	
2034 $		2044 $	
2035 $		2045 $	
2036 $		2046 $	
2037 $		2047 $	
2038 $		2048 $	
2039 $		2049 $	
2040 $		2050 $	
		2051 $	

[redacted]



Power Sales Agreement

between

Puget Sound Energy, Inc.

and

Public Utility District No. 1 of Chelan County, Washington

Rocky Reach and Rock Island Hydroelectric Projects

(November 1, 2031 – October 31, 2052)

Report to the Board of Directors

PSE PUGET SOUND ENERGY

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1. Executive Summary

Puget Sound Energy, Inc. ("PSE") seeks authorization from the Board of Directors to enter into a 20-year power sales agreement ("Chelan PSA" or the "PSA") with Public Utility District No. 1 of Chelan County, Washington ("Chelan PUD" or the "District"). The PSA will allow PSE to continue to purchase a 25% share of output from the Rock Island and Rocky Reach hydroelectric projects ("the Projects") at a forecasted levelized price of $____/MWh for a term commencing November 1, 2031, and expiring on October 31, 2051, all in accordance with the resolutions set forth in Attachment 1. PSE forecasts the Projects to provide 444 MW of capacity and 2,166 GWh of zero emission energy and to continue to provide a flexible resource to help integrate current and future renewable resources. Chelan PUD will continue delivering energy to PSE's system under the terms of the PSA.

Chelan PUD approached PSE in the first quarter of 2021 for the purpose of renewing the existing power sales agreement that is scheduled to expire in October 2031. PSE's decision to negotiate and enter into the PSA about eight years ahead of the expiration of the existing agreement is driven by the importance of the Projects to PSE's portfolio. Output from the Projects has for decades been the backbone of PSE's existing resource base, providing seasonal and daily load shaping energy and capacity benefits in addition to necessary ancillary services. This output helps to ensure PSE's ability to meet clean energy needs, daily and seasonal peaking requirements, integrate existing and incremental wind or other variable production resources into the Company's supply portfolio, and provides increased certainty related to modeling and determination of PSE's future resource needs and supply alternatives.

Given these important attributes and PSE's extensive electric supply resource needs, PSE has understood for some time that continued access to the Projects' output would be a critical component of PSE's long-term electric portfolio management strategy. However, PSE's existing long-term contract with Chelan PUD does not contain provisions for any right of first refusal, right of first offer or extension beyond their current terms. When Chelan PUD informed PSE of its desire to reach an agreement in principle by the end of 2022, PSE saw an opportunity to undertake negotiations with Chelan PUD and secure access to the Projects output through November 2051. Securing the capacity, clean energy, and ancillary benefits through the 2045 transition to 100% clean energy Washington targets.

2. Counterparty and Product

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Counterparty

General Description

Chelan PUD is a public utility district formed in 1936 under Title 54 of the Revised Codes of Washington and headquartered in Wenatchee, Washington. The District began serving retail electric customers in 1947. In 2021, the District served approximately 49,900 electric retail customers and provided water, sewer, and wholesale telecommunications services in its service area.

The District owns and operates the Projects, two large hydroelectric projects on the Columbia River, and the Lake Chelan hydroelectric project, a third project located on Lake Chelan. Chelan PUD has extensive experience owning, operating, maintaining, and licensing hydroelectric projects located in Washington.

Current PSE Experience

Currently, PSE purchases thirty percent (30%) of the output of the Projects under the terms and conditions of the following agreements between PSE and Chelan PUD:

2006 Power Sales Agreement – Under PSE's existing long-term contract with Chelan PUD, the company is entitled to 25% share of the output of the Projects. Under the terms of the contract PSE paid a one-time reservation charge of $ million in 2006 and pays for 25% share of the Projects costs on an annual basis. The PSA was executed on February 3rd, 2006 and is in effect until October 2031. In 2022 PSE and Chelan PUD executed the First Amendment to Power Sales Agreement. Under the terms of this amendment, PSE and Chelan agreed on the shared value for the environmental attributes and PSE will be able to claim its 25% share of the generated environmental attributes of the Projects from 2022 through the term of the agreement.

Slice 35 Agreement – PSE executed a separate slice contract, Slice 35, with Chelan PUD in 2021. This contract entitles PSE to an additional 5% share of the Projects' output from January 1, 2022 through December 31, 2026. Under the terms of the contract PSE has access to 5% of the output, including the associated energy, capacity, environmental attributes and ancillary services for a fixed annual payment of $

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Summary of key contract terms

The project is expected to achieve commercial operation by June 30, 2022. Key PSA terms are summarized below:

- **Parties:** Public Utility District No. 1 of Chelan County
- **Product:** Contract entitles PSE a 25% share or slice of the output of the Projects. This is the equivalent of about 444 MW of capacity and 2,166 GWh of non-emitting energy. Actual output will be adjusted based on hydrological conditions and operating constraints as determined by Chelan PUD. PSE can use a dynamic schedule which will allow the Company to realize many ancillary benefits (such as load following, regulation and reserves). A full list of the Projects' output can be found in attachment 5.
    - PSE will receive all environmental attributes generated by the Projects.
- **Contract Term –** The term is 20 years, starting on November 1, 2031 (after the expiration of the existing 2006 Power Sales Agreement) and expiring on October 31, 2051.
- **Point of interconnection ("POI"):** The Projects interconnect to the Chelan Transmission System. Chelan PUD will deliver PSE's share of the output from the Projects to one of the Points of Delivery ("POD") identified below.
- **Transmission:** Article 9 of the PSA provides firm transmission service on the Chelan Transmission Service to any of the PODs listed below. PSE will use existing rights to transmission capacity on the Federal Columbia River Transmission System pursuant to service agreements with Bonneville Power Administration ("BPA") for Long-Term Firm Point-To-Point Transmission Service to deliver the output from the PODs to PSE's system.
- **Point of delivery ("POD"):** Chelan PUD will deliver output from the Projects to one or more of the following PODs:
    - Cascade (formerly White River) – Rocky Reach 230 kV Transmission Line (interconnection between Chelan PUD and PSE)
    - Maple Valley – Rocky Reach 230/345 kV Transmission Line (interconnection between Chelan PUD and BPA)
    - Rocky Reach – Columbia #2 230 kV Transmission Line (interconnection between Chelan PUD and BPA)

- Chelan Rocky Reach – Columbia #2 230 kV Transmission Line (interconnection between Chelan PUD and Public Utility District No. 1 of Grant County, Washington)
- Rocky Reach – Columbia #1 230 kV Transmission Line (interconnection between Chelan PUD and BPA)
- Rocky Reach – Douglas 230 kV Tie Line (interconnection between Chelan PUD and Douglas Public Utility District No. 1 of Grant County, Washington)
- Valhalla Substation (Rock Island) (interconnection between Chelan PUD and BPA)
- At any other location mutually agreed to by the District and Purchaser

- **Contract Price:** The energy generated from the Projects is forecasted to have a levelized cost of [redacted]/MWh delivered at any of the POD listed above. The contract has four major pricing components, PSE will pay a 25% share, consistent with its share of output. The pricing components are described below and are further detailed in Attachment 3.
  - Net Cost – PSE will pay a 25% share of the costs to own, operate, maintain, repair, and improve the Chelan Power System. These costs include but are not limited to:
    - All direct and indirect operating and maintenance costs may be attributed to the Chelan Power System or any part thereof.
    - Financing Costs in connection with the issuance, incurring and carrying of Debt Obligations payable or deemed payable by the District or the Chelan Power System.
  - Transmission Charges as defined in the District's OATT.
  - Fixed Annual Payment, one twelfth of the fixed annual payment as specified in the contract.
  - Other Costs such as Capital Recovery, Coverage Fund, Debt Reduction, and Working capital charges.

For a detailed summary of material PSA terms, see Attachment 3.

SECTION 2. COUNTERPARTY AND PRODUCT

Credit Assessment

Chelan PUD is a customer-owned public utility district organized under Title 54 of the Revised Costs of Washington. Moody's Investors Service recently upgraded ratings for the Chelan County Public Utility District consolidated system revenue bonds and Rock Island Hydroelectric project revenue bonds to Aa2 from Aa3 with a Stable outlook. Chelan PUD also continues to maintain AA+ ratings from both Standard & Poor's and Fitch Ratings, which places it among the few Aa2/AA+ rated utilities in the nation.

3. Descriptions of the Projects

General description of facility and footprint

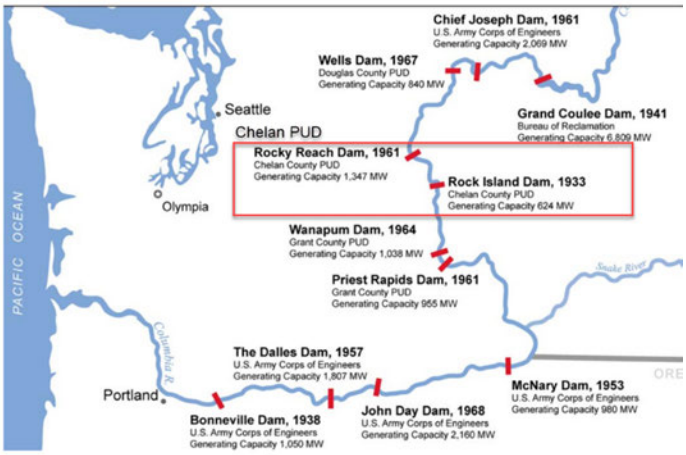


Figure 1: Location of Chelan PUD Hydroelectric Dam Projects

Project description

Chelan Public Utility District owns and operates three hydroelectric projects, all located in Chelan County. The three hydroelectric projects, Rocky Reach, Rock Island, and Lake Chelan, together, have capacity to generate nearly 2,000 MW of power. Of the three hydroelectric projects, the two projects located on the Columbia River, the Rocky Reach and Rock Island Projects, have existing agreements to supply power with PSE.

Rocky Reach Project

Figure 2: Rocky Reach Hydroelectric Project

Rocky Reach Project (FERC Project No. 2145) was developed over a period of about 15 years. Construction of the dam and original powerhouse with seven generating units began in 1956 for the purpose of power production and flood control. The addition of four more units began in 1969 after ratification of the Columbia River Treaty between the United States and Canada. The additional units were installed primarily to make use of stored water released from reservoirs in Canada and the Libby Dam reservoir in Montana.

The project went into commercial operation in 1961 with an initial 7 generators, with 4 additional generators added between 1969 and 1971. Total nameplate capacity of Rocky Reach Project is 1300 MW. The dam consists of a non-overflow west forebay wall section; a powerhouse containing 11 vertical shaft integrated Kaplan turbine/generator units; a non-overflow center dam section; a gated spillway section; and a non-overflow east abutment section.

Rock Island Project

The Rock Island Project (FERC Project No. 943) development of the dam, first powerhouse, and four operating units began in 1930 and completed in 1933, making it the first dam to span the Columbia River. The addition of 6 units was completed in 1953. Located on the west bank of the river, a second powerhouse with 8 bulb turbine generators was placed into operation in 1979.

Figure 3: Rock Island Hydroelectric Project

Powerhouse 1 of the Rock Island Project completed construction in 1930 and is an 870-foot long. The concrete powerhouse is integral with the dam and contains 1 station service unit and 10 vertical-shaft generating units. The station service unit is rated at 1,230 kilowatts and all four of the original generators have been rewound. One generator retains its original nameplate rating of 15,000 kilowatts. The other three were upgraded and each have a nameplate rating of 20,700 kilowatts. The six additional generators are each rated at 22,500 kilowatts. Units B1-B4 have Nagler-type propellers, B5-B10 have Kaplan-type propellers.

Powerhouse 2 of the Rock Island Project completed construction in 1979 and is 465-foot long concrete powerhouse containing 8 horizontal shaft, bulb-turbine type generation units. They were the first installed in the United States and were the largest in the world when installed between 1974-79. The generators are encased in watertight steel shells. Each submarine-like bulb is located within a draft tube (water passage). Each generator has a nameplate rating of 51,300 kilowatts, bringing the nameplate capacity of the eight units to 410,400 kilowatts.

The total nameplate rating of both powerhouses is 623,725 kilowatts.

Rocky Reach Project Boundary

The Rocky Reach Project Boundary contains approximately 1,500 acres of land. Federal agencies open approximately 135 acres within the Rocky Reach Project Boundary. Chelan PUD owns approximately 724 acres within the Rocky Reach Project Boundary and has flowage easements for the remainder of the lands. There are no tribal lands within the Rocky Reach Project Boundary. All facilities of the Rocky Reach Project, including the dam, the powerhouse, the reservoir, fish passage and rearing facilities, and the seven recreation facilities, are located within the Rocky Reach Project Boundary. The Rocky Reach Project

reservoir extends approximately 43 miles upstream from the Rocky Reach Dam to the Wells Project (FERC No. 2149) owned and operated by Public Utility District No. 1 of Douglas County, Washington. The Rocky Reach Project Boundary encloses the reservoir and the tailrace below the Rocky Reach dam and includes designated recreational sites

Rock Island Project Boundary

The Rock Island Project Boundary encompasses an area of approximately 4,944 acres from the Rock Island Dam to just below the Rocky Reach Project. The Rock Island Project Boundary straddles the county line between Douglas and Chelan Counties. Chelan PUD owns the dam and associated powerhouses, together with appurtenant facilities, recreation facilities along the Rock Island Project reservoir, and property interests in lands within the Rock Island Project Boundary.

Transmission

Power from the Rocky Reach Project is delivered to the District's system at 115 kV. Other 230-kV transmission lines deliver energy to the Rocky Reach Project's power purchasers. Power also flows into the regional transmission grid of BPA.

For the Rock Island Project, step-up transformers at the Powerhouse 2 connect to two single-circuit 115 kV transmission lines, extending approximately 2 miles to the McKenzie-Valhalla substation. Power also flows into the regional transmission grid of BPA.

Operations

The Projects are two of the seven hydroelectric projects located on the middle section of the Columbia River, commonly referred to as the Mid-Columbia or Mid-C. Of these hydroelectric projects, only the Grand Coulee Project has significant storage. Chelan PUD manages operations for fish passage and water quality objectives pursuant to the terms and conditions of the FERC license for each Project and associated agreements. Operations schedules are highly influenced by operations at upstream hydroelectric projects, such as the Chief Joseph, Grand Coulee, and Wells Projects, and information provided by operators at these upstream projects. Project operations include activities to ensure successful operation of fish passage measures.

Storage at both Projects are minimal relative to the flows on the Columbia River and do not provide for significant regulation of flows. These run-of-river projects, on average, have inflows that approximately equal their outflows during both normal and abnormal inflow conditions. Under low flow conditions, the District takes generators off-line based upon flow availability, with fish spill allocations prioritized. Chelan PUD operates the Rocky Reach Project reservoir with a normal maximum headwater elevation of 707 feet NGVD and minimum headwater elevation of 703 feet NGVD. The District operates the Rock Island Project with a normal maximum headwater elevation of 613 NGVD and a minimum headwater elevation of 609 feet. Flows that exceed generation and fishway releases pass through the spillways.

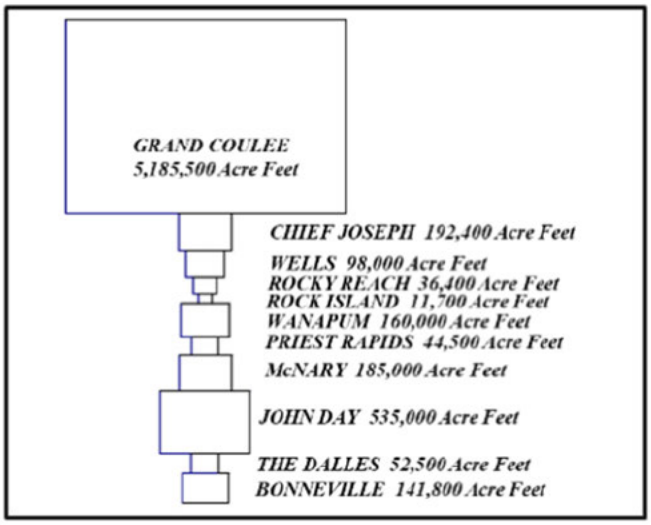


Figure 4: Columbia River Usable Storage in Acre Feet

Chelan PUD is "long" in terms of its resource position throughout an IRP planning period that extends to 2030. The District has a comprehensive forward hedging strategy and pursues the sale of market-based products, such as slice contracts (i.e., a percentage share of project capacity and energy), block sales (i.e., a predetermined quantity of energy), and/or other products approved by the District's internal Power Risk Management Committee

Typically, the District uses a stair-stepped approach to manage wholesale revenue risk and stabilize revenue at least five years into the future, with more risk hedged in the near-term years and less risk hedged in outer-term years. For purposes of example, Chelan PUD had, as of mid-2021, hedges executed for as far out as 2033.

- **Rocky Reach Project** – Chelan PUD's share (net of long-term purchaser contracts and executed slice contracts):
    - 18.46% - 1/2021 through 12/2022
    - 23.46% - 1/2023 through 1/2025
    - 28.46% - 2/2025 through 12/2026
    - 33.46% - 1/2027 through 10/2028
    - 59.46% - 11/2028 through 12/2030

- **Rock Island Project** – Chelan PUD's share (net of long-term purchaser contracts and executed slice contracts):
    - 24% - 1/2021 through 12/2022
    - 29% - 1/2023 through 1/2025
    - 34% - 2/2025 through 12/2026
    - 39% - 1/2027 through 10/2028
    - 65% - 11/2028 through 12/2030

Chelan PUD currently has long-term power sales agreements with PSE; Public Utility District No. 1 of Douglas County, Washington ("Douglas PUD"); Alcoa Power Generating Inc. & Alcoa Inc.; and Avista Corporation.

- **Rocky Reach Project Long-Term Power Sales Agreements**
    - Alcoa - 26% of the output of the Rocky Reach Project through 2028[1]
    - Avista – 5% of the output of the Rocky Reach Project for the 2026 – 2030 period
      10% of the output of the Rocky Reach Project for the 2031 – 2045 period
    - Douglas PUD – 5.54% of the output of the Rocky Reach Project through 2030
    - PSE - 25% of the output of the Rocky Reach Project through 2031
- **Rock Island Project Long-Term Power Sales Agreements**
    - Alcoa - 26% of the output of the Rock Island Project through 2028[1]
    - Avista – 5% of the output of the Rock Island Project for 2026 – 2030
      10% of the output of the Rock Island Project for 2031 – 2045
    - PSE - 25% of the output of the Rock Island Project through 2031

[1] In December 2021, Alcoa Corporation announced that the Wenatchee Works smelting facility will be permanently decommissioned. Closure of the plant does not impact the contract terms of the power sales agreement, which remains in effect until expiration in 2028

- **"Slice of the System" Contracts**

    - Chelan PUD has also entered into "slice of the system" contracts as part of its long-term hedging strategy. Slice contracts represent between 10% and 25% of the capacity and energy from the District's share of the output of the Projects.

    - PSE – Five-year, fixed-price "slice" contract for 5% of the output from the Projects from 2022 through 2026.

    - Avista – Ten-year, fixed-price "slice" contract for 5% of the output from the Projects from 2024 through 2033.

Hydro Project Upgrades

In September 2013, three large generating units at the Rocky Reach Project were taken out of service after discovering that the fourth large turbine (out of service since March 2013) had a deep crack in a stainless steel rod that delivers oil to a servo motor, which adjusts the angle of the turbine blades. The four units share the same design and were placed into service between 1998 and 2002. After making interim repairs, including temporarily fixing the blade positions, all four units were back online in early 2014. Beginning in 2015, the units were taken out of service, one at a time, to make more permanent repairs. All servo rod repairs have been completed on units C8 and C9 along with governor upgrades. Units C10 and C11 are now scheduled to be repaired in the 2022-2024 timeframe. The remaining seven smaller units at the Rocky Reach Project do not share the same design in regards to either of these issues.

The seven smaller generating units at Rocky Reach were all in need of trunnion bushing replacement. The turbine bushings for units C1 and C2 were replaced, and the units returned to service in January 2020 and December 2020, respectively. The turbine bushings for unit C7 were replaced, and that unit returned to service in 2021. Units C3 and C6 are currently out of service and undergoing the same repairs. Units C4 and C5 are all in service and scheduled for their replacements in the 2021-2022 timeframe. The schedule is dependent on the repairs being completed within 7 months per unit. Due to COVID-19 supply chain issues, the recent turbine repairs took 11 months to complete. The District has made several equipment purchases in advance to minimize future delays due to material unavailability. There remains, however, the potential discovery of other previously unknown problems requiring the replacement of turbine components resulting in longer outage durations.

During generator stator replacement work for unit B2 at the Rock Island Project, fatigue cracks were observed on the blades of the turbine. From October 2015 through January 2016, District staff made repeated attempts to grind out the cracks and repair the resulting excavations with various welding procedures. After each repair procedure, inspections resulted in the observation of new fatigue cracks. Engineering analysis indicated the unit B2

turbine is experiencing a phenomenon known as corrosion fatigue. The turbines of units B1, B3 and B4 are of similar design and vintage as the turbine of unit B2. The District took units B1, B3 and B4 out of service for inspection to determine if similar cracking existed in their turbine runner blades. These turbines also had significant cracking due to corrosion fatigue. All four turbines (units B1, B2, B3, and B4) will remain out of service until the District can install replacement turbine runners. The District completed the development of specifications for the procurement of turbine runners for B1 through B4 and awarded a construction contract in late 2016. Repairs and replacement on unit B4 were completed in August 2021. The remaining three units (units B1 through B3) will follow in 2022 through 2024.

Chelan PUD initiated a series of sequential outages in January 2007 to modernize units B5 through B10. The scope of work for the modernization contract included the replacement of turbine runners, governor systems, generator stators and rotor poles and control systems. By May 2017, the contractor selected for this work had completed work on units B10, B9, and B6. In June of 2017, unit B9 suffered a Kaplan pipe failure and remained out of service until repairs were complete on October 3, 2018. In June 2019, unit B10 was removed from service to perform an overhaul and conduct turbine inspections. During the inspection, Chelan PUD discovered a few internal turbine components had failed or were near failure.

Subsequent inspections on unit B9 and B6 yielded similar observations of failed internal turbine components as unit B10. It was determined that it was safe to run the units in this condition until the final repair could be made so units B6 and B9 are currently “in service”. The modernization contractor conducted a root cause analysis of these failures and reviewed their findings with Chelan PUD in August 2019. Four repairs were identified to restore units B6, B9 and B10. Since the remaining units in the modernization project (units B5, B7, and B8) are of similar design, the repairs identified above will be performed during the modernization outage. The repairs were completed on unit B10, and the unit returned to service in April 2021 followed by unit B7, which returned to service in December 2021. Modernization and turbine repairs on units B5, B6, B8, and B9 are ongoing through the remainder of this year.

Licensing History

Rocky Reach Project

Chelan PUD’s original license for the Rocky Reach project was issued in 1957, and expired on June 30, 2006. On June 29, 2004, the District filed an application for a new license for the continued operation and maintenance of the Rocky Reach Hydroelectric Project No. 2145. The District prepared the new license application pursuant to the FERC alternative licensing process. The project’s installed capacity under this license is 865.76 megawatts (MW).

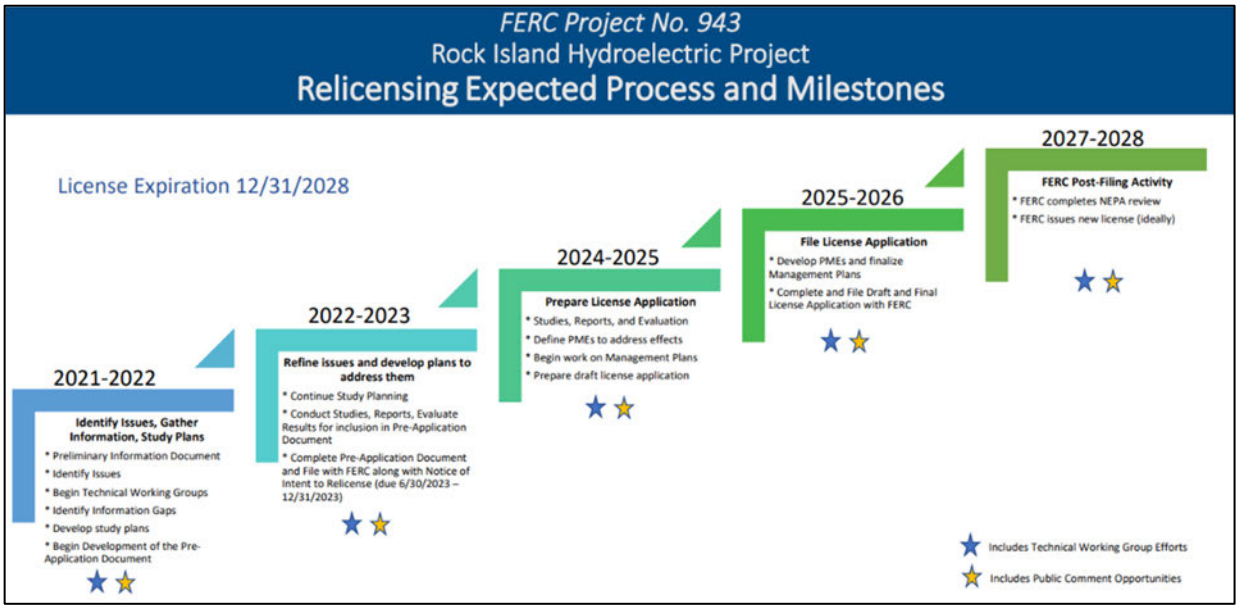
On February 19, 2009, FERC issued a license for the Rocky Reach Project for a period of 43 years, effective the first day of the month in which the license is issued, to operate and maintain the Rocky Reach Project No. 2145.

Rock Island Project

Chelan PUD has an existing license for the Rock Island Project that expires December 31, 2028. The next license will be the third license for the Rock Island Project. Obtaining a new operating license will require the District to complete a multi-year application process and file a final license application on or before December 31, 2026.

The official relicensing process will begin when the District files a Notice of Intent and Pre-Application Document (PAD) no later than December 31, 2023. Chelan PUD will use the Integrated Licensing Process (ILP) in the Rock Island Project relicensing. In late 2021, Chelan PUD initiated an early and voluntary stakeholder engagement process in support of the Rock Island Project relicensing process.

Figure 5. ***Rock Island Project Re-licensing Process and Milestones***



4. Determination of Need

PSE's integrated resource planning analysis, which evaluates and establishes capacity and renewable resource needs on a biennial basis, guides the electric resource acquisition process.

PSE's 2021 Integrated Resource Plan (the "2021 IRP") and the 2021 Clean Energy Implementation Plan (the "2021 CEIP") address the changes necessary to achieve the goals of CETA and reflect the following:

- Significant investments in renewable resources (hydro being a qualifying resource);
- Accelerated acquisition of energy conservation;
- Increased use of demand response;
- Integration of distributed energy resources like residential solar and battery energy storage;
- Reduced reliance on short-term market purchases in response to the changing western energy market;
- Inclusion of alternative fuels to operate new generating plants; and
- An assumption that PSE will continue to rely on its existing portfolio of hydroelectric generation.

Figures 6 and 7 below depict the resource needs identified in the 2021 IRP. Although resource need has been updated as part of the 2021 CEIP and the 2021 Request for Proposal (the "2021 RFP") processes, those processes focused primarily on needs in the first CEIP compliance window (2022-2025) and in the 2021 RFP window (through 2027). PSE did not evaluate the PSA as part of the 2021 RFP because the delivery term starts well outside the decision window for the 2021 RFP.

As illustrated in Figure 6 below, PSE expects to have a significant capacity need in 2031 and beyond. Notably, this significant capacity need assumes that PSE would continue to purchase 25 % of the output of the Projects. Failure to acquire 25% of the output of the Projects would effectively increase PSE's capacity need from 735 MW to about 1,179 MW (735 MW + 444 MW to reflect the expiration of the Chelan contract) in 2031. Furthermore, preliminary results of the 2023 IRP Progress Report indicate that PSE's capacity need is increasing.

Figure 6. ***Capacity Resource Need***

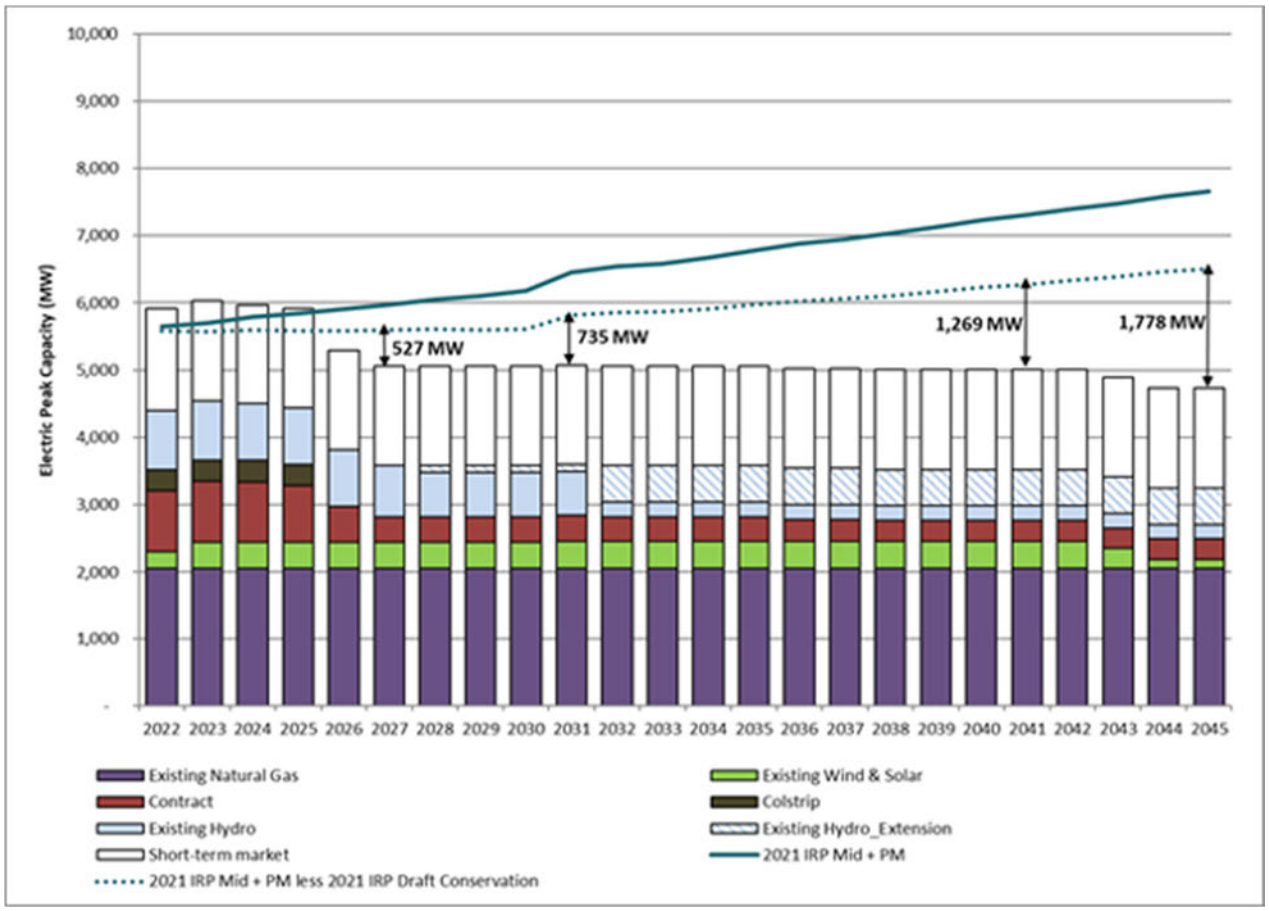
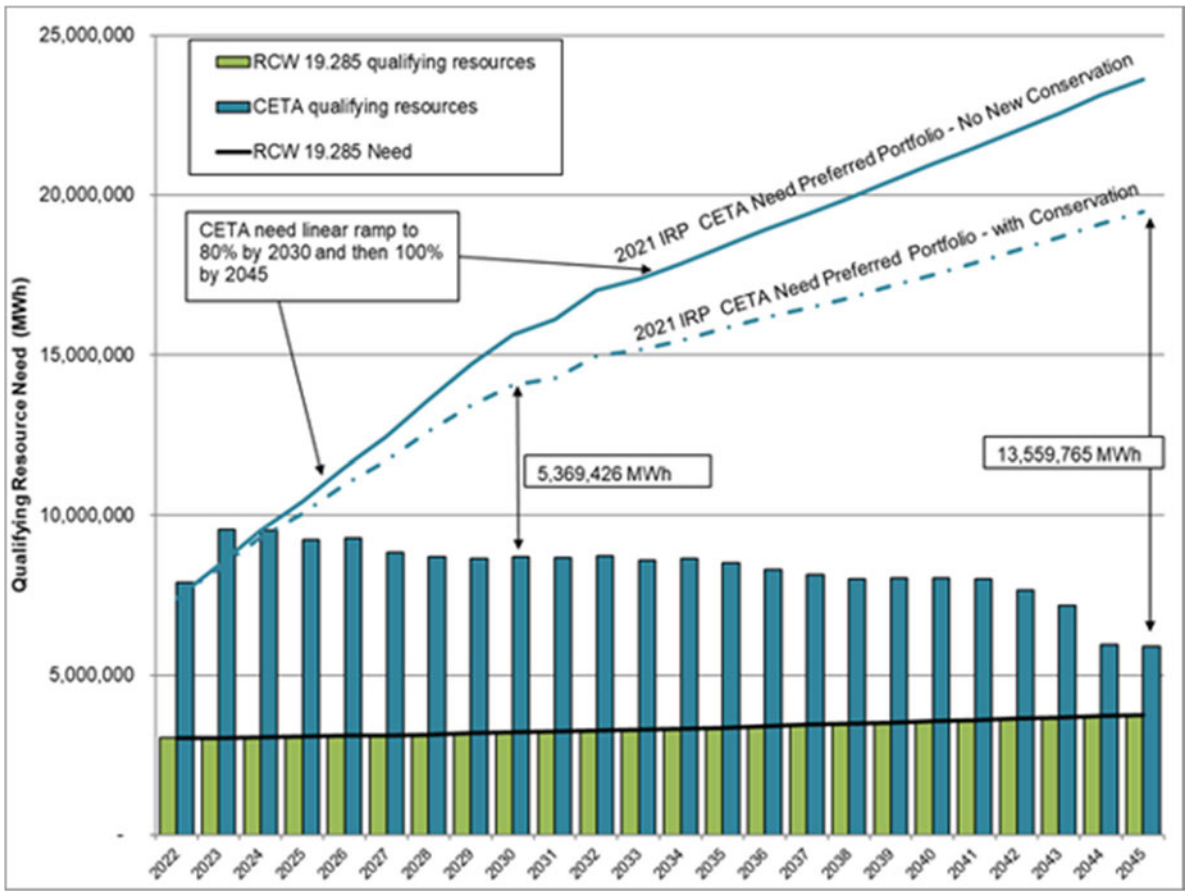


Figure 7 below shows the forecasted 2021 PSE IRP need for renewable or non-emitting resources. Similar to the capacity need in Figure 6, the renewable or non-emitting resources need in Figure 7 assumes that PSE will continue to acquire a 25% share of the output of the Projects. Failure to continue to acquire a 25% share of the output of the Projects would effectively increase PSE's capacity need on expiration of the existing agreement in 2031. Based on the 2021 IRP analysis, this would result in an increase in CETA need of about 2,166 GWhs starting in 2031.

Figure 7. ***Renewable Resource Need (CETA and RPS Compliance)***



Hydroelectric resources are of increasing importance as PSE's renewable resource portfolio expands to meet CETA compliance. Continued and potentially expanded access to Columbia River hydroelectric resources is imperative to economic system reliability, renewable resource integration, and meeting renewable energy needs, all consistent with CETA objectives. The 25% share of the output of the Projects accounts for approximately 16% of PSE's forecasted CETA need for 2045. Ensuring PSE has access to the clean energy from the output of the Projects is essential to PSE's strategy to achieve clean, reliable, and low-cost power.

5. Comparative analysis

PSE's analysis of alternatives reflects both the quantitative financial and qualitative operational implications and benefits to its customers. PSE's performed the analysis consistent with PSE's resource acquisition modeling processes. In addition, PSE has extensive history, knowledge of, and experience with the District's operations of both Projects Rocky Reach and Rock Island projects, and conducted interviews with civil, mechanical and electrical, dam safety, and regulatory personnel at the District as part of its overall due diligence processes.[2] PSE has not identified no substantive issues have been identified incremental to PSE's prior analyses. Financial modeling leading up to the 2006 agreement reflected the renewal of the Rocky Reach license, which FERC issued in 2008, as well as the impending Rock Island FERC license (2025). The District has informed PSE that the cost projections include continued Rocky Reach license implementation costs and Rock Island license processing and implementation costs, which are subject to final terms and conditions as determined by the FERC and other regulatory agencies.

PSE relied upon its experience as a resource owner and evaluator, its familiarity with the region's energy market, and analytical tools used throughout multiple IRP and RFP cycles to perform the analysis. PSE relied on two valuation methods.

1) Portfolio Optimization – PSE's resource acquisition team used the same AUROA XMP model used in the 2021 RFP to understand the costs to replace the contract with "generic" resources. Since the 2021 RFP resources latest start date is 2026 they are not direct comparisons to this PSA which starts in 2031. Instead the analysis was conducted by "fixing" the 2021 RFP selected shortlist, removing the Projects' energy and capacity contributions and allowing the model to select generic resources to fill the capacity and clean energy needs. This created a "No Chelan" portfolio. PSE compared this "No Chelan" portfolio to the base portfolio, which includes the capacity, and energy associated with the 25% share of the Projects' output under the PSA. This analysis used assumptions consistent with the 2021 RFP. The resource selected by AURORA to replace the PSA are:

    i. 237 MW of Peakers

    ii. 50 MW of Li Ion 4-Hr Battery Energy Storage

    iii. 300 MW of Eastern WA Solar

    iv. 400 MW of WY wind

2) Revenue Requirement Model – PSE also conducted an analysis of value using a Revenue Requirement model similar to the model used in the 2006 evaluation. This

[2] See Attachment 4 – Due Diligence Summary

analysis allowed PSE to compare the forecasted costs of the PSA to the update generic resource costs used in the 2023 IRP study. This excel based model allows PSE to compare cost impacts of two different replacement scenarios.

a. Wind and Peaker Scenario – In the wind and peaker scenario, PSE compared the revenue requirement of replacing the output from the Projects with 634 MW of wind resources and 358 MW of peaking resources, which together represent a portfolio of replacement resources necessary to replace the 25% share of the energy and capacity output of the Projects.

b. Optimized Portfolio Scenario – In the optimized portfolio scenario, PSE compared the revenue requirement of replacing the 25% share of the energy and capacity output of the Projects with the resource mix selected by Aurora as described in item one above. This analysis supplements the Aurora-based optimization analysis by updating generic costs and focusing on revenue requirements, as opposed to total portfolio costs reported by Aurora.

Table 1 below summarizes the forecasted costs of the PSA and the replacement portfolio. Based on these results, the range of expected benefits to the PSE portfolio are between $173 million to $969 million or about $14 to $82 per MWh.

Table 1. ***Summary of Quantitative Cost Comparisons***

Resource Alternatives	NPV Costs (2022 $000)	Levelized $/MWh
Chelan PUD PSA		
2021 RFP Phase 2 AURORA Model		
Revenue Requirement Model – AURORA replacement scenario		
Revenue Requirement Model – wind and peaker scenario		

As an additional comparison, PSE estimated the value of the 25% share of the output of the Projects to PSE's portfolio in a "bottoms up" approach that summed up the estimated market values of underlying value streams associated with the 25% share of the output of the Projects. The PSA identifies three value streams, or components, for purposes of replacement cost and margining calculations—energy, capacity, and environmental attributes. This

methodology is similar to the valuation methodology used by PSE to bid into and win competitive market sales in 2021.

- **Scenario One** – Scenario One uses a forecast of 2032 forward market prices from August 2022, and capacity and environmental attributes as described in the Collateral Annex to the PSA.

- **Scenario Two** – Scenario Two uses the energy value of the IRP mid energy price forecast, a capacity value based on a $20/MWh adder (which is equal to about $93 per MW-year), and an environmental adder based on the Washington Department of Ecology's Climate Commitment Act "floor" forecasts.

- **Scenario Three** – Scenario Three calculates the average energy and capacity values from the short-list resources from the 2021 RFP short-list resources presented to PSE's Energy Management Committee in November of 2022. Please note that this scenario may not reflect a direct comparison due to difference in timing of resources. Additionally, it is important to note that PSE selected these resources for the short list to meet the needs of the 2021 RFP, meaning that these resources, if acquired by PSE, would not be available to replace the 25% share of the output of the Projects. Given these limitations, the analysis allows a comparison of the value of the 25% share of the output of the Projects relative to known market options at the time of the decision. Finally, as a final note regarding Scenario Three – all of the energy resources included in RFP shortlist are renewable resources, and the energy costs for such resources include the environmental attributes associated with those resources.

Table 2 below summarizes the 2032 "bottoms up" valuation under three scenarios.

Table 2. ***2032 "Bottoms Up" Valuation Under Three Scenarios***

Scenario	Energy ($/MWh)	Capacity ($/MWh)	Environmental Attributes ($MWh)	Total ($/MWh)
Scenario One	$ 56	$		
Scenario Two	$ 43	$ 20	$ 14	$ 77
Scenario Three	$ 54	$ 23	$ 0	$ 77

As reflected in Table 2, the costs of all three of scenarios are higher than the projected levelized costs of about $ per MWh of the PSA with the District.

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SECTION 5. COMPARATIVE ANALYSIS

All of these analyses project that the proposed PSA with Chelan PUD will provide significant benefits to PSE. Additionally, the renewal of this PSA aligns with public and state policy preferences and, specifically, the Clean Energy Transformation Act. Attachment 5 describes key assumptions, the alternative analysis and results.

6. Key Risks

PSE considers the PSA and the 25% share of the output of the Projects to be low risk resources. Each of the Projects is fully licensed and operating, the District has extensive experience relicensing, and PSE's due diligence review did not reveal any "fatal flaws" that would preempt consideration of entering into the PSA.

The principle ongoing risk during the term of the PSA are relicensing risks, uncertainties of future costs, the potential for underperformance of the Projects that could impact their ability to contribute renewable energy credits ("RECs") to help meet PSE's CETA needs, and default by the counterparty.

The District's Relicensing Schedule and Plan is Reasonable

Based on review of documentation provided by the District and interviews with District management, it appears that Chelan PUD has completed initial consultations resulting in an executed Settlement Agreement and Implementation Plan. Relicensing efforts appear to be going well with no unexpected issues with respect to fish, wildlife, or recreation at this time. The District reported that there were "no surprises" from stakeholders and that the District had largely anticipated mitigation requests based on previous internal discussions. Chelan PUD has budgeted a cost of $20 million to support relicensing efforts, but the District believes that actual relicensing costs will almost certainly be higher.

The District's strategy largely continues its current fish passage, Habitat Conservation Plan, and other requirements from the current license, with some minor adjustments to fish passage and wildlife programs. For a more detailed assessment of risks and proposed mitigations, see Attachment 4.

The District's Cost Forecast Appears Reasonable, and Chelan PUD Has an Incentive to Control Costs

PSE will carry the risk that future costs under the PSA could be higher than are currently forecast. The interests of PSE and the District align to maintain operating costs as low as possible while maintaining efficient operations at the Projects. This alignment results from the fact that, although PSE will share a contractual obligation to pay for a 25% share of the costs of the Projects, 25%, the District has exposure of up to 65% of the costs of the Projects. Unnecessary expenses would prove a bigger burden to the District and its retail customers than then would for PSE and its retail customers. This alignment of interests provides a natural incentive for efficient operations of the Project.

Production Risk

The PSA entitles PSE to a 25% share of the output of the Projects. Although the Projects have access to storage in the form of ponds behind each dam, hydroelectric generation is variable

from year to year. PSE has extensive experience managing and operating its existing share of the output of the Projects. Attachment 5 contains an assessment of the current generation forecast and compares that generation forecasts to assumptions used in the 2023 IRP Progress Report. It is also important to note that the only commercially viable clean energy resource alternatives are currently wind and solar resources, each of which are variable energy resources that carry their own production and variability risks. PSE faces a large need for CETA resources, and the PSA permits PSE to secure a large amount of hydroelectric generation to maintain a diverse portfolio of renewable resources.

Counterparty Default

As mentioned in section 2, Chelan PUD is a financially stable counterparty with a long history in the region and as a business partner with PSE. PSE estimates that counterparty default with respect to the District to be a relatively minor risk. In the unlikely event that the District defaults or fails to perform its obligations, the PSA includes remedies for PSE to receive payment for the lost energy, capacity, and environmental attributes associated with the 25% share of the output of the Projects.

Please see Section 2 and Attachment 3 for a summary of the terms and conditions of the PSA. Please see Attachment 4 for a discussion of detail regarding the due diligence conducted by PSE subject matter experts. Finally, please see Attachment 5 for a comparison of historic hydro generation and the expected generation based on the 2023 IRP Progress Report.

7. Contract and Project Benefits

The PSA to renew PSE's 25% share of the Projects output helps to meet Company's capacity and CETA-driven renewable resource needs at the lowest reasonable portfolio cost to customers considering risk and benefits across PSE's portfolio of resources.

- The PSA is a cost competitive and helps to meet PSE's CETA energy and capacity resource needs beginning in November 2031.
- The PSA aligns well with PSE's goal to meet Washington state's clean energy goals by providing nearly 2,000 MWhs of clean carbon free, CETA compliant energy per year.
- Provides PSE access to 25% of the Rocky Reach and Rock Island pondage to provide operational flexibility and market value optimization in both day ahead and real time markets.
- Provides PSE increased flexibility by providing operating reserves and integration ability for existing and new variable energy resources into PSE's portfolio.
- Continued PSE commitment to Washington State based generation resources and presence in resident state interests.

The Confederated Tribes of the Colville Reservation and the Confederated Tribes and Bands of the Yakima Nation are key stakeholders in the relicensing process. By renewing the contract, PSE maintains a footprint in the discussions and shares in the costs of operating the projects in a way approved by FERC and influenced by the stakeholders. The current contract, relicensing process, and contract renewal will provide opportunities to balance the interests of PSE customers, Chelan PUD customers, and members of the tribes and other stakeholders.

Additionally, the 2021 CEIP assumes that PSE would continue acquisition of a 25% share of the output of the Projects. Therefore, the existence of an agreement similar to the PSA forms a baseline for purposes of achieving the aims of CETA, including the equitable distribution of benefits, such as

- energy and non-energy 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.

In this regard, the PSA allows PSE to continue to secure a long-term source of valuable capacity, energy, and environmental benefits at a reasonable cost for the benefit of PSE's customers. The competitive cost of the power under the PSA reduces pressures on increases to PSE power costs, thereby mitigating the energy burden on low-income customers and vulnerable populations and highly impacted communities. Additionally, the relative flexibility of generation associated with the Projects provides PSE with an increased ability to integrate wind and solar resources that PSE must acquire to achieve the goals identified by CETA.

PSE also recognizes that the District is an electric utility subject to the same requirements under CETA. Chelan PUD has identified wholesale market sales, such as that under the PSA, as important elements to its efforts to the equitable distribution of benefits of low-cost, clean renewable hydropower to low-income customers and vulnerable populations and highly impacted communities in the District's service area. Specifically, the District uses revenue from wholesale market sales, such as the PSA, to maintain rates for its customers, especially its most vulnerable populations, and to fund the development and implementation of a low-income energy efficiency program authorized by the District's Board of Commissioners and targeted at reducing the energy burden of the most vulnerable populations by lowering energy bills.

8. Regulatory Process, Rate Impacts, and Recommendation

Regulatory Process, Rate Impacts, and Recommendation

PSE may seek a determination of prudence of the PSA as part of a multi-year rate plan as early as a general rate case filing with the Washington Utilities and Transportation Commission ("WUTC") in 2025. The WUTC may delay a final decision on prudence of the PSA for a proceeding closer in time to that PSE will start taking delivery under the terms and conditions of the PSA (i.e., November 1, 2031).

Rate impact of PSA

PSE forecasts a levelized cost of $____/MWh for the PSA. The Resource Acquisition team analyzed the net incremental effect on electric rates of the PSA based on 2032 costs (i.e., the first full calendar year of the PSA) and the 2023 electric revenue requirement, which includes the costs of the existing contracts with Chelan PUD. This analysis resulted in a projected net incremental effect of the PSA on electric rates of one and six-tenths percent (1.6%). As described in in section 5, the comparable replacement resources would have higher costs and by extension a higher rate impact.

Recommendation

Based on the determination of need, the analysis of alternatives, and the project benefits presented in this report, PSE recommends that the Board of Directors adopt the Resolutions set forth in Attachment 1 to enter into the PSA with Chelan PUD.

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PUGET SOUND ENERGY

PSE Report to the Board of Directors:
Chelan PUD Power Sales Agreement

Attachment 1. Board Resolutions

Board Resolutions

PUGET SOUND ENERGY, INC. PROPOSED BOARD RESOLUTIONS

Approval of Renewal of Chelan County PUD Hydro Power Purchase Agreement

WHEREAS, Public Utility District No. 1 of Chelan County, Washington ("Chelan") is the owner and operator of the Rocky Reach and Rock Island hydroelectric generation facilities with an aggregate nameplate capacity of approximately 1978.4 MW located in Chelan County, Washington (the "Hydro Projects");

WHEREAS, PSE and its predecessors have had an ownership or contractual interest in both Hydro Projects since their construction, and currently PSE and Chelan are parties to that certain Power Sales Agreement dated as of February 3, 2006 (the "Existing Chelan Contract"), pursuant to which PSE has a right to 25% of the output of the Hydro Projects;

WHEREAS, the Existing Chelan Contract will expire on October 31, 2031;

WHEREAS, PSE has been engaged in negotiations with Chelan with respect to a new Power Sales Agreement to include, among other items, a delivery term commencing November 1, 2031, and expiring on October 31, 2051, such Power Sales Agreement substantially with the terms and on the conditions as presented at this meeting and as described in the materials provided for this meeting (the "New Chelan Contract");

WHEREAS, management has presented information to the Board of Directors of PSE (the "Board") regarding the negotiation of the New Chelan Contract and management's assessment of the operational and financial benefits to the Company and to its customers of entering into it;

WHEREAS, with input from management, the Board has considered information relating to the New Chelan Contract as the Board has deemed appropriate; and

WHEREAS, the Board has determined that it is in the best interest of PSE that PSE enter into the New Chelan Contract subject to the conditions set forth in the New Chelan Contract;

NOW THEREFORE, BE IT RESOLVED, that the Board hereby adopts and approves the New Chelan Contract, as summarized in the materials provided to the Board;

RESOLVED FURTHER, that the officers of PSE are, and each of them hereby is, authorized in the name and on behalf of PSE to execute and deliver the New Chelan Contract, together with such modifications thereto as any of such officers shall approve, the execution thereof on behalf of PSE to be conclusive evidence of such approval by the Board.

ATTACHMENT 1. BOARD RESOLUTIONS

RESOLVED FURTHER, that PSE's officers are, and each of them hereby is, authorized to do and perform or cause to be done or performed all other acts necessary or desirable in order to effectuate the transactions contemplated by the New Chelan Contract, including, but not limited to, (i) the engagement, by written contract or otherwise, of any and all persons deemed necessary, appropriate or desirable to effectuate the transactions contemplated by the New Chelan Contract and related documents, upon such terms and conditions as such officers, or any of them, may deem appropriate, and to pay all fees and expenses incurred in connection therewith, (ii) the preparation and filing with appropriate governmental authorities of all applications, notifications, certificates, reports, statements or other documents or instruments relating to the New Chelan Contract and the other transactions contemplated by the New Chelan Contract, including any applications, certificates or other filings required under the rules and regulations of the Securities and Exchange Commission and the laws of the State of Washington, and to arrange for payment of any fees required in connection therewith, and (iii) all such other acts and things which any one or more of them shall deem necessary, advisable or appropriate in order to carry out the intent and purpose of the foregoing, and the taking of any and all such actions and the performance of any and all such things in connection therewith shall conclusively establish each such officer's authority therefor from PSE and the approval and ratification thereof by the Board.

RESOLVED FURTHER, that each of the officers of PSE or any of them are authorized, in the name and on behalf of PSE, to perform such acts and to execute and deliver such documents as they or any of them deem necessary or advisable to carry out the intent and purpose of these resolutions, including, but not limited to, the execution of any necessary or advisable agreements, instruments, certificates, affidavits, or other documents in connection therewith, and the taking of any and all such actions and the execution of any and all such documents or instruments in connection with the foregoing shall conclusively establish their authority therefor from PSE and the approval and ratification thereof by the Board.

PUGET SOUND ENERGY

PSE Report to the Board of Directors:
Chelan PUD Power Sales Agreement

Attachment 3. Material Terms of the PPA

Material Terms of the Chelan Renewal PPA

Transaction Description:	Power Purchase Agreement ("**PPA**") with Public Utility District No. 1 of Chelan County, Washington ("**Chelan PUD**" or the "**PUD**") to purchase a 25% share of output from the Rock Island and Rocky Reach hydroelectric projects (the "**Projects**") and any expansion of the generating capacity of the existing Projects (collectively, the "**Chelan Power System**").
Generating Facility:	Chelan Power System.
Delivery Term:	November 1, 2031 to October 31, 2051.
Product and expected Generation:	Contract entitles PSE a 25% share or slice of the output of the Chelan Power System. This is the current equivalent of about 444 MW of capacity and 2,166 GWh of non-emitting energy. Actual output will be adjusted based on hydrological conditions and operating constraints as determined by Chelan PUD. PSE has the ability to use a dynamic schedule, which will allow PSE to operate the output of the Chelan Power System as if it were part of PSE's system. Output of the Chelan Power System is contractually defined and includes the following benefits: 1. Energy 2. Capacity 3. Environmental Attributes 4. Most ancillary attributes (such as load following, regulation, and reserves).
Points of Delivery:	The Points of Delivery are as follows: 1. Cascade (formerly White River) – Rocky Reach 230 kV Transmission Line (Puget Sound Energy interconnection) 2. Maple Valley – Rocky Reach 230/345 kV Transmission Line (BPA interconnection)

3. Rocky Reach – Columbia #2 230 kV Transmission Line (BPA interconnection)

4. Chelan Rocky Reach – Columbia #2 230 kV Transmission Line (Grant PUD contractual interconnection)

5. Rocky Reach – Columbia #1 230 kV Transmission Line (BPA interconnection)

6. Rocky Reach – Douglas 230 kV Tie Line (Douglas PUD interconnection)

7. Valhalla Substation (Rock Island) (BPA interconnection)

Contract Price: The energy generated from the Chelan Power System is forecasted to have a levelized cost of $____/MWh delivered at any of the Points of Delivery listed above. The contract has four major pricing components, and PSE will pay a 25% share of each of these components, consistent with PSE's share of output of the Chelan Power System.

1. Net Cost – PSE will pay a 25% share of the costs to own, operate, maintain, repair and improve the Chelan Power System. These costs include but are not limited to:

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a. Operating and Maintenance Costs - All operating and maintenance costs of every kind and description, both direct and indirect ("**Operating Costs**"), paid or accrued by the District with respect to the operation, maintenance and repair of, or the production, sale or delivery of Output from, the Chelan Power System or any part thereof. Including, Taxes and Assessments, Certification, Relicensing and Decommissioning Costs Litigation Loss Prevention.

b. Financing Costs - The monthly accrual, as determined by the District costs payable or deemed payable by the District or the Chelan Power System, as the case may be, in connection with the issuance, incurring and carrying of Debt Obligations. These costs can include Outstanding Debt Obligations, Future Debt Obligations, Refunding Obligations.

2. Transmission Charges – As specified in the District's OATT.

3. Fixed Annual Payment – Per a fixed schedule include in contract.

4. Other Costs

   a. Capital Recovery Charge - PSE will pay to the PUD each month of each contract year an amount equal to one twelfth (1/12th) of the PSE's percentage (i.e., 25%) of an annual capital recovery charge (the "Capital Recovery Charge"), which Capital Recovery Charge shall be an amount equal to the product of (i) a capital recovery charge base of $44 million (in 2021 dollars), as escalated by the Consumer Price Index to such contract year, multiplied by (ii) fifty percent (50%).

   b. Coverage Fund Charge - PSE will pay to the PUD each month of each contract year an amount equal to one twelfth (1/12th) of the PSE's percentage (i.e., 25%) of the coverage amounts necessary for debt obligations associated with the Chelan Power System (the "Coverage Amount"), which the PUD shall deposit into coverage funds.

   c. Debt Reduction Charge - PSE will pay to the PUD each month of each contract year an amount equal to one twelfth (1/12th) of the PSE's percentage (i.e., 25%) of annual debt reduction charge (the "Debt Reduction Charge"), which Debt Reduction Charge shall be computed by multiplying (i) the aggregate principal amount of all debt obligations associated with the Chelan Power System outstanding as of the first day of the applicable contract year and (ii) three percent (3%).

   d. Debt Reduction Charge Adjustments - If the PUD purchases, redeems or defeases outstanding debt of the Chelan Power System from moneys on deposit in the Capital Recovery Charge Fund or Debt Reduction Charge Fund, or from proceeds of insurance received with respect to components of the Capital Improvements that the PUD elects not to repair, rebuild or replace, all as determined by the PUD, the PUD shall provide PSE with a credit against its monthly Financing Costs otherwise due from time to time hereunder,

spread over a 25 year period from the month following the month of calculation.

e. Working Capital Charge - $8,000,000 which represents 25% share of $32,000,000 stated in 2021 dollars.

Transmission Services: The Seller will reserve Firm Point to Point Transmission on their system to deliver the output to the eligible PODs.

Control Operation and Maintenance:

1. Consistent with Prudent Utility Practice - The PUD shall operate and maintain the Chelan Power System in accordance with Prudent Utility Practices and shall use Commercially Reasonable Efforts consistent with Prudent Utility Practice to keep the Chelan Power System in good operating condition at all times.

2. No Right of Control to PSE - PSE does not have any right of control over the operation or maintenance of or repairs, renewals, additions, improvements or replacements to any of the PUD's generation, transmission or distribution facilities or the financing for such activities.

3. Limit on Physical Starts attributed to PSE - The Units at the Projects were designed for a limited number of Physical Start Cycles. PSE shall be allocated 4350 Allowable Start Cycles for any 24-month rolling period when PSE's Percentage equals twenty-five percent which is its pro-rata allocation of forecasted allowable Physical Start Cycles at the Projects. The PSE Allowable Start Cycles per calendar year may increase over the Term of this Agreement as units are rehabilitated

Relicensing Support and Cooperation:

1. Rock Island Licensing - PSE covenants and agrees to use Commercially Reasonable Efforts, at its cost and expense, to support the PUD's efforts to obtain a new license for Rock Island. The PUD's current FERC license for Rock Island expires on December 31, 2028.

2. Regulatory Support - Each Party will act reasonably in support of any request by the other Party for review or approval by any Regulatory Authority of this Agreement (or costs incurred thereunder).

3. Canadian Entitlement - PSE will provide reasonable support for the PUD's efforts to obtain a reduction in Canadian Entitlement at such

times and in such a manner as the PUD reasonably requests in writing.

Force Majeure: Force Majeure is defined as any event or circumstance which prevents or delays a party from performing under the PPA and where (a) such event or circumstance is not within the reasonable control of the party claiming force majeure, (b) the party claiming force majeure has taken all reasonable precautions and measures to avoid or mitigate such force majeure, and (c) such force majeure is not the direct result of the negligence or failure of the party claiming force majeure.

Other Contract Terms Included in the PPA:

1. Governing Law - State of Washington
2. Venue - Venue for any legal action arising from this Agreement shall be in the Superior Court of Washington for Chelan County.

Default: An event of default, with respect to a party, is the occurrence of any of the following:

- the failure PSE to make, when due, any payment required pursuant to the Agreement if such failure is not remedied within two (2) business days after receipt of written notice;
- any representation or warranty made by a party is false or misleading in any material respect when made or when deemed made or repeated;
- the failure of a party to perform any material covenant or obligation set forth in this Agreement (except to the extent

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constituting a separate event of default) if such failure is not remedied within 30 days after receipt of written notice;

- with respect to such party, (i) an adjudication of bankruptcy or insolvency, or the entry of an order for relief, under any bankruptcy law with respect to such party; (ii) the making by such party of an assignment for the benefit of its creditors; (iii) the filing by such party of a petition in bankruptcy or for relief under any bankruptcy law; (iv) the filing by such party of an answer or pleading admitting or failing to contest the material allegations of any petition in bankruptcy or for relief under any bankruptcy law filed against such party; (v) the general inability of such party to pay its debts as they fall due; (vi) the filing against such party of any petition in bankruptcy or for relief under any bankruptcy law; (vii) the appointment of a liquidator, administrator, trustee, conservator or receiver for such party or for all or any substantial portion of its assets; or (viii) the taking by such party of any action for its winding up or liquidation, or the consent by such party to any of the actions described in clauses (i) through (vii) being taken against it.

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- the failure of PSE to provide [redacted] or [redacted] in the time and manner required by the Agreement and the Collateral Annex;

- a Party consolidates or amalgamates with, or merges with or into, or transfers all or substantially all of its assets to, another entity and/or assigns to another entity without the express written consent of the other party or, in the case of PSE, PSE suffers a change in control in violation of the terms and conditions of the Agreement;

- the occurrence and continuation of event of default, however defined, in respect to any Slice Contract, WSPP Transaction, or any other transaction between the parties relating to the purchase or sale of power;

- the failure of PSE to take its percentage of the Output under within three (3) business days after written notice thereof to PSE;

- the failure of PSE to perform its operational obligations under the Agreement if such failure is not cured within three (3) business days after written notice thereof;

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- the occurrence of any default, event of default, or [redacted] default (however defined) under any Collateral Annex; or
- the decommissioning or permanent retirement of one or both Projects.

Termination: The Agreement may only be terminated

- by mutual agreement of the parties;
- by either party if necessary approvals have not occurred by the delivery start date (i.e., November 1, 2031);
- by Chelan PUD if PSE has defaulted and has not cured the specified default within the cure periods; or
- by Chelan PUD if PSE has postponed any condition precedent to the Agreement and has failed to satisfy such postponed condition precedent within 180 days following the delivery start date (i.e., May 28, 2032).

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PSE Report to the Board of Directors:
Chelan PUD Power Sales Agreement Renewal

Attachment 5. Key Assumptions and Comparative Analysis

Introduction

Chelan Public Utility District No. 1 (the "District"), who owns and operates the Rocky Reach and Rock Island Hydroelectric Projects("Rocky Reach", "Rock Island", or collectively "the Projects"), approached Puget Sound Energy ("PSE" or "the Company" in 2021 for the purposes of 1) extending the Power Sales Agreement (the "PSA") executed between the District and PSE in 2006 and expiring in 2031; and 2) resolving interpretation and valuation of Environmental Attributes ("EAs") as defined by Section 23.11 of the 2006 PSA. PSE and the District, engaged in parallel negotiations on both issues and in early 2022 prioritized resolving the EA issue. PSE and the District executed an agreement to resolve the EA issue, allowing PSE to claim the Renewable Energy Credits ("RECs") generated by the Projects in August 2022. With the EA issues resolved, the District and PSE focused on finalizing negations for a PSA renewal. Under the proposed PSA renewal, deliveries would commence in November 2031 and provide PSE with continued access to 25% of the District's CETA qualifying energy, capacity and ancillary services from the Projects.

This memorandum presents additional details and discussion of some of the relevant key assumptions, modeling methodologies, and results that are summarized in the Chelan Renewal Report to the Board of Directors ("the BOD Report"). The memo is organized into the following sections:

1. Chelan PSA specific assumptions
    i. Cost forecast
    ii. Generation forecast
2. PSE's Resource Need
3. Comparative analysis methodology and results
    i. 2021 RFP Aurora Optimization
    ii. Resource Analyzer
    iii. Bottoms up or market valuation analysis

1) Chelan PSE Specific Assumptions

PSA Cost Assumptions

The contract identifies four major pricing components: a Fixed Annual Payment, Net Operating Costs, Transmission Costs, and Other Costs. PSE will pay a 25% share, consistent with its share of output for these costs as specified in the contract. The pricing components are described in Attachment 3, Material Terms, and in the contract itself. For the purposes of estimating future costs, PSE relied on costs forecasts shared by the District and approved by their board of directors. This section summarizes the Fixed Annual Charges and the forecast of Production Costs, which include all costs other than the fixed charge. Table 1 below shows PSE's proportional share of both the Fixed Annual Charges and the Productions Cost.

Table 1: Fixed Annual Charge

Contract Year	PSE Fixed Annual Costs	PSE Production Costs
2031	$	$
2032	$	$
2033	$	$
2034	$	$
2035	$	$
2036	$	$
2037	$	$
2038	$	$
2039	$	$
2040	$	$
2041	$	$
2042	$	$
2043	$	$
2044	$	$
2045	$	$
2046	$	$
2047	$	$
2048	$	$
2049	$	$
2050	$	$
2051	$	$

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Fixed Costs

Chelan and PSE have agreed to schedule of the "Fixed Annual Charge". PSE's monthly payments will include a proportional share, 25% of the annual costs divided over 12 months. Table 1 below shows PSE's proportional share that was used in the comparative analysis. Please note that 2031 and 2051 have been adjust to reflect only two and 10 months of payments, respectively, to reflect those partial years within the term of the contract.

Production Costs

PSE used a production cost forecast based on information provided by the District. The District provided a forecast of costs through 2041. Costs from 2041 through 2051 were extrapolated based on the forecast provided by the District. Additionally, PSE adjusted the transmission costs forecast to be consistent with the transmission assumptions in the 2021 All-source RFP ("2021 RFP"). The production

costs assumptions had an average growth rate of two and five-tenths percent (2.5%), confirming a conservative cost assumptions relative to the historic costs of the contract.

Table 2 below shows the annual costs of the existing PSA with Chelan. These costs represent a 25% of production costs that is the O&M, financing, transmission and all other costs specified in the existing contract. Please note, PSE did not include 2012 and 2022 in this comparison since 2012 was a partial year and 2022 was not complete at the time of evaluation. The costs paid to Chelan have had an average growth rate of two and three-tenths percent (2.3%) over the time period shown.

Table 2 Historic Production Costs

Year	Total Chelan Costs	Annual % Change in Costs
2013	$	
2014	$	
2015	$	
2016	$	
2017	$	
2018	$	
2019	$	
2020	$	
2021	$	

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Generation Forecast

PSE's assumption of future generation for the PSA is an average of 2,165,917 MWh per year. This assumptions is based on the energy output from the Aurora output as modeled for the 2023 Integrated Resource Plan Progress report ("2023 Progress Report"). This results in a conservative output assumption, with less annual generation than both the historic generation forecast as well as the forecasted impacts of climate change.

Historic Generation Forecast

PSE's historic 80-year average generation estimates are consistent with the assumptions in the 2022 General Rate Case ("2022 GRC"). Those assumptions have been documented in the 2022 GRC as part of testimony and are consistent with the forecasting methodology PSE used at the time for its 2021 Integrated Resource Plan ("2021 IRP"), resource acquisitions, and power cost modeling. Using this 80-year median generation forecast, the combined annual output for the Projects is 2,284,545 MWh while the average annual output is slightly lower at 2,268,734.

2023 Progress Report Generation Forecast

PSE's 2023 IRP Electric Progress Report was not available at the time of this evaluation, however, PSE was able to use selected inputs and methodologies that are consistent the 2023 IRP Electric Progress Report. A full description of the climate change output modeling will be presented in the 2023 IRP Electric Progress Report.

PSE incorporated climate change into the generation forecast using water forecasts and stream flow data for three climate models developed by River Management Joint Operating Committee[1]. Stream flow data for these three climate models were processed using GENESYS, the resource adequacy model developed by the Northwest Power and Conservation Council, to obtain monthly energy generation estimations. Monthly energy generation estimates were provided for a 30-yr forecast period, 2020 to 2049. Data for all 30 years were averaged to obtain an expected generation shape for each climate model. PSE then averaged the monthly energy generation values for all three climate models to obtain this deterministic energy generation estimate for each hydro project. PSE forecasts average annual generation of 1,768,201 MWh and 626,015 MWh for Rocky Reach and Rock Island, respectively, or 2,394,216 MWh for both projects.

2) PSE's Resource Need

This section summarizes the process used to determine PSE's capacity and energy needs.

As described in Section Four of the BOD Report, PSE relied primarily on the resource needs identified in the 2021 IRP and 2021 RFP. A full discussion of the methodologies and results of the needs assessment can be found in those documents. However, it is important to note that both the 2021 IRP and 2021 RFP analysis of resource need assumed that PSE is able to renew or extend the PSA beyond 2031. This means that if PSE were not to extend the PSA contract, PSE's need would then in turn increase by the forecasted generation and capacity amount of this renewal deal. This would be an increase of approximately 444 MW of capacity need and 2,166 GWh of energy in 2031 when the existing PSA is scheduled to expire.

Figure 1 and Figure 2 below show PSE's capacity and renewable need from the 2021 IRP and 2021 RFP. PSE capacity need is driven by the need to have physical capacity to meet reliability obligations. The clean energy need is driven primarily by Washington State's Clean Energy Transformation Act ("CETA") compliance needs.

Subsequent to the approval of the 2021 RFP in June 2021, PSE released its F21 load forecast, which increased the need for new capacity resource from 527 MW to 771 MW for December 2027. As a condition of the 2021 All-Source RFP approval, the WUTC required PSE to hold a stakeholder workshop to review and discuss the market reliance analysis presented in the 2021 IRP. PSE conducted the market reliance workshop on September 30, 2021 and outlined steps that would inform PSE's market reliance decisions in Phase 2 of the RFP.

[1] River Management Joint Operating Committee is a consortium of Bonneville Power Administration, US Army Corps of Engineers and US Bureau of Reclamation.

In December 2022, PSE published the "Electric Draft Portfolio Results". While these results are not final, the preliminary results indicated that both PSE's capacity and CETA need are still growing.

Figure 1 *Capacity Resource Need*

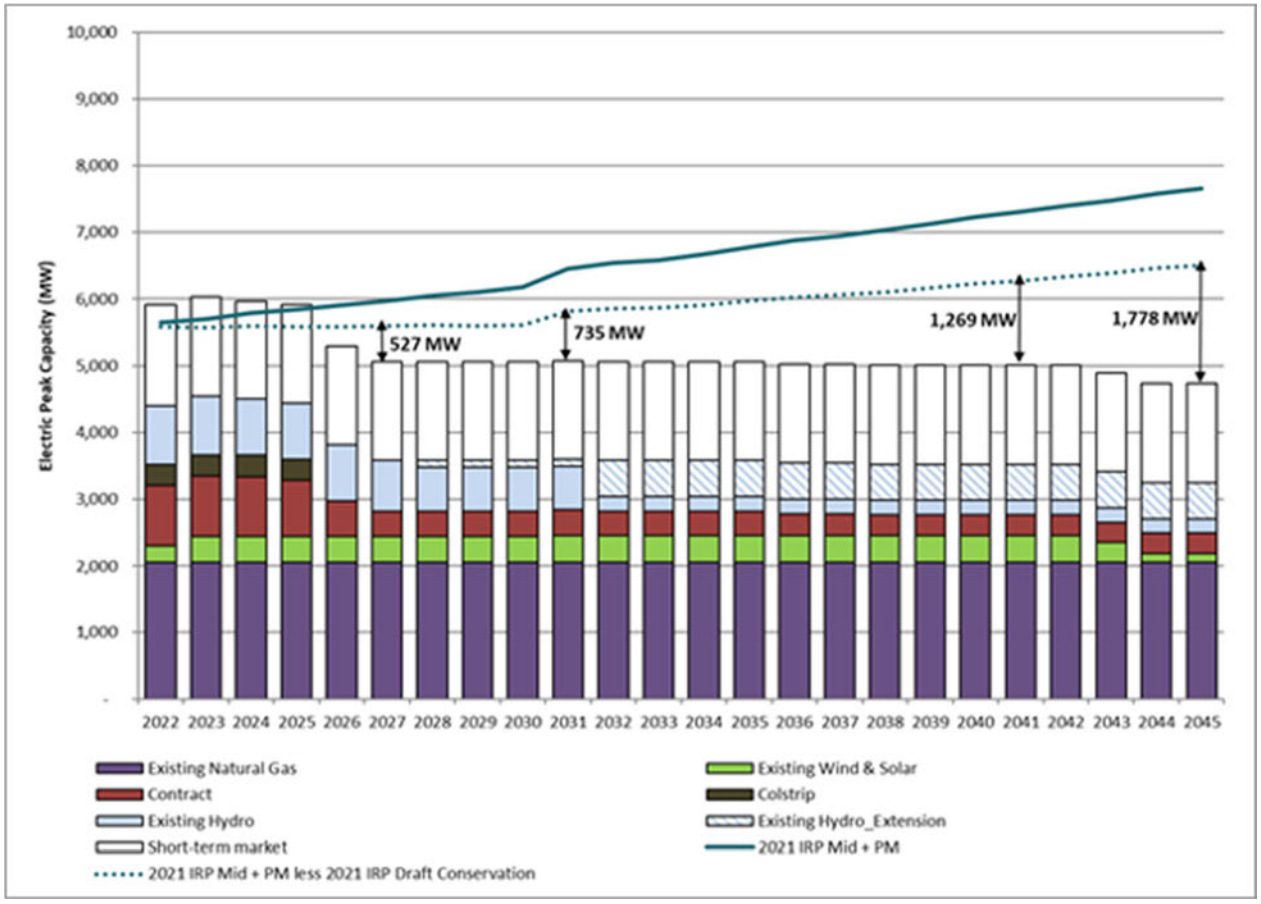
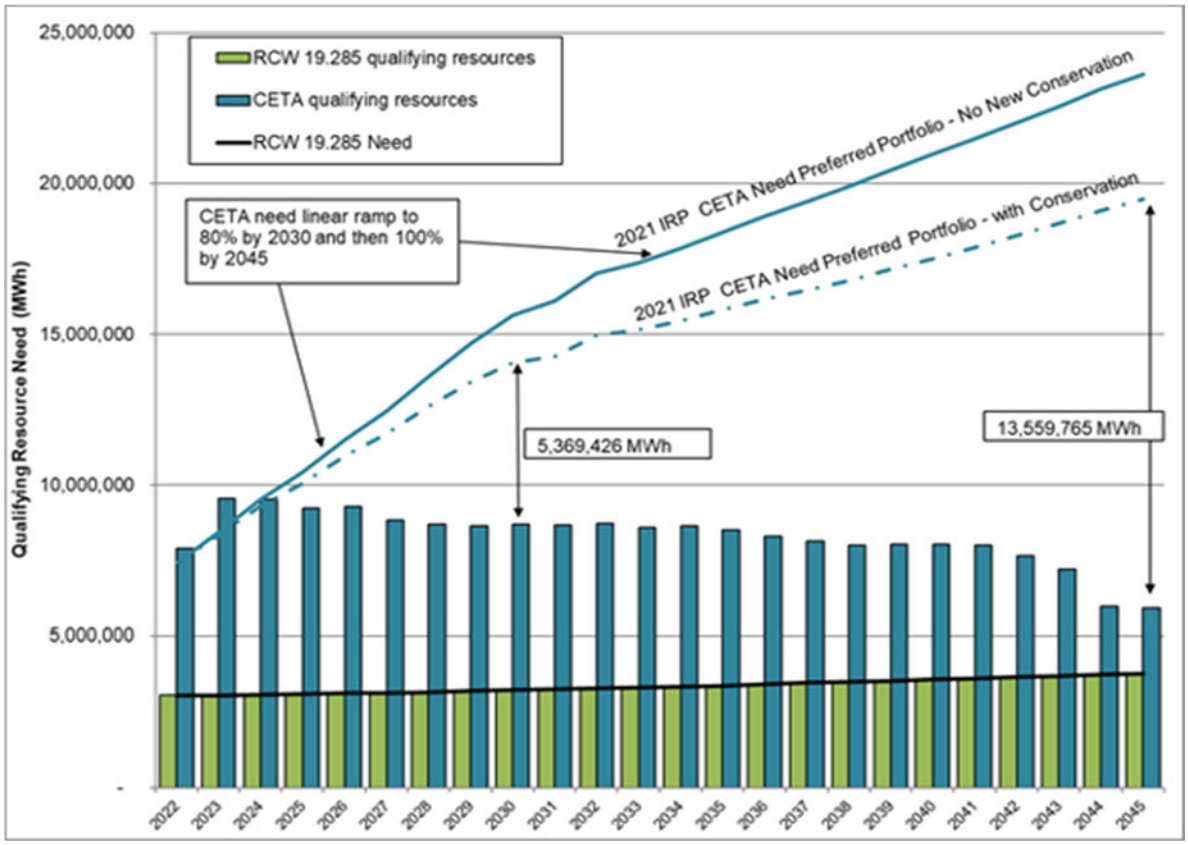


Figure 2 Renewable Resource Need (CETA and RPS Compliance)



3) Comparative Analysis Methodology and Results

This section summarizes some of the key assumptions a modeling methodologies used to evaluate the PSA renewal.

Since many of the models and assumptions used are the same as those used in the 2021 PSE IRP, 2021 PSE RFP, and the upcoming 2023 IRP Progress Report, this document does not reproduce all the details presented in those documents. For additional detail on assumptions not discussed below, please refer to those respective documents previously mentioned.

PSE used two primary models to perform the quantitative analysis for the PSA renewal: Energy Exemplar's Aurora model and the PSE's Resource Analyzer model. This section describes at a high level our models and assumptions. For a more robust discussion of the Aurora model and assumptions see

Appendix G to the 2021 IRP2, and any updated documentation that will be published with the 2023 Progress Report.

Aurora modeling and results summary

Energy Exemplar's Aurora model is used to perform long term capacity expansion to select resources to meet future PSE needs, while maximizing the resource values to the PSE portfolio. Starting from the final 2021 IRP preferred portfolio, the needs are reviewed and updated as new information becomes available throughout the evaluation process, including: (1) load forecast, (2) planning reserve margin, and (3) CETA need. Due to the timing of the evaluation of the Chelan PSA, PSE was able to rely on the updates for the 2021 RFP Phase 2 evaluation.

In Phase 2, Aurora Long-Term Capacity Expansion ("LTCE") logic was utilized to co-optimize all RFP resources selected out of Phase 1 along with generic resources developed by the 2021 IRP to fill the PSE needs. The study horizon in Phase 2 is 20 years, from 2023 to 2042, to best align with the timeline of most RFP offers. The begin date or commercial operation date for the RFP resources is in the 2023-2027 window while that for the generic resources is 2028-2042. The model produced an optimal portfolio that resulted in a shortlist that was presented to the EMC in October 2022. This combination of the shortlist resources, the PSA, and the generic resources becomes the "base case" or the "Chelan Renewal" case.

PSE then used Aurora to create a "No Chelan" portfolio to compare to the "Chelan Renewal" case. This was done by "locking" the shortlist in place and then removing the Chelan output in 2031. The energy and capacity deficit that results from removing the Chelan resource is then allowed to be filled with generic resources. Table 3 describes the total buildout of resources and costs for each scenario. In the "No Chelan" portfolio, the portfolio grows by almost 1000 MW in new resources and the net present value of costs increased by almost $969 million. Since the "Chelan Renewal" portfolio includes $818 million in PSA costs, this means the "No Chelan" portfolio results in an incremental costs of $1,787 million.

[2] *Appendix G: Electric Analysis Models* https://www.pse.com/IRP/Past-IRPs/2021-IRP

Table 3 Aurora portfolio comparison (Nameplate additions in MW)

Resource Type	Base Case Portfolio (MWs)	No Chelan Portfolio (MWs)	Replacement Builds (MWs)
Shortlist Resources	1,764	1,764	-
Green Direct and DER	412	423	11
Generic NG_Frame Peaker	237	474	237
Generic Li-Ion	825	875	50
Generic Solar WA East	1,098	1,396	298
Generic Wind WA	1,300	1,300	-
Generic MT Wind Eastern	200	200	-
Generic MT Wind Central	200	200	-
Generic DER Roof	80	80	-
Generic Wind WY East	-	400	400
Generic DER Solar PV	24	24	-
Generic DER Storage	102	102	-
Total Resource Builds	6,243	7,239	996
NPV Portfolio Costs ($000)	$	$	$ 969,381

Key modeling input assumptions

PSE used assumptions consistent with Phase 2 of the 2021 RFP for this analysis. This section provides a brief summary of the source of the assumptions. The full details of the assumptions can be found in PSE's 2021 IRP, 2021 RFP, or the 2023 IRP Electric Progress Report; as previously noted.

Power Price Forecasts

PSE uses the Aurora model and the WECC-wide database developed by Energy Exemplar to forecast the Mid-C power prices. A description of this methodology is provided in the forecast update memo as part of PSE's 2023 IRP Electric Progress Report process[3]. PSE used forecast Mid-C market prices from the draft 2023 IRP Electric Progress Report for Phase 2 analysis.

Natural Gas Price Forecasts

The RFP gas price forecast uses forward markets in the near term estimates of cost. For long-term forecasts, Wood Mackenzie long-term fundamentals gas prices were used, consistent with PSE's IRP

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[3] 2023 IRP Forecast Memo https://www.pse.com/-/media/PDFs/IRP/2022/09132022/2022-0913-ElectricPriceForecast.pdf?sc_lang=en&modified=20220906180240&hash=C69F085635A90B5DF6BF9D94D1B5D7CA

approach. The gas price forecast for RFP Phase 2 used forward markets through 2029 and then Wood Mackenzie long-term fundamentals gas price forecasts through 2045.

Load forecasts

PSE used the F2022 load forecast which factored in a climate change assumption and adjusted for conservation in its Phase 2 analysis. As shown below in Figure 5, the F2022 load forecast, which includes the impact of climate change, results in a slightly higher energy forecast and much higher summer peaks.

Carbon price forecasts

The carbon price forecasts used in the 2021 RFP are consistent with those used for the 2023 IRP Progress Report, which includes the social cost of carbon (SCC)[4] and the Climate Commitment Act's (CCA)[5] carbon price. The SCC assumption was similar from the 2021 IRP to the 2023 IRP while the CCA cost is new in the 2023 IRP. The social cost of carbon was implemented in a manner consistent with PSE's IRP and in compliance with CETA's requirement that "an electric utility must incorporate the social cost of greenhouse gas emissions as a cost adder when evaluating and selecting intermediate term and long-term resource options." The Climate Commitment Act carbon price was included in the dispatch assumptions for thermal resources and market purchases.

Generic resource cost assumptions

Generic resource capital costs are updated biennially as part of PSE's Integrated Resource Planning process. The generic resource capital cost assumptions used in Phase 1 and Phase 2 of the 2021 RFP were developed for the 2021 Integrated Resource Plan ("IRP") and used in the 2021 IRP Preferred Portfolio analysis. At the time the 2021 RFP Phase 2 analysis was conducted, 2023 IRP Progress Report cost assumptions were being developed and finalized, therefore those cost assumptions had not yet been incorporated into the models. Table 4 presents the generic resource costs (measured in dollar per KW) assumed in the 2021 RFP.

Table 4 2021 RFP generic resource costs

Resource type	Capital cost* (2020$)	Resource type	Capital cost* (2020$)
Offshore Wind	$5,658	Battery, LI 2hr	$1,149
Wind, WA	$1,868	Battery, LI 4hr	$2,032
Wind, MT	$1,864	Wind + Battery, WA	$2,715
Wind, ID/WY	$1,864	Solar + Battery, WA	$2,588
Solar, WA	$1,727	Frame Peaker	$1,003
Solar, ID/WY	$1,727	CCCT	$1,309
Solar, DER (Residential)	$3,772	Reciprocating Peaker	$1,769
Biomass	$7,396	Battery (4hr, Flow)	$2,682
PHES, WA/OR	$2,791	Battery (6hr, Flow)	$3,714
PHES, MT	$2,791		

[5] https://apps.ecology.wa.gov/publications/documents/2202015.pdf

Planning reserve margin and electric load carrying capability assumptions

PSE hired consultant, Energy and Environmental Economics, Inc. ("E3") to perform a seasonal resource adequacy analysis for its 2023 IRP Progress Report for the two study year 2029 and 2034 using different climate change model scenarios. The 2021 IRP modeled the annual planning reserve margin ("PRM") while the 2023 IRP Progress Report modeled the seasonal PRM.

Effective load carrying capability ("ELCC") is an approach that compares the relative peak capacity contribution of resources with different operating characteristics. The ELCC, or peak capacity benefit, is defined as the relative contribution of a resource towards meeting a utility's peak capacity need compared against that of a gas-fired peaking plant with an equivalent nameplate capacity. Because ELCC values are highly dependent on the load characteristics and mix of resources owned by a utility, they are unique to each utility.

In Phase 2, PSE applied resource-specific ELCCs developed by E3 when applicable and available. For on-system storage resources, E3 provided ELCC values for those resources by clustering storage resources into distinct tranches. As the forecasted amount of on-system storage fell within the first three tranches, PSE utilized an average of the first three tranches for the generic values for 2-hr and 4-hr storage values from E3. PSE also utilized the E3 provided generic thermal, pumped storage, and Li-ion Battery (6-hour) values as provided for those resources as applicable.

ELCC values for Phase 2 were calculated on a seasonable basis (previously, values were calculated on an annual basis). Storage and hybrid ELCCs increased significantly. Solar ELCCs in summer increased over annual ELCC values. Lower Washington wind values reflect increased saturation. In general, resource-specific ELCC values moved similarly to their generic counterparts. Table 5 below shows how the generic ELCC's were changed between Phase 1 and Phase 2 of the RFP.

Table 5 Comparison of RFP Phase 1 and Phase 2 (2023 IRP Progress Report) ELCC values

Hat Resource Type	Resource Name	2023 IRP / RFP Phase 2		RFP Phase 1 (as filed)	
		2029	2029	2027	2031
		Winter	Summer	All	All
Thermals	Frame Turbine	96%	98%	100%	100%
Storage	Li-ion Battery (2-hour)	54%	63%	12%	16%
	Li-ion Battery (4-hour)	93%	94%	25%	30%
	Flow – 6 hr / Li-ion Battery (6 hr)	98%	98%	30%	36%
	Pumped Storage (8-hour)	99%	99%	37%	44%
Hybrids	Solar + Storage	51%	87%	14%	14%
	Wind + Storage	61%	53%	24%	24%
	Solar+Wind + Storage	33%	54%	N/A	N/A
Stand Alone	Montana Central Wind	39%	27%	30%	30%
	Montana East Wind	32%	19%	22%	22%
	Washington Wind	13%	5%	18%	18%
	Washington East Solar	4%	55%	4%	4%

Flexibility value

The flexibility value quantifies the sub-hourly benefits of adding a generation asset to the PSE system. These benefits, which apply to dispatchable resources such as thermal plants, pumped hydro and battery energy storage resources, include: flexibility up and down, voltage regulation, spinning and non-spinning reserves. Please note that while the Aurora model accounted for the flexibility benefits of generic resources, the flexibility benefits of existing PSE resources were not explicitly modeled as they are deemed inherent to PSE's existing portfolio.

Because the 2023 IRP Progress Report flexibility analysis was still underway at the time the 2021 RFP Phase 2 evaluation was conducted, both phases of the RFP evaluation used the 2021 IRP generic resource assumptions. Table 6 presents the flexibility benefit value assumptions used in the 2021 RFP.

Table 6 2021 RFP flexibility benefit value assumptions (2021 IRP)[6]

Resource	Flexibility Cost Savings ($/kw-yr)
CCCT	$5.27
Frame Peaker	$23.45
Recip Peaker	$25.39
Lithium-ion Battery 2hr	$20.45
Lithium-ion Battery 4hr	$18.45
Flow Battery 4hr	$23.03
Flow Battery 6hr	$23.24
Pumped Storage Hydro 8hr	$18.41
Demand Response	$35.24

Resource analyzer results summary and generic costs updates

Due to the timing of this resource decision, PSE was not be able to update the Phase 2 Aurora model to reflect the generic resource costs being considered in the 2023 Progress Report. To reflect the impacts of the low end generic resource cost assumptions of 2023 Progress Report, PSE used Resource Analyzer, an Excel based revenue requirement model. The analysis focused on comparing the revenue requirements of renewing the PSA against two replacement scenarios. The Optimized Portfolio scenario replaces the PSA with a resource build based on the replacement portfolio selected by Aurora. The second scenario, the Wind and Peaker scenario, replaces the PSA with a much simpler resource build using only generic wind and generic Peakers.

1) **Optimized Portfolio Scenario** – In the optimized portfolio scenario, PSE compared the revenue requirement of replacing the 25% share of the energy and capacity output of the Projects with the resource mix selected Aurora. This analysis supplements the Aurora-based optimization analysis by updating generic costs and focusing on revenue requirements, as opposed to total portfolio costs reported by Aurora. The replacement portfolio consists of:
    - 237 MW of Peakers
    - 50 MW of Li Ion 4-Hr Battery Energy Storage
    - 300 MW of Eastern WA Solar
    - 400 MW of WY wind
2) **Wind and Peaker Scenario** – In the wind and peaker scenario, PSE compared the revenue requirement of replacing the output from the Projects with 634 MW of wind resources and

[6] *Source: PSE's 2021 Integrated Resource Plan ("IRP"), Figure 5-17: Sub-hourly System Flexibility Cost Savings table. See also Appendix G, Electric Analysis Models, for a detailed description of the methodology used to develop the flexibility benefit.*

358 MW of peaking resources. Together, these resources represent a portfolio of replacement resources necessary to replace the 25% share of the energy and capacity output of the Projects.

Table 7 below shows the net present value ("NPV") of the results in both 2022 and 2031 dollars. It also shows the levelized costs of the energy over the PSA life. Table 8 compares the 2021 IRP and 2023 Progress Report generic cost assumptions for the resources used in the analysis. This analysis supports that renewing the PSA is lower cost than a portfolio with generic resources.

Table 7 Summary of Resource Analyzer results

Resource Analyzer Scenarios	NPV Costs (2022 $000)	NPV Costs (2031 $000)	Levelized $/MWh
Chelan PUD PSA	$		
AURORA optimization scenario	$		
Wind and peaker scenario	$		

Table 8 Comparison of selected generic resources

Resource Type (2020$)	2021 IRP	2023 Progress Report
Battery, LI 4hr	$ 2,032	$ 1,314
Frame Peaker	$ 1,003	$ 944
Solar, WA	$ 1,727	$ 1,230
Wind WA	$ 1,864	$ 1,464
Wind WY	$ 1,864	$ 1,772

Bottoms up/Market Valuation Analysis

As an additional comparison, PSE estimated the value of the PSA using a "bottoms up" approach that estimated market values of underlying benefit streams associated with the output. The PSA identifies three value streams, or components, for purposes of replacement cost and margining calculations—energy, capacity, and environmental attributes. This methodology is similar to the valuation methodology used by PSE to bid into and win competitive market sales in 2021. PSE compared the costs of the PSA under three different scenarios which are described below.

Scenario 1 – this scenario values the three value components based on the assumptions used during contract negotiations in in September. The assumptions and methodologies will be fully described in the PSA as well as the Collateral Annex to the PSA. The descriptions below are consistent with the assumptions and methodologies considered during contract negotiations.

Scenario 2 – this scenario uses alternate forecasts for the market valuations as described below.

- Energy – Based on the 2023 Progress Report "Mid" forecast.
- Capacity – For the purposes of the PSA margining calculation, PSE was able to negotiate a $20 per MWh price.
- Environmental Attribute – The environmental attributes are based on a forecast of carbon allowances published be the Washington Department of Ecology. PSE used the "Floor" forecast which represents the lowest forecast price forecast.

Scenario 3 – In this scenario PSE created a proxy resource based on the average costs of resources selected as part of the 2021 RFP shortlist.

- Energy – PSE calculated the average levelized cost of energy for the shortlist resources.
- Capacity – Levelized capacity price of shortlist resources adjusted to the capacity provided by the PSA.
- Environmental Attribute – The energy resources in the shortlist are all renewable or CETA eligible resources, for this reason PSE did not need to include an additional adder.

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All-Source RFP Phase 2 Results

EMC Informational

October 27, 2022

Colin Crowley
Manager Resource Acquisition

PUGET SOUND ENERGY

Highly Confidential

Updates since last EMC update on Sep 30

- Combined short list between All-source RFP and DER RFP
- Equity sensitivity scenario
- Reconciliation with independent evaluator

Evolution of resource need from the 2021 IRP (basis for the approved RFP) to the 2023 IRP progress update (work in progress)

Capacity need in 2027

- Draft 2023 Integrated Resource Plan ("IRP") progress update shows peak need of ~750MW

	2021 approved RFP[1]	2023 IRP update (draft)[2]
Peak capacity – winter	527 MW	~ 750 MW
Peak capacity – summer	n/a	~ 1,000 MW

- Market reliance reduction anticipated to be addressed through short to intermediate term bridge agreements. (Example: Mid-C Hydro contracts, etc.)

CETA need in 2025-26

	2021 approved RFP	2021 filed CEIP[3]
CETA need	1.669 TWh in 2026	1.886 TWh in 2025

[1] Capacity need in 2021-approved RFP is based on the 2021 IRP and is addressing peak capacity need by 2027.
[2] Conservation numbers for the 2023 IRP Update are still being developed, so the 750 MW is calculated for the RFP using 2021 IRP conservation as a proxy. The 750 MW and 1,000 MW is subject to change and will be finalized once IRP team completes their work.
[3] At the time the RFP Phase 2 analysis was conducted, the CETA need for the 2023 IRP update was still being developed. CETA need in RFP Phase 2 is 2.625 TWh in 2026, which is based on the need forecast used in the 2021 CEIP. Note that the filed CEIP only presents the need through 2025.

[redacted]

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2021 All-Source RFP short list by resource type

Results subject to change in negotiations

Technology	Nameplate (MW)
Capacity resources	
Battery storage (standalone)	500
Pumped hydro storage	100
Subtotal capacity	600
Clean energy	
Wind - standalone	186
Solar - standalone	601
Hybrid – Solar + storage	450
Hydro (run of river)	22
Subtotal renewable	1,259
Total All-Source RFP resource addition [1]	**1,859**
Peak contribution in 2027 Aug [2]	1,204 MW
Peak contribution in 2027 Dec [2]	657 MW
CETA contribution in 2025	1,537,681 MWh
CETA contribution in 2026	2,802,813 MWh

- Pumped hydro storage resource reduces overall BESS selections compared to previous results
- Outside the RFP, the Grant hydro meaningful priority contributes another ~380,000 MWh to CEIP target in 2025
- Current All-Source RFP short list additions exceeds CEIP target of 2.625 TWh in 2026
- All-Source RFP backup list provides additional resources to meet potential adjustments to need

[1] In addition to All-Source RFP resources, DER RFP selected 157MW of DER resources. See combined short list for All-Source RFP and DER RFP on next slide.
[2] In addition to All-Source RFP resources, DER resources contribute additional 137MW and 93MW for 2027 Aug and 2027 Dec, respectively. See next slides for details on peak contribution for both All-Source RFP resources and DER resources.

Combined short list between All-Source RFP and DER RFP

Results subject to change in negotiations

All-Source RFP Short List

Line	COD	Resource Type	Offer ID	Project Name	Term (Years)	Begin Year	Offer Capacity (MW)	Peak Contribution 2027_08 (MW)	Peak Contribution 2027_12 (MW)	CETA Contribution 2025 (MWh)	CETA Contribution 2026 (MWh)
1	12/1/2024	SOLAR	7621	[redacted]	20	2024	[redacted]				
2	12/31/2024	SOLAR	8652		25	2024					
3	12/31/2024	SOLAR	9015		20	2024					
4	12/31/2024	SOLAR	2899		25	2024					
5	3/9/2025	HYDRO	5438		20	2025					
6	10/5/2025	WIND	1573		15	2025					
7	10/31/2025	BESS	7418		20	2025					
8	12/1/2025	WIND	2958		25	2025					
9	12/1/2025	Hybrid/Solar	1627		20	2025					
10	12/1/2025	Hybrid/BESS	1627		20	2025					
11	12/1/2025	BESS	5684		20	2025					
12	10/31/2026	BESS	9851		20	2026					
13	12/31/2026	PSH	1810		30	2026					
14	**DER RFP Short List**					**All-Source RFP Total**	**1,859**	**1,204**	**657**	**1,537,681**	**2,802,813**
15	1/1/2023	DER	8918	[redacted]	5	2023	[redacted]				
16	1/1/2023	DER	5247		5	2023					
17	1/1/2023	DER	1714		5	2023					
18						**DER RFP Total**	**157**	**137**	**93**		
						Combined Total	**2,016**	**1,341**	**750**	**1,537,681**	**2,802,813**

[1] Further due diligence necessary to determine feasibility of shared transmission by multiple Montana resources.
[2] DER RFP short list resources include all feasible DER proposals at this time. For details about the DER RFP evaluation process and results, see DER RFP Phase 2 Results presentation presented to the EMC on October 27, 2022.
[3] All three selected DER programs were bid with 5-year contract terms, but will have extension provisions based on performance, pricing and other metrics. PSE assumed contract renewal and modeled these 5-year DER contracts for 30 years, consistent with demand response modeling methodologies used in PSE's 2021 IRP and 2022 CEIP.

*Project summaries are included in pre-read material for All-Source RFP short list proposals.

[redacted]

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Recommended portfolio is the lowest reasonable cost portfolio based on a combination of modeling results and risk assessment

- Recommended portfolio reflects Aurora optimized portfolio when resources with substantial material commercial risks are removed from the selection pool

	Unconstrained Aurora optimization results	Adjustments for substantial material commercial risk(s)*	Recommended portfolio Lowest reasonable cost portfolio
	Portfolio selected based on optimization results (before adjustments for excessive commercial risks)	[redacted]	Portfolio selected based on optimization results combined with commercial risk assessment
Total portfolio cost	**$18,007 MM**		**$18,219 MM**

*See Appendix A for a summary of the Phase 2 commercial risk assessment.

[redacted]

Proposals recommended to back up short list projects

Line	Proposals / Offers to backup shortlist*			
	ID	Proposal Name	Highlights	Purpose
1	4101	[redacted]		
2	9696			
3	1413			
4	3971/ 4091			
5	7508			

*Proposal summaries are included in pre-read material for backup proposals.

[redacted]

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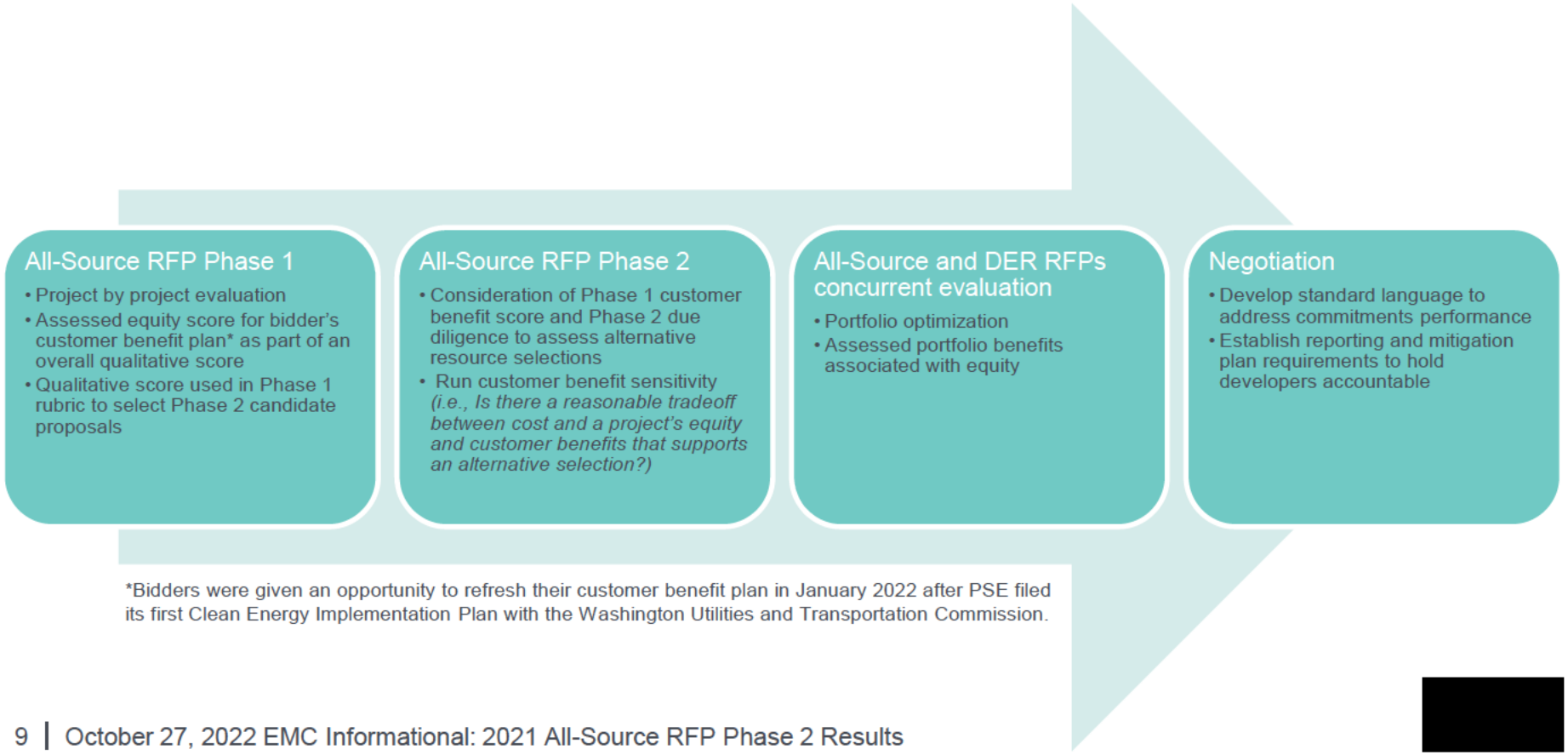
Cleaner, more reliable generation portfolio results in higher power cost

Line		Power costs ($in millions) 2025	2026	2027
1	2023 5-year Plan	$ 1,160	$ 1,185	$ 1,235
2	Baseline power costs (no new resources)	$ 1,063	$ 1,039	$ 1,033
3	Short List RFP resources	$ 1,082	$ 1,115	$ 1,160
	Incremental change (relative to baseline)			
4	Short List RFP resources	$ 19	$ 76	$ 128

[redacted]

Spotlight on customer benefit provisions in each All-Source RFP phase



*Bidders were given an opportunity to refresh their customer benefit plan in January 2022 after PSE filed its first Clean Energy Implementation Plan with the Washington Utilities and Transportation Commission.

[redacted]

A portfolio sensitivity aimed at maximizing equity/customer benefits resulted in a $126 million portfolio cost increase versus the base case

- PSE Resource Acquisition and SMEs from the Clean Energy team reviewed the Phase 1 customer benefit findings, incorporating Phase 2 due diligence to date
- Based on this review, proposals with higher potential customer benefit/equity contributions (corresponding to Phase 1 scores of 2 or higher) formed the pool of available resources for this modelling sensitivity:
  - 11 BESS (1,875 MW)
  - 3 biodiesel (643 MW)
  - 3 wind (458 MW)
  - 3 standalone solar (550 MW)
  - 2 solar hybrid (300 MW)
- The 3 shortlisted DERs were also included in the resource pool for the equity/customer benefit sensitivity as “must take” resources

- The results show that the equity/customer benefit sensitivity produces a NPV portfolio cost ~ $126 million higher than the base case
- The resulting portfolio includes 5 proposals that are already on the base case short list
- The sensitivity included four proposals that are not in the base case: [redacted] (#1413), [redacted] (#9374), [redacted] BESS (#4101) and [redacted] BESS (#5435)
- [redacted] and [redacted]r BESS are included in the backup list
- After review with the independent evaluator, PSE concluded the higher portfolio costs of the sensitivity were not offset by any clear quantifiable increase in customer benefits

* See appendix for proposal list for this sensitivity.

[redacted]

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RFP checklist to reach final resource selections

Commercial and administrative

- ✓ Review and reconcile with Bates White proposals that present excessive risk
- ✓ Work with clean energy team to optimize equity/customer benefits
- Work with internal teams to finalize key terms to include in power purchase agreements
- Work with short list and backup bidders to review qualitative risks and finalize commercial terms

Quantitative modeling updates

- ✓ Turn off excessive risk proposals reconciled with Bates White
- ✓ Finalize All-Source RFP shortlist through optimization that includes DER selections
- ✓ Model sensitivities to validate recommended shortlist and backup projects

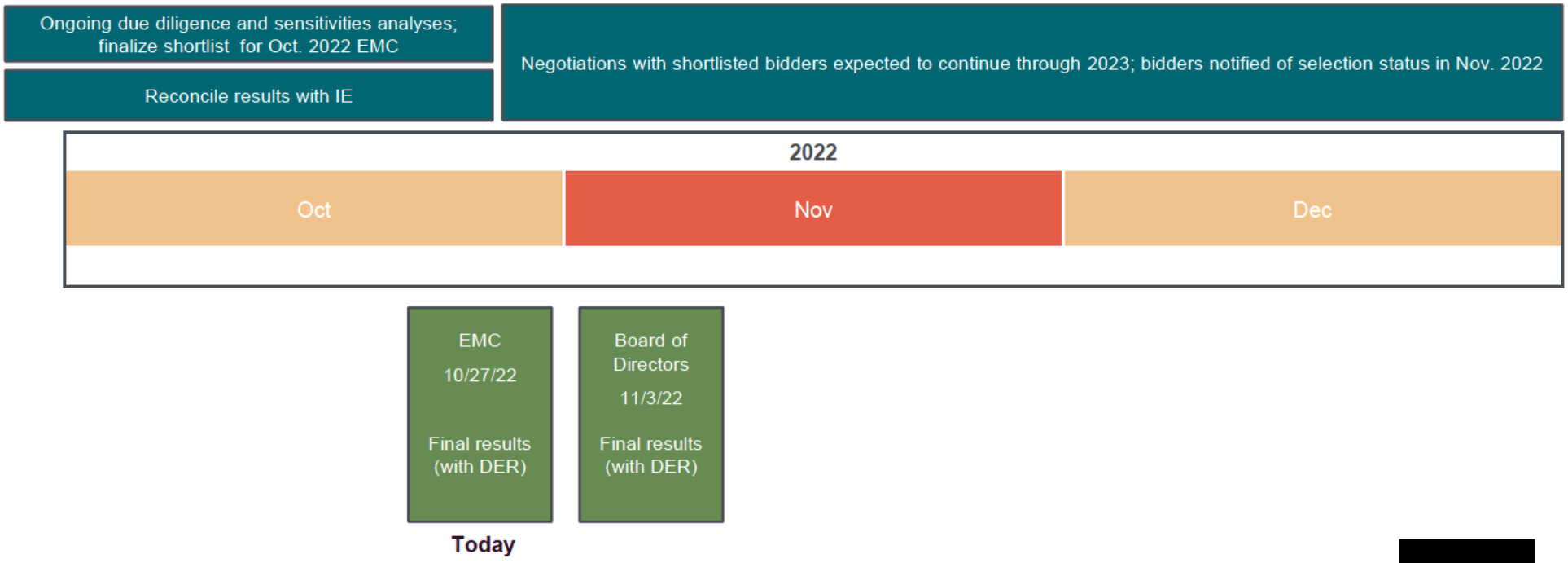
3rd party and internal analysis beyond October EMC

- E3 backend portfolio resource adequacy modeling
- Guidehouse final flow study
- DNV energy assessments and curtailment analysis
- Power cost analysis and stochastic risk analysis for VERs
- Determine approach for implementing battery charging on PSE's system (e.g., network load or transmission service)

[redacted]

Phase 2 next steps

PSE is on track to notify bidders of their selection status and commence negotiation discussions in November.



[redacted]

Chelan Power Sales Agreement Renewal

EMC Informational

September 30, 2022

Eric Kang
Senior Commercial Development Manager

Zac Yanez
Commercial Acquisition Manager

Anticipated Recommendation: Finalize Terms and Prepare Package for Board Approval

- Resource Acquisitions recommends that the EMC prepare a board package and seek approval from the Board of Directors (BOD) a 2031 renewal of the Chelan Power Sales Agreement ("PSA"). Chelan is holding their pricing through Mid-November.

- Draft Key Terms:
  - **Term:** Nov 2031 – Oct 2051
  - **Product:** 25% Slice of Chelan's Rocky Reach and Rock Island hydro projects
    - ~ 444 MW Capacity
    - Over 2,000 GWh of Clean (CETA) Energy
  - **Price:** PSE would be responsible for 25% share of the projects' cost + a fixed annual payment
    - $____/MWh - Based on Chelan cost forecasts
      - $____/MWh (cost of production) + $____/MWh (fixed annual adder)
  -

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Chelan PSA background and negotiation status

- PSE has long history with the Rocky Reach and Rock Island hydro projects. The current contract was executed in 2006 and became effective in 2011 and 2012 and expires at the end of October 2031
- Contract was priced as cost of production plus a one time $[redacted] MM Capacity Reservation Charge
- Current CEIP and 2021 IRP assume that Chelan is extended past 2031, Chelan continues to provide capacity and clean energy throughout these studies.
  - 2021 IRP identified 7,633 CETA need in 2030.
- Under Current PSA PSE has a 25% share of the hydro projects
  - Capacity: 444 MW
  - Energy: over 2,000 GWh per year (or ~26% of 2030 need above)
  - In August 2022, PSE and Chelan amended PSA so that PSE receives the environmental attributes associated with the projects
- In 2021, Chelan and PSE began discussions on contract terms and pricing of a contract renewal
  - Chelan and Avista agreed to a contract in December 2021 (5% 2026 – 2030, 10% 2031 – 2045)
  - Chelan has offered PSE consistent terms and has held the price (~[redacted]/MWh) originally proposed in Aug 2021

[redacted]

Preliminary analysis shows ~$ /MWh price results in over $2,300MM in benefits relative to generic resources

- Chelan Pricing is estimated at ~ $ /MWh based on cost of production plus fixed annual charge
  - Cost of production: ~$ /MWh 2031 levelized
    $ MM in 2032 growing to $1 MM in 2050
  - Fixed annual costs: ~$ /MWh 2031 levelized
    $ MM in 2032 growing to $ MM in 2050
  - Present Value (2022) of cost estimate is ~$ MM

- Replacing the Chelan contract results in additional VER and Capacity builds by 2045
  - ~1,100 MW of Solar
  - ~200 MW of Wind
  - ~350 MW of BESS and a ~200 MW increase in peakers
  - Incremental costs of Portfolio are ~$2,300MM to ~$2,600MM with Social Cost of Carbon
  - Analysis was conducted using 2021 vintage Aurora model, to be updated using RFP model

PSE will continue to face hydro risk, relicensing risk, and Chelan is asking for [redacted]

- Rock Island license expires 12/31/2028, contract commits PSE to support relicensing effort
  - Chelan has begun studies and public participation as part of relicensing process
  - Plan to submit to FERC in 2025
  - Initial review by PSE SMEs, give confidence that Chelan has a good team working on solutions. Mostly expect the new license to be a continuation of current one. Potential issues include seismic improvements, fishery mitigations, and recreational improvement
- [redacted]

Next Steps and Timeline

- Complete legal review and finalize contract terms
- Attempt to get more reciprocal treatment in credit terms
- Update replacement analysis using RFP Aurora model
- October EMC Meeting - Return to EMC with final recommendation
- November BOD Meeting – Seek BOD approval to execute contract
- Mid to late November - Execute contract and renew Chelan PSA

[redacted]

Anticipated Recommendation: Finalize Terms and Prepare Package for Board Approval

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  - **Price:** PSE would be responsible for 25% share of the projects' cost + a fixed annual payment
    - $____/MWh - Based on Chelan cost forecasts
      - $____/MWh (cost of production) + _____/MWh (fixed annual adder)
  - [redacted]

Chelan Contract Renewal Execution Request

EMC Decisional

January 5, 2023

Eric Kang
Sr Commercial Development Manager

Zac Yanez
Commercial Acquisition Manager

Request authorization to execute a 20-year power purchase agreement with Chelan PUD

Decisional: Based on resource needs, economic analysis, and consideration of risks and benefits, management requests that the board of directors authorize PSE to execute the 20-year contract renewal with Public Utility District #1 of Chelan County ("Chelan PUD").

Term: Nov 2031 – Oct 2051

Product: 25% "Slice", or share, of Chelan's Rocky Reach and Rock Island hydroelectric projects:

- ~ 444 MW Capacity; and
- Over 2,000 GWh of Clean (CETA) Energy.

Price: PSE will be responsible for 25% share of the projects' cost of production + a fixed annual adder. Based on forecasted production and costs result in estimated per MWh costs of:

$ ____/MWh – Levelized total costs

- $____/MWh – Levelized cost of production
- $____/MWh – Levelized fixed annual adder

[redacted]

Chelan's hydro projects have been a central part of PSE supply portfolio since their creation.

- PSE's interest in the Rock Island and Rocky Reach hydro projects ("the Projects") began when they first entered service in 1933 and 1961, respectively. Prior to the current contract, which was executed in 2006, PSE had as much as 43% share (830 MW) of the Projects output.
- Current contract summary:

  Term – The current contract took effect in 2011 and 2012. Contract will expire in October 2031, with **no right of first refusal or roll-over rights**.

  Product – 25% slice of the Projects output, or ~444 MW of nameplate capacity and over 2,000 GWhs of energy per year.

  Price – A one-time initial reservation payment of $_____ and 25% of the on-going production costs.

  Environmental Attributes - In August 2022, PSE and Chelan amended the PSA so that PSE would now receive the environmental attributes associated with the projects

- In 2021, Chelan began contract renewal discussions with PSE
  - Chelan and Avista agreed to a similar contract in December 2021 (5% slice growing to 10%).
  - In spite of recent shifts in NW energy markets, Chelan has maintained consistent terms and has not materially change the price (~$__/MWh) originally proposed in Aug 2021.

New contract terms are mostly consistent with existing contract.

Pricing terms consistent with current contract with two exceptions:

- Fixed annual price adder, please see table in appendix slide.
- Transmission payment tied to published OATT rate.

Transmission Service is now based on Chelan's OATT.

Chelan has placed a 4,350 limit on the number of physical unit starts PSE may cause in a rolling 24-month period.

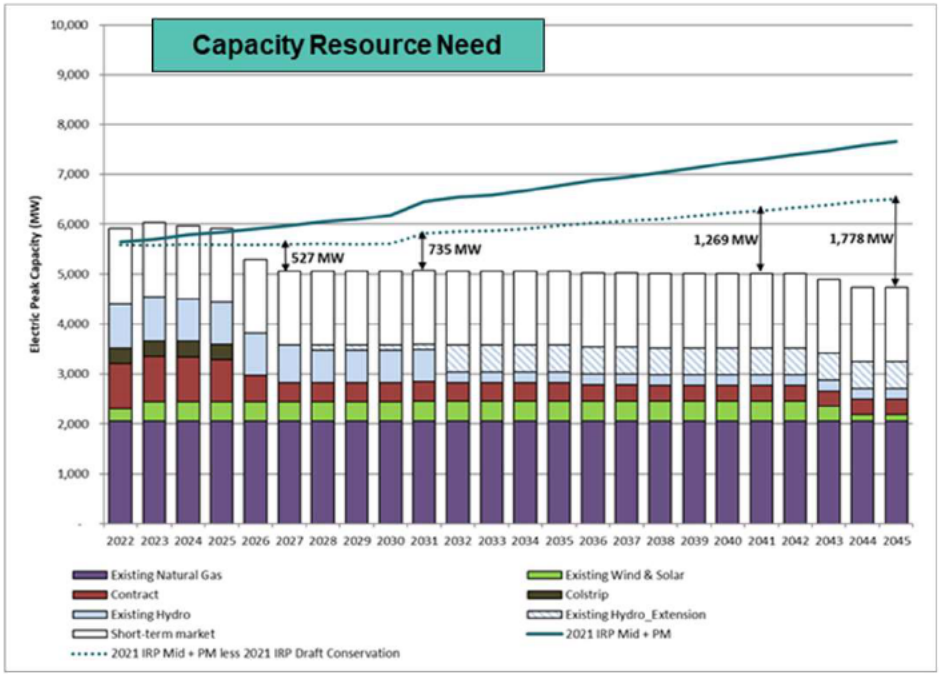
- The physical start limit is based on the mechanical limits of the generating units, does not appear to be overly restrictive based on historic observation.

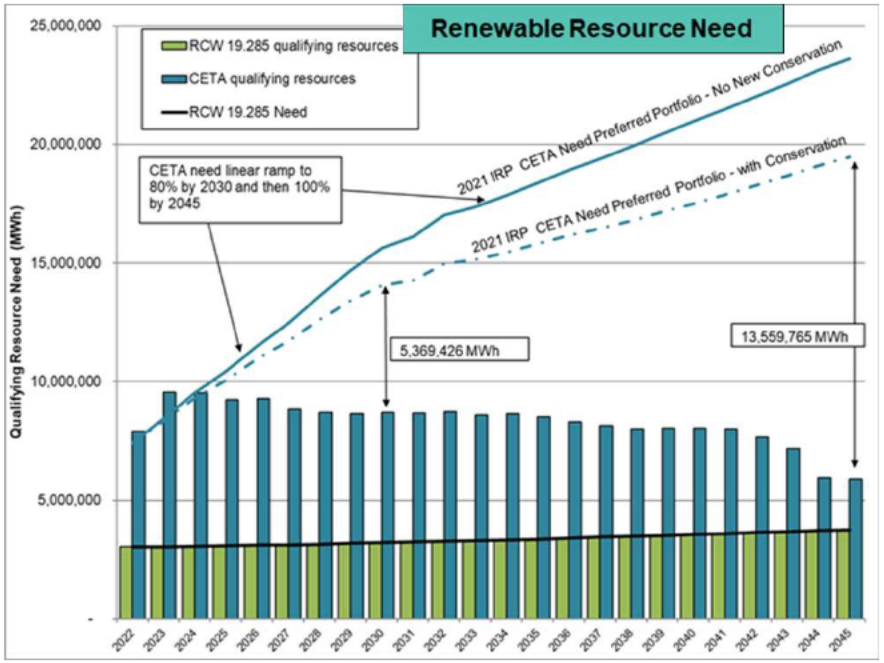
As discussed in the risk section and the appendix slides, Chelan is requesting Credit and Performance Support.

[redacted]

Growing need for capacity and renewable resources reinforce the importance of Chelan Contract Renewal to PSE.

- PSE's 2021 IRP showed a substantial resource need despite assuming the Chelan contract would be renewed.
- PSE is currently finalizing the 2023 IRP progress report, preliminary indications are the Capacity and Renewable needs are increasing.
- Renewing the Chelan contract secures 444 MW of capacity and over 2,000 GWH of renewable energy through October 2052.





Renewing the Chelan contract is lower cost relative to comparable portfolios and provide qualitative benefits.

Resource Alternatives	2031 NPV Costs ($000)	Levelized $/MWh
Chelan Renewal	$	$ /MWh
2021 RFP Phase 2 AURORA incremental costs	$	$ /MWh
Revenue Requirement Model – AURORA replacement	$	$ /MWh
Revenue Requirement Model – wind and peaker replacement	$	$ /MWh

In addition to substantial costs savings the Chelan Contract includes other benefits such as:

- Access to a 25% of the pondage behind the projects.
- The ability to dynamically schedule output, allowing the access to full flexibility of project.
- Historically used to carry operating reserves and helps balance and integrate variable energy resources.
- Commercially available project with a long operating history and a proven transmission solution.
- Projects have gone through major turbine modernization, Rock Island Powerhouse two expected to be completed in 2023.

[redacted]

PSE and Chelan PUD interests align to mitigate relicensing and operational risks.

Relicensing Risk - Rock Island license expires in 2028.

- Chelan PUD has started studies and will submit relicense application with FERC no later than December 2025.
- Review by PSE subject matter experts gives confidence that Chelan has a good team working on solutions. Expected to be a continuation of current license with seismic improvements, fishery mitigations, and recreational improvements.

Operational and Cost Risk

- PSE's share of project costs is equal to PSE's current share of output, 25%.
- Chelan will retain up to 65% of the Projects for load service or to market to third parties.
- It is in Chelan's best interest to maintain efficient and reliable output to control cost and minimize rate impacts for their own customers.

[redacted]

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$ /MWh – Levelized total costs

- $____/MWh – Levelized cost of production
- $____/MWh – Levelized fixed annual adder

[redacted]

Appendix

PSE's 25% share of Chelan's fixed annual charge.

Year	PSE's 25% share	Year	PSE's 25% share
2031	$	2041	$
2032	$	2042	$
2033	$	2043	$
2034	$	2044	$
2035	$	2045	$
2036	$	2046	$
2037	$	2047	$
2038	$	2048	$
2039	$	2049	$
2040	$	2050	$
		2051	$

[redacted]

PSE's bottoms up valuation based on component pricing.

$91.81 per MWH estimated value. The value is based on forecasted energy, carbon, and capacity prices.

- $58.05 per MWh – Levelized annual energy price.
- $13.76 per MWh – Holds Department of Ecology's "Floor" CCA forecast constant between 2031 and 2051.
- $20 per MWh – Holds a flat capacity payment of $98 per KW-year, represents a very competitive capacity price relative to current market conditions.

[redacted]

[redacted]