2020 Integrated Resource Plan
Public Workshop

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Items for Discussion

• What is the Integrated Resource Plan (IRP)?
• Key Risks
  • Load Risk
  • Environmental/Legislative Risk
  • Changing Power Market Risk
  • Resource Adequacy Risk
• IRP Modeling
• Initial Takeaways
• Action Plan
• Timeline/Next Steps
• Q&A
What is an Integrated Resource Plan (IRP)?

• Required by Washington State Law
  • RCW 19.280 - requires “electric utilities in Washington develop comprehensive resource plans that explain the mix of generation and demand-side resources they plan to use to meet their customers' electricity needs in both the short term and the long term.”
  • Filed with the State every 2-years by September 1st.

• An IRP is a comprehensive decision support tool and road map for meeting Grant PUD's objective of providing reliable and least-cost electric service to all of our customers while addressing the substantial risks and uncertainties inherent in the electric utility business.
IRP as a Planning Tool

• IRP is a planning tool used by staff to understand how best to meet our customer’s energy needs in the future

• Key principles used to meet these needs:
  • Maintain reliability of supply
  • Least cost
  • Identify conservation and efficiency opportunities
  • Understand the environmental impacts of resource choices

• IRP is a public process
  • Important to get our customers input
Identified Key Risks

• The key risks identified during IRP process:
  • Load Risk
  • Environmental/Legislative Risk
  • Changing Power Market Risk
  • Resource Supply Risk
  • Water Risk (and operational risk)
  • Transmission Risk

• Each key risk was considered in our IRP modeling
Load Risk

• Grant PUD has seen an impressive amount of load growth over the past 10-years
  • Annual growth rate of 3.1%
  • Majority from a few large industrial customers

• Load growth forecasted to continue over the next 10-years
  • Annual growth rate of 4.9%
  • Primarily from few existing large industrial customers

• Load growth with few large customers creates concentration risk
  • Risk of quick loss of load (existing or prospective new load)
  • Risk of rapid increase in load with new or existing large customers
Load Growth
Environmental/Legislative Risk

• 2020 passage of the Washington State Clean Energy Transformation Act (CETA)
  • Elimination of coal-sourced generation by 2025
  • Carbon-neutral generation by 2030
  • Greenhouse gas emission free by 2045
  • Rulemaking for CETA is still underway and final rules will not be known for several months

• Federal and State legislation concerning the environment is expected to continue.
Current I-937 (RPS) Requirements

- Grant PUD meets I-937 renewable portfolio obligations until 2025 in our Base Load Forecast
  - Renewable standard increased from 9% to 15% in 2020
  - Use existing gains from fish bypass at Wanapum and Priest
  - Using forecasted efficiency gains from turbine and generator replacements at Wanapum and Priest

- To meet needs starting in 2025, Grant PUD plans to use market purchase of eligible RECs to meet renewable standards and Solar Energy beginning in 2026
Changing Power Market Risk

• California Independent System Operator’s (CAISO) Energy Imbalance Market (EIM)
  • In 2020
    • Eleven current participants
  • By 2022
    • Additional ten participants
    • 82% of the loads in the Western Electricity Coordinating Council (WECC) will be participating in the EIM
    • Possible Extended Day-Ahead Market starting
  • This concentration of the load in the EIM may affect Mid-C (hourly and day-ahead) liquidity
Resource Adequacy Risk (RA)

• RA ensures that an electric utility has adequate resources available to serve load across a broad range of weather and system operating conditions

• As the region retires coal generation and discourages construction of carbon-emitting generation, the supply of dispatchable generation in the energy markets is expected to decrease

• Grant PUD annually purchases a significant amount of market power to meet our Estimated Unmet District Load (EUDL)

• Regional RA concerns impact the evaluation of the best method(s) of procuring power to ensure reliability of our system
IRP Modeling

• Looked at different scenarios that addressed key risk
  • A 15% planning margin was used
    • Safeguard against uncertainty (increased load or loss of generation)

• All the scenarios use the following assumptions:
  • Using current physical resources (PRP Avg. Water, QC/PEC, BPA Coulee, Slice Contracts)
  • 15% planning margin used for both energy and capacity needs
  • Firm physical resources used to meet expected load
    • Firm market purchases
    • Power Purchase Agreements (PPA)- solar and/or natural gas

• Base Case
  • Current medium load forecast (used in Financial Forecast)
  • Current environmental constraints
• Grant PUD engaged E3 to provide analytical support as part of development of its 2020 integrated resource plan (IRP)

• E3 was asked to find the least-cost portfolio needed to serve load growth within its service territory in the context of the broader Pacific Northwest clean energy policies

• E3 utilized its Pacific Northwest regional capacity expansion model, RESOLVE, to perform the analysis and determine the least-cost portfolio attributable to the new loads within the Grant PUD service territory
E3 RESOLVE Results Summary

• Results indicate solar is the marginal resource added for energy needs across all load scenarios

• Natural gas is the marginal resource added for capacity needs across all load scenarios
Scenario Runs

• Total of Four (4) Scenarios were analyzed
• Scenarios based on most recent load forecast
  • **Medium Low** Load Forecast
  • **Medium or BASE** Load Forecast
  • **Medium High** Load Forecast
  • **High** Load Forecast
• All four scenarios considered Clean Energy Transformation Act assumptions
Scenario Runs
Energy Positions – Annual

Annual Energy Position After EUDL - System Load

MW

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

Med Low Base Med Hi High
Base Case before - Annual
Base Case after - Annual

Annual Loads and Resources
BASE CASE - ADDED RESOURCES

Annual Average, MW

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

PRP Other Gen EUDL - Market Solar - PPA Combined Cycle - PPA Market System Load Load +15%
Base Case before – Summer Peak
Base Case after – Summer Peak

Average Summer Capacity
BASE CASE - ADDED RESOURCES

District Resource Peak Gen
EUDL Market HLH
Combined Cycle - PPA (HLH)
Energy Purchases
Peak Load
Solar - PPA
Gas Peak Plant - PPA
Peak Load +15%

MW

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

2000 1800 1600 1400 1200 1000 800 600 400 200 0
Current I-937 RPS Requirements – Base Case
Medium High Load before - Annual

Annual Loads and Resources
MEDIUM HIGH LOAD CASE

2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030
---|---|---|---|---|---|---|---|---|---|---
0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
---|---|---|---|---|---|---|---|---|---|---
PRP | Other Gen | EUDL - Market | System Load | Load +15%
---|---|---|---|---
600 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100
---|---|---|---|---
800 | 600 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100
---|---|---|---|---
1000 | 800 | 600 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100
---|---|---|---|---|---|---|---|---|---|---
1200 | 1000 | 800 | 600 | 400 | 200 | 100 | 100 | 100 | 100 | 100
---|---|---|---|---|---|---|---|---|---|---
1400 | 1200 | 1000 | 800 | 600 | 400 | 200 | 100 | 100 | 100 | 100
---|---|---|---|---|---|---|---|---|---|---
Medium High Load after- Annual

Annual Loads and Resources
MEDIUM HIGH LOAD CASE - ADDED RESOURCES

- PRP
- Other Gen
- EUOL - Market
- Solar - PPA
- Combined Cycle - PPA
- Market
- System Load
- Load +15%
Med High Load before– Summer Peak

Average Summer Capacity
MED HIGH CASE

MW

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

District Resource Peak Gen EUDL Market HLH Peak Load Peak Load +15%
Med High Load – **Summer Peak**

![Average Summer Capacity Graph](image)

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**MED HIGH CASE - ADDED RESOURCES**

- District Resource Peak Gen
- EUDL Market HLH
- Solar - PPA
- Combined Cycle - PPA (HLH)
- Energy Purchases
- Gas Peak Plant - PPA
- Peak Load

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**Average Summer Capacity**

- **MW**
  - 2020: 1000
  - 2021: 1000
  - 2022: 1000
  - 2023: 1000
  - 2024: 1000
  - 2025: 1000
  - 2026: 1000
  - 2027: 1000
  - 2028: 1000
  - 2029: 1000
  - 2030: 1000

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**Peak Load +15%**
Initial Takeaways

1. Based on the anticipated **annual** energy projections, Grant PUD has enough existing resources to meet expected load growth on an **annual basis** through 2028

2. As a result of the 15% planning margin, additional resource requirements are forecasted as soon as 2026

3. Grant PUD is forecasting to be seasonally capacity-deficit during Summer and Winter beginning in 2026

4. Grant PUD will continue to meet its renewable portfolio obligations without acquiring new resources until 2025. At that time Grant PUD will acquire any expected RPS deficits with market purchases of eligible RECs and is evaluating solar energy purchase power agreements to satisfy energy and RPS requirements
Initial Takeaways

5. Current Grant PUD EUDL Strategy of large market purchases needs to be reconsidered due to possible resource adequacy issues in the WECC

6. Grant PUD load forecast still contains significant uncertainty due to the relatively high percentage of industrial load

7. Grant PUD will need to stay abreast of changes in the utility industry affecting Grant PUD’s planning processes
Proposed Action Plan

- Immediately assemble a team of internal subject matter experts (SME) to determine strategy and execute a plan to research the acquisition of resources to meet forecasted energy and capacity needs
  - Leadership team has been identified
  - Work is being done to identify resources needed to perform extensive analysis for long-term resource needs
  - Preference needs to be given to a firm resource (less reliance on market purchases) to meet capacity/energy needs
  - Team will monitor opportunities to procure low-cost, long-term generating resources particularly resources that qualify for I-937 and CETA compliance
- Continue to implement and achieve cost-effective conservation
Proposed Action Plan

• Continue to refine and improve the retail energy load forecasts, with an emphasis on monitoring changes from the large industrial customers

• Evaluate the opportunities presented by the expansion of the Northwest EIM and/or possible growth of a Regional Transmission Organization (RTO) / Independent System Operator (ISO)

• Continue to participate in regional utility groups that monitor and influence legislation that could affect Grant PUD’s ratepayers
IRP Timeline and Next Steps

• **June 23** – IRP Public Workshop (today)

• **July 28** – IRP Public Hearing presented at Commission Meeting

• **August 25** – Commission action to approve IRP by Resolution

• **September 1** – Deadline to file with State of Washington
Questions?