2022 BPA Resource Program

High Policy Scenario

August 9, 2022
Agenda

• High Policy Scenario Assumptions

• Portfolio Optimization Results (aka Resource Solutions)

• Next Steps
High Policy Scenario
Assumptions and Inputs
Base vs. High Policy Scenario

Base
Our expected outcome *given:*  
• Assumed technology costs and availability  
• Base case gas prices, loads, and hydro (30 Water Year CRSO EIS)  
• Current, explicit carbon policy  
• Current behavior when clean policy is confronted with reliability shortcomings  
• Represents a more conservative estimate of how rapidly the system transitions to zero emission resources  
  – More responsive to short-term economics and reliant on traditional resources to meet reliability

High Policy
Our expected outcome *given:*  
• Rapid transition / Accelerated decarbonization  
  – CA carbon price in OR and WA  
  – WECC-wide carbon price beginning 2030  
  – All base case goals are accelerated  
  – All states aim for 100% Zero Emissions (ZEM) by 2050  
• Reduced solar, wind, and storage resource costs  
• More electrification in loads  
• 30WY CRSO EIS hydro  
• Lower gas price forecast  
• Represents a ‘plausibly high’ case, not intended to be a rigorous study of how or if the WECC achieves zero / net zero emissions, or how quickly it could do so
Renewable Portfolio Standard and ZEM requirements were updated to be consistent with Council’s ~June 2020 WECC policy survey (including municipal and utility clean goals, ‘pseudo goals’)

- We discount pseudo goals by 20%
- For all targets, we allow 10% of incremental needs to be met on a pooled basis (anywhere in the WECC)
Carbon Policy Constraints

Carbon prices:
- Base: CA and AB
- High Policy: CA/OR/WA adopt CA price, rest of WECC adopts lower price beginning 2030

Include emission penalties on WA thermals after 2030 and ensure 80% of WA loads are met with zero emission generation, ramping up to 100%

Include OR CO2 emission caps
HLH Obligations – Base vs. High

High Policy Loads

Base Case Loads

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High Policy Load Growth Assumptions

• 0.4% average annual load growth difference over 30WY base-case
  – Excludes growth in large new loads
  – 0.7% annual average growth rate for base and 1.15% for high policy

• High Policy Load Forecast Drivers
  – Slightly higher economic conditions would resume in late 2022 into early 2023 then continue.
  – Increased penetration rates for emerging electro technologies like electric vehicles, solar rooftop installations, etc.
  – Increase penetration of electric equipment over other fuel types due to mandates.
  – Other speculative loads would start up due to economic conditions and increasing growth in the Northwest.
  – No change in customer base post 2028.
High Policy Resource Assumptions

- Lower cost forecasts for renewable generation resources

- More renewable generation in WECC-wide buildout → lower average market prices vs. base
  - Base Case study average $22.83, High Policy study average $16.53 (2020 $/MWh)
  - Base Case, 2027: January HLH $38.04; October HLH $37.15 (nominal $/MWh)
  - High Policy, 2027: January HLH $28.61; October HLH $35.70 (nominal $/MWh)

- Limitations:
  - EE and DR capacities are not adjusted for higher regional loads
  - Market Purchase Limit study is same as Base Case
p10 HLH Needs – Base vs. High

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2025 Needs vs. Market Purchase Limit

2025 p10 HLH Needs with 2020-2023 EEI vs Market Purchase Limits

- Market Purchase Limit
- p10 Needs with '20-'23 EEI

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2024-2033 Needs vs. Market Purchase Limit
Portfolio Optimization Refresher
Refresher: Portfolio Optimization

- **Step 1:** Find Portfolio 1, the “least-COST” mix of resources that meet P10 HLH Energy needs and don’t violate Market Purchase Limit

- **Step 2:** Find Portfolio 40, the “least-RISK*” mix of resources that meet P10 HLH Energy needs and don’t violate Market Purchase Limit

- **Step 3-40:** Incrementally add budget to Portfolio 1’s budget value and remix resources to find risk minimizing combination at given budget level

*Risk is the variance in total portfolio cost across iterations, with expected resource costs and expected market prices causing most of the variance
Results
Resource Solutions Summary

- EE aMWs in High Policy show little change from 30WY Base
- Demand Response continues to be selected as a regularly deployed, low impact, low cost energy-related load management product
  - Adds industrial curtailment product to DR from base case
- Renewables are selected in the High Policy least-cost portfolio to meet modest growth to BPA’s load obligations
  - Small amounts of standalone solar photovoltaic, offshore wind
Resource Solutions
Resource Output
Balancing Priorities

- Power Plan: Achieving the Council’s target, prioritizing cost effective measures
- Resource Program: Acquiring savings with the greatest system benefit
- Customer Needs: Ensuring all customers can implement programs, supporting small, rural, and residential utilities
Next Steps

• **EE Action Plan**
  – Provides an operational plan for BPA to achieve its energy efficiency goals.
  – Bottoms up plan using Power Plan, Resource Program, customer needs, and market intelligence to create an operational roadmap.
  – Will guide BPA’s implementation efforts over the 2021 Power Plan period.
  – **Timeline**
    • Spring/Summer: Internal workshops and input gathering
    • Fall: Draft Action Plan
    • Winter: Publish draft Action Plan for comment
    • Spring: Final Action Plan published

• **Generating Resources**
  – Continue to evaluate these resources in the context of other ongoing initiatives (Provider of Choice and Western Resource Adequacy Program)
  – Continue to monitor actual resource costs and contract opportunities, as well as the pace of clean policies and rates of load growth