2021
BPA Needs Assessment

BPA Resource Program Public Workshop
May 24th, 2022
Agenda

• Overview of BPA’s 2022 Resource Program

• Review 2021 Needs Assessment
  • Assumptions, Method, Results

• Provide update on next steps
Background

- BPA began its Resource Program after the passage of the Pacific Northwest Electric Power Planning and Conservation Act in 1980 which established:
  - BPA’s authority to acquire resources on a long-term basis to assure an adequate supply of power to meet the Administrator’s contractual firm power obligations
  - Northwest Power & Conservation Council and the Council’s Power Plan

- The Resource Program examines uncertainty in loads, water supply, natural gas prices, and electricity market prices to develop a least-cost portfolio of resources that meet BPA's obligations.
BPA Resource Program Process

- Needs Assessment
  - End Use Load Forecast
  - Conservation Potential Assessment
  - Generation Resource Supply Curve

- Needs Assessment Metrics

- BPA Resource Forecast
  - Wholesale Market Price Forecast
  - Wholesale Market Reliance
  - DR & DER Supply Curve

- Optimization Process (including Economic Evaluation Methodology)

- Resource Solutions
BPA Generating Resource Portfolio

- **31 Federal Hydro Projects**
  - US Army Corps of Engineers (operator)
  - US Bureau of Reclamation (operator)
  - ~22,000 MW nameplate capacity

- **Columbia Generating Station**
  - Nuclear power plant near Richland, WA
  - Energy Northwest (operator)
  - ~1,169 MW capacity

- **Other**
  - Small amounts of wind and non-federal hydro
Needs Assessment Overview

- Needs Assessment (NA) forecasts Federal system energy and capacity surplus/deficit positions by assessing generating resources and load obligations for 2024 – 2033 without relying on wholesale power market.

- 2021 Needs Assessment relied on a new hourly hydro generation forecasting model:
  - Riverware
  - HYDSIM (Hydro System Simulator) is still our monthly hydro model; same model used by BPA and Council to run classic GENESYS.

- Studies include:
  - **Obligations** – new Frozen Efficiency Load Forecasts from BPA’s load forecasting group
  - **Resources** – hydro operations based on BP22 Final Rates Proposal (same as CRSO Final EIS Preferred Alternative)
    - Impacts of both 80 and more recent 30 years of historical streamflows modelled independently
Frozen Efficiency Load Forecasts

- Based on hybrid of Statistically Adjusted End-Use (SAE) implementation and econometric approaches.
  - BPA has over 135 firm regional power customers. Approximately 40 of those are modeled using SAE today and we continue to migrate customers into this evolving process established in 2018

- SAE Data Sources
  - Saturations – RBSA, Utility data
  - Efficiencies- Northwest Power & Conservation Council model results
  - UEC- Northwest Power & Conservation Council model results
  - Economic Data- IHS Markit
Frozen Efficiency Load Obligations
Needs Assessment Metrics

- **Annual Energy**
  - Evaluates the annual energy surplus/deficit under 1937-critical water conditions

- **P10 Superpeak**
  - Evaluates the 10\(^{th}\) percentile (P10) surplus/deficit over the six peak load hours per weekday by month, given variability in hydro generation

- **18-Hour Capacity**
  - Evaluates the ability to meet the six peak load hours per day over three-day extreme weather events assuming median water conditions

- **P10 Heavy Load Hour (HLH)**
  - Evaluates the P10 surplus/deficit over heavy load hours by month, given variability in hydro generation
Hydro updates including (CRSO PA) reduced 1937 annual generation by approximately 125 aMW
The larger deficits in odd years represent Columbia Generating Station maintenance/refueling outages
Large change between 2025 and 2026 is the expiration of a sales agreement to PGE
Updated hourly modeling includes pseudo-optimization of shaping the Lower Columbia projects to meet peak demand hours.

The largest deficits occur in the second half of April, followed by deficits across the winter (Dec/Jan) late in the study period.
18-hour Capacity

- Surpluses in Winter and Summer
- January was traditionally the constraining month, now that has changed to February
- February shows deficits in low water conditions
Riverware modeling results in reduced HLH-block in summer due to better alignment with river operations

Largest deficits occur in October, winter, and second half of April (aka April II)
30 years of historical streamflows results in more generation in winter and less generation in summer, compared to the 80 years of history.
Conclusion

- 2021 Needs Assessment results continue to demonstrate that BPA is energy (hydro fuel) limited
  - P10 Heavy Load Hour deficits are the most constraining results compared to the other metrics being evaluated

- More recent 30 years of historical streamflows results in more generation in winter and less generation in summer, compared to the 80 years of history

- For additional questions or details on the Resource Program please send an email to Communications@bpa.gov with the subject “2022 Resource Program”.