

Richard Devlin
Chair
Oregon

Chuck Sams
Oregon

Mike Milburn
Montana

Doug Grob
Montana



Northwest **Power and** **Conservation** Council

Guy Norman
Vice Chair
Washington

Patrick Oshie
Washington

Jim Yost
Idaho

Jeffery C. Allen
Idaho

June 2, 2021

MEMORANDUM

TO: Council Members

FROM: Ben Kujala

SUBJECT: Analyze the Bonneville Portfolio Scenario Findings

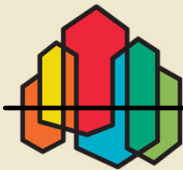
BACKGROUND:

Presenter: Ben Kujala

Summary: This scenario looks at the portfolio of Federal resources marketed by Bonneville and the forecast obligations that Bonneville will use these resources to meet. The scenario looks to optimize resource selection to meet the resulting needs and examines some of the risks that could alter the selection of resources.

Relevance: The Council is directed by the Act to make recommendations to the Bonneville Administrator about how much power to acquire and to the extent practicable, what types of resources that power should be acquired from. Understanding the federal portfolio and potential future needs is part of what informs those recommendations.

Analyze the Bonneville Portfolio Scenario Findings



THE 2021
NORTHWEST
POWER PLAN
FOR A SECURE & AFFORDABLE
ENERGY FUTURE

1

Analyze the Bonneville Portfolio



- What Resources are Required to Meet or Reduce the Administrator's Obligation?
- Portfolio costs are one factor of many that the Council will consider and balance as it formulates recommendations on amounts of power to acquire to the Bonneville Administrator
- Much of the information needed for this analysis we expect to be supplied under the existing December 2017 agreement on 4(c)(9) information sharing with Bonneville



THE 2021
NORTHWEST
POWER PLAN

2

2

What Resources are Required to Meet the Administrator's Obligation?

The Power Act states the plan is to include a “forecast of power resources estimated by the Council to be required to meet the [Bonneville] Administrator’s obligations and the portion of such obligations the Council determines can be met by resources in each of the priority categories.” This forecast “shall include the approximate amounts of power the Council recommends should be acquired by the [Bonneville] Administrator on a long-term basis and may include, to the extent practicable, an estimate of the types of resources from which such power should be acquired.”



3

Limitations of Portfolio Analysis

Portfolio costs are one factor of many that the Council will consider and balance as it formulates recommendations on amounts of power to acquire to the Bonneville Administrator. This scenario - and scenario and portfolio analysis in general - provides information for but does not determine the Council’s ultimate recommendations. Staff also recommends this scenario be considered comprehensively with the other scenarios and baseline analysis, not in isolation, before formulating any recommendations to be included in the plan.



4

Coordination with Bonneville

- Much of the information needed for this analysis we expect to be supplied under the existing December 2017 agreement on 4(c)(9) information sharing with Bonneville
- Coordination with Bonneville will be critical to both sufficiently define the parameters of the analysis and understand and vet scenario outputs



5

BPA Load Forecast

6

BPA Forecast in the Act

- The Act requires the plan include a “forecast of power resources estimated by the Council to be required to meet the [Bonneville] Administrator’s obligations and the portion of such obligations the Council determines can be met by resources in each of the priority categories.”
- This forecast “shall include the approximate amounts of power the Council recommends should be acquired by the [Bonneville] Administrator on a long-term basis and may include, to the extent practicable, an estimate of the types of resources from which such power should be acquired.”
- The Council’s recommendations as to the amounts of power and resource types take into account Bonneville’s statutory limits on how it offers and sells power and on using and acquiring resources to meet its obligations.

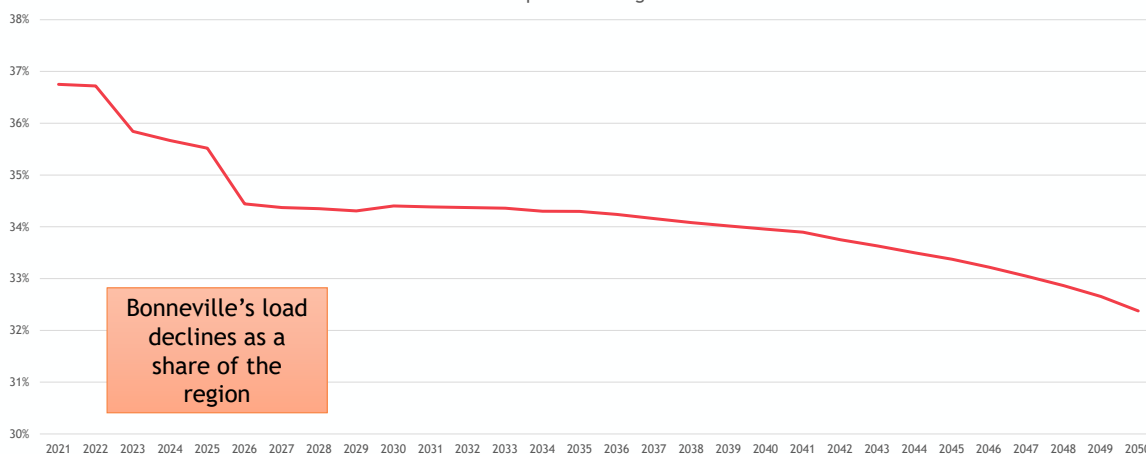


THE 2021
NORTHWEST
POWER PLAN

7

7

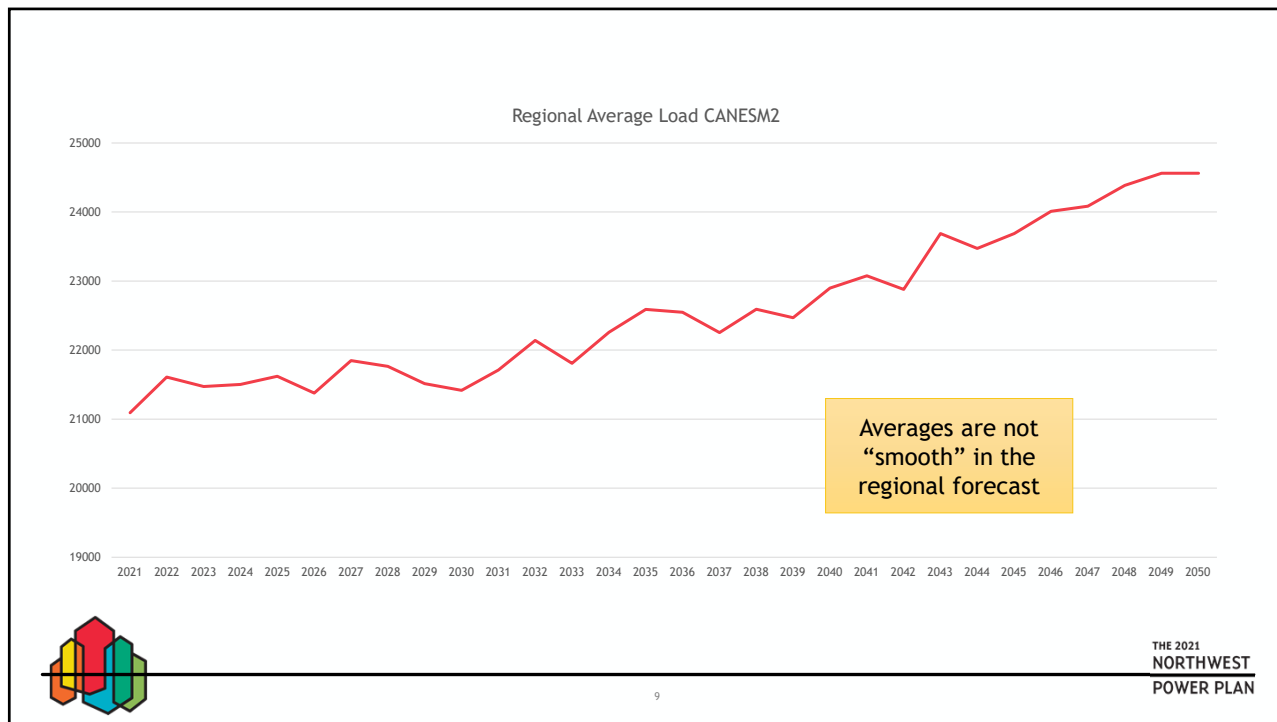
BPA as Proportion of Regional Load



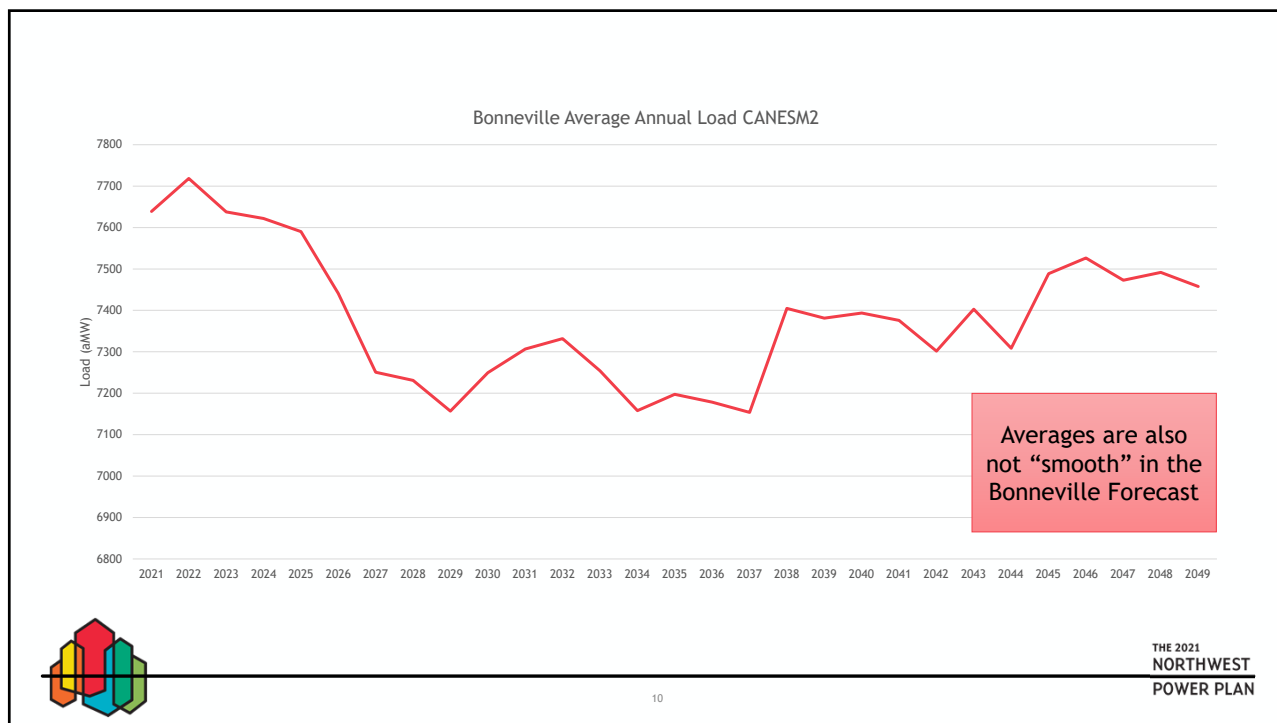
THE 2021
NORTHWEST
POWER PLAN

8

8



9



10

Downscaling the Regions Load to Bonneville

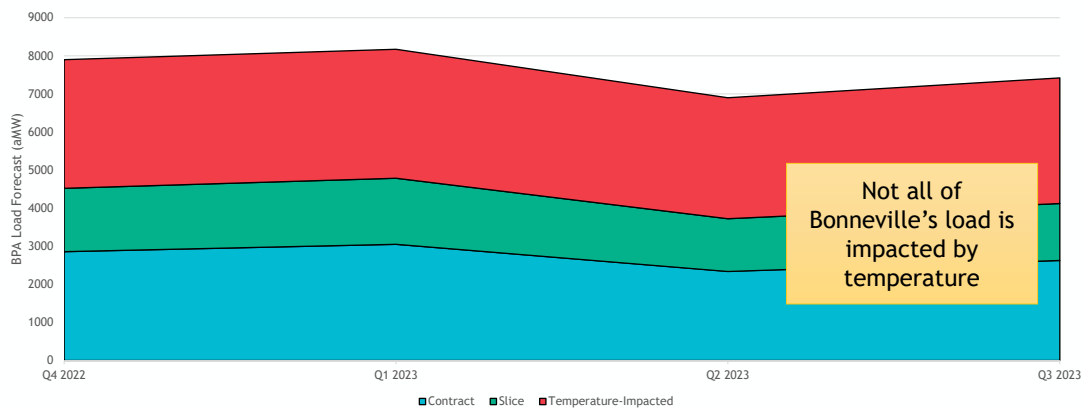
When discussing Bonneville rates there are always exceptions, but generally:

- A subset of Bonneville's customer utilities (generally load following customers) have temperature impacts on their load that translates through to the Bonneville load obligation
- Another portion of Bonneville's customers load served by Bonneville varies by the amount of generation being produced (generally slice & block customers)
- Bonneville has further contracts that do not increase or decrease with temperature or generation

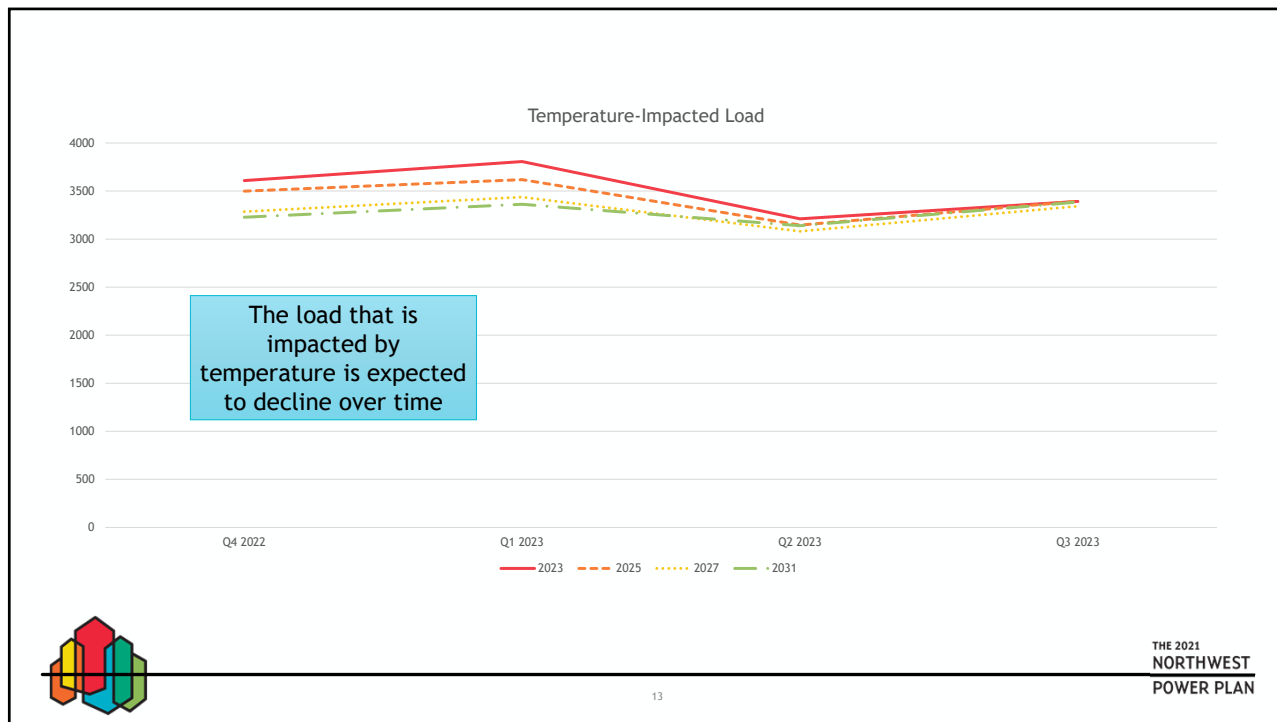


11

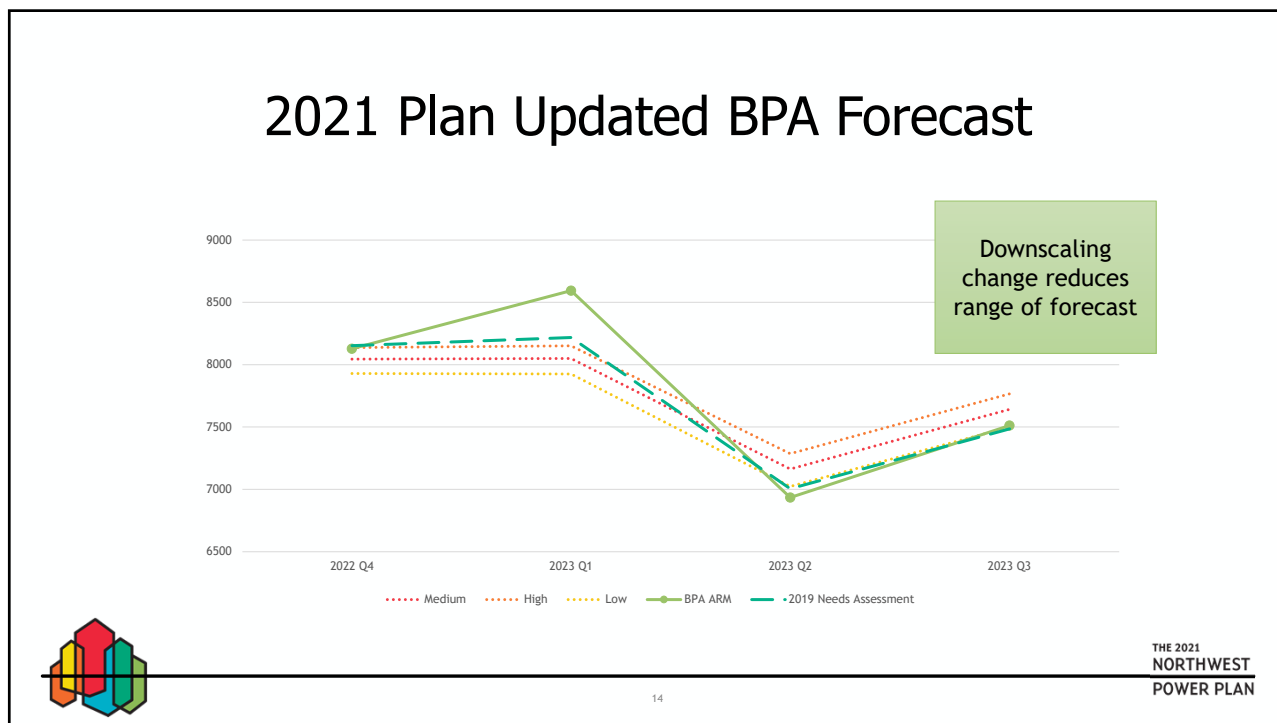
Components of Bonneville Adequacy Reserve Margin Load Calculation



12

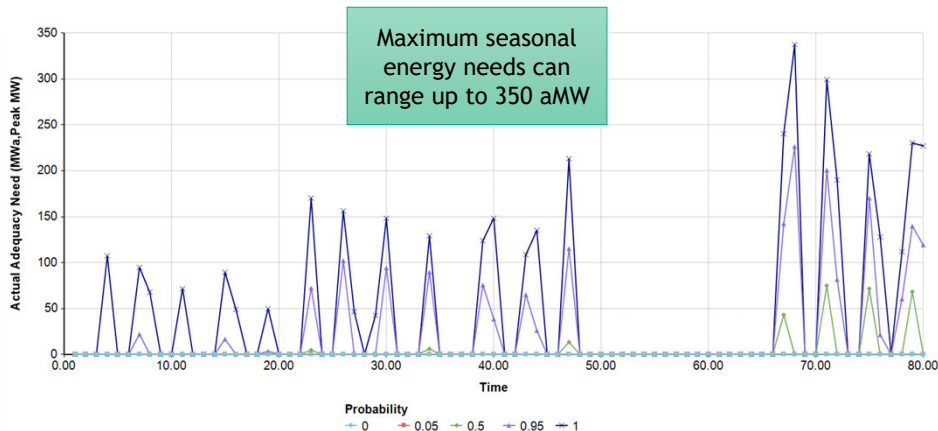


13



14

Energy Need with Updated Loads

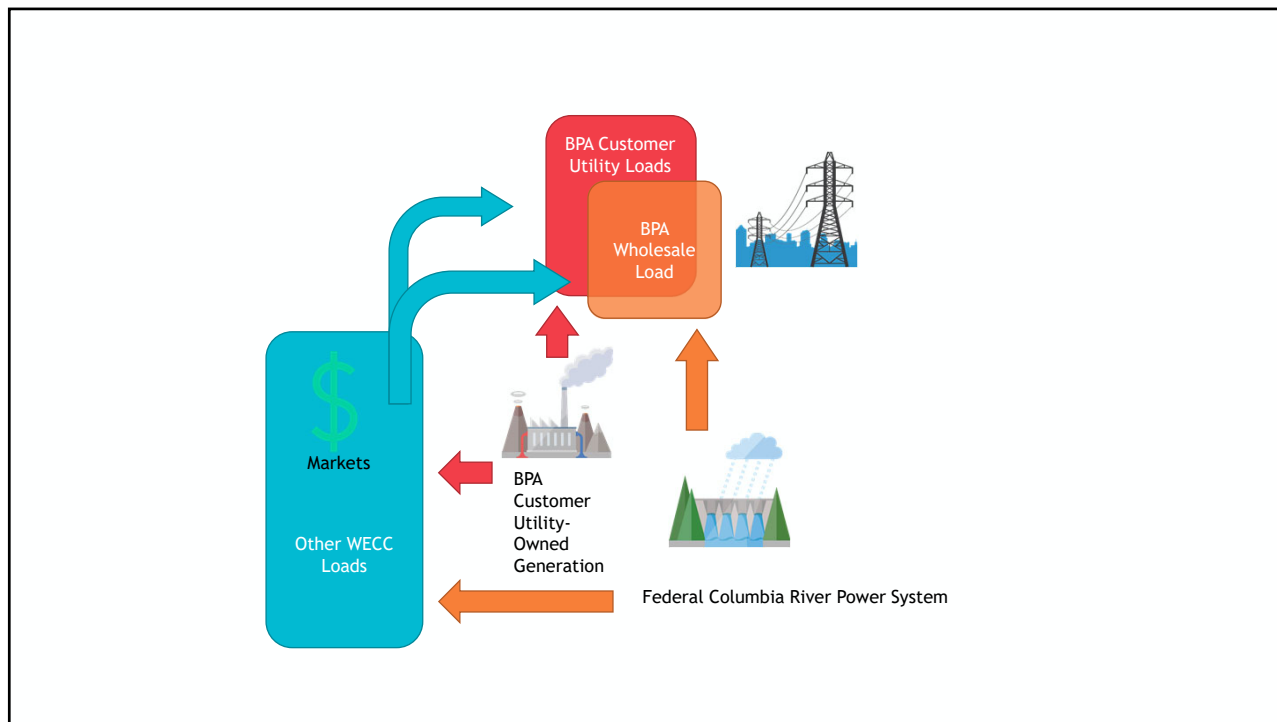


THE 2021
NORTHWEST
POWER PLAN

15

EE in the BPA Portfolio

16



17

Energy Efficiency

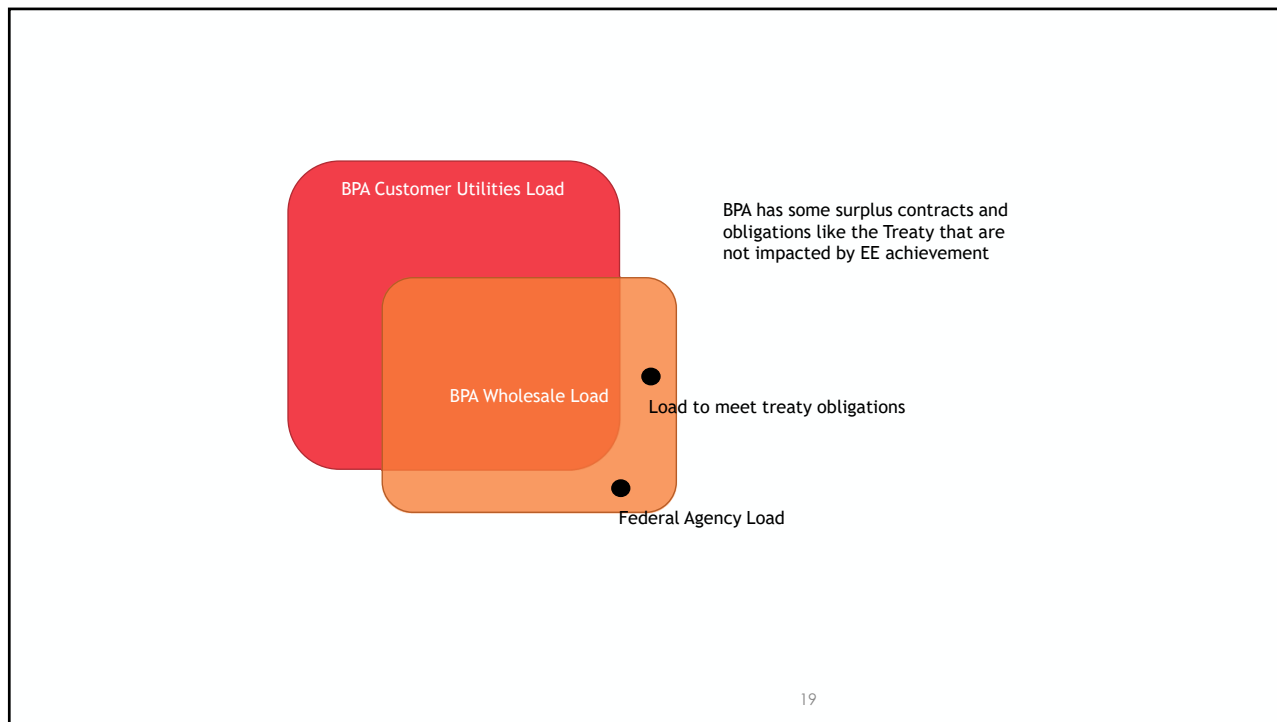
BPA Customer Utilities Load

The impact of EE on BPA wholesale load is based on the BPA customer utilities acquisition.

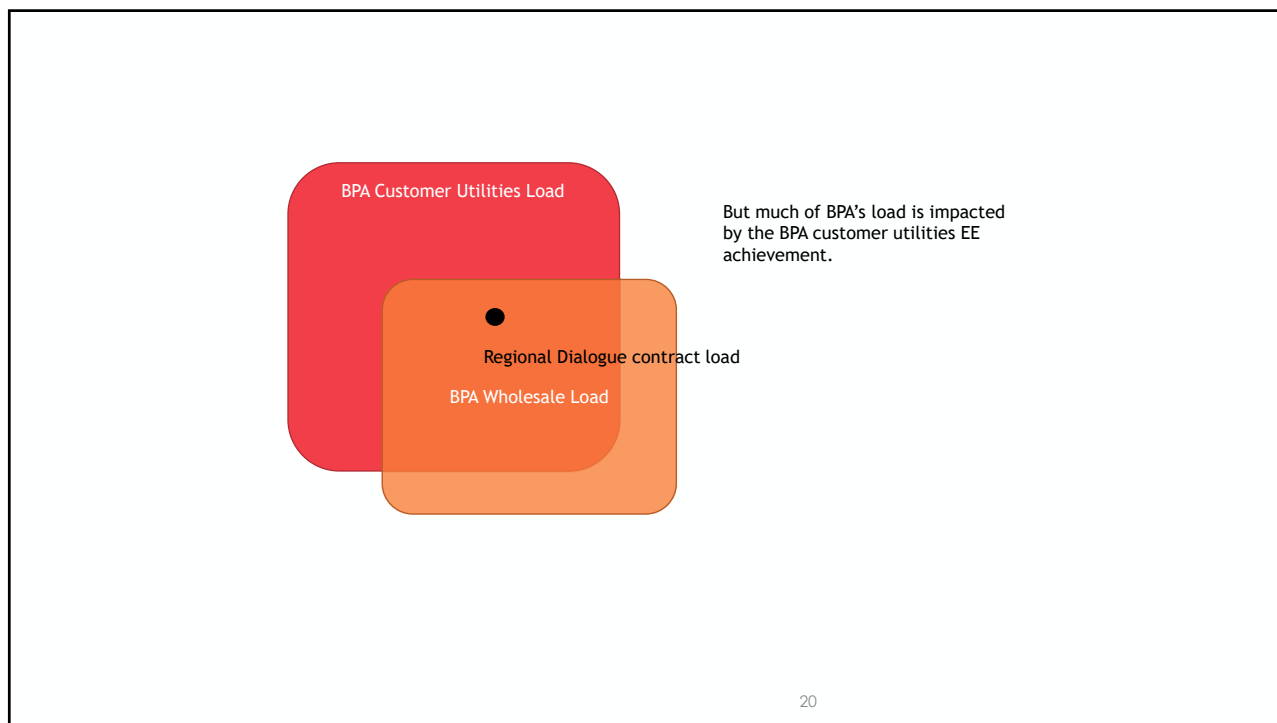
Our estimate of the potential EE that impacts the BPA wholesale load is based on all the load served by the BPA customer utilities.

18

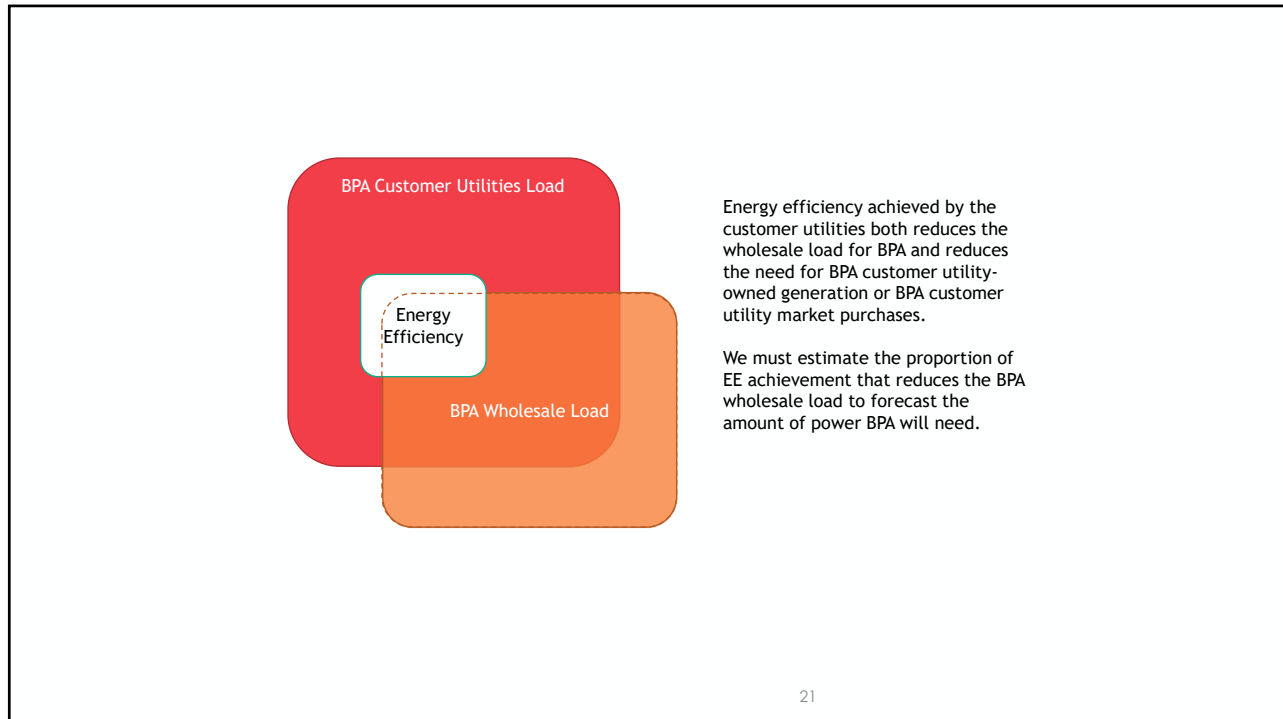
18



19



20



21

When EE is acquired by BPA...

It either...

- Reduces the load BPA is contractually obligated to serve through its Regional Dialogue contracts

Or...

- Reduces load BPA customer utilities serve through means other than taking contractual power from BPA



22

Estimated impact of EE on BPA's load obligation

Using the TRMbd Workbook with this adjustment we see EE changes the BPA obligation to serve load under the Regional Dialogue contracts anywhere from around 70% up to 92% based on how much EE acquired, on average EE changed the BPA obligation by **80.9%**.

I.e. for 10 aMW of EE purchased from the supply curves, we estimate BPA's load is reduced by 8.09 aMW.

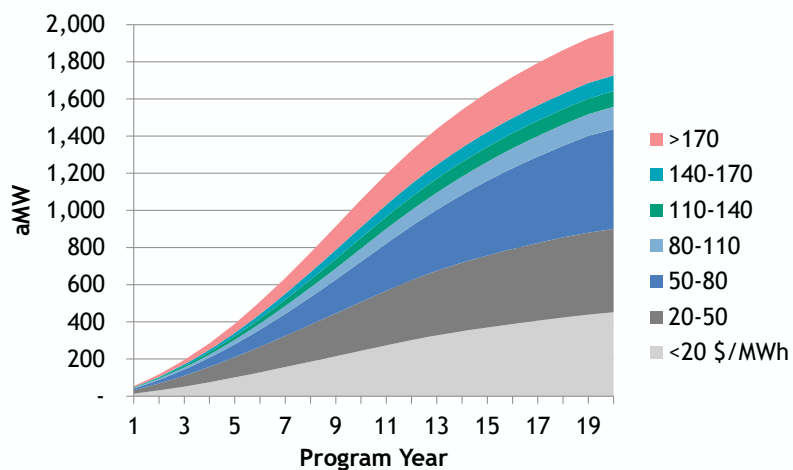


23

THE 2021
NORTHWEST
POWER PLAN

23

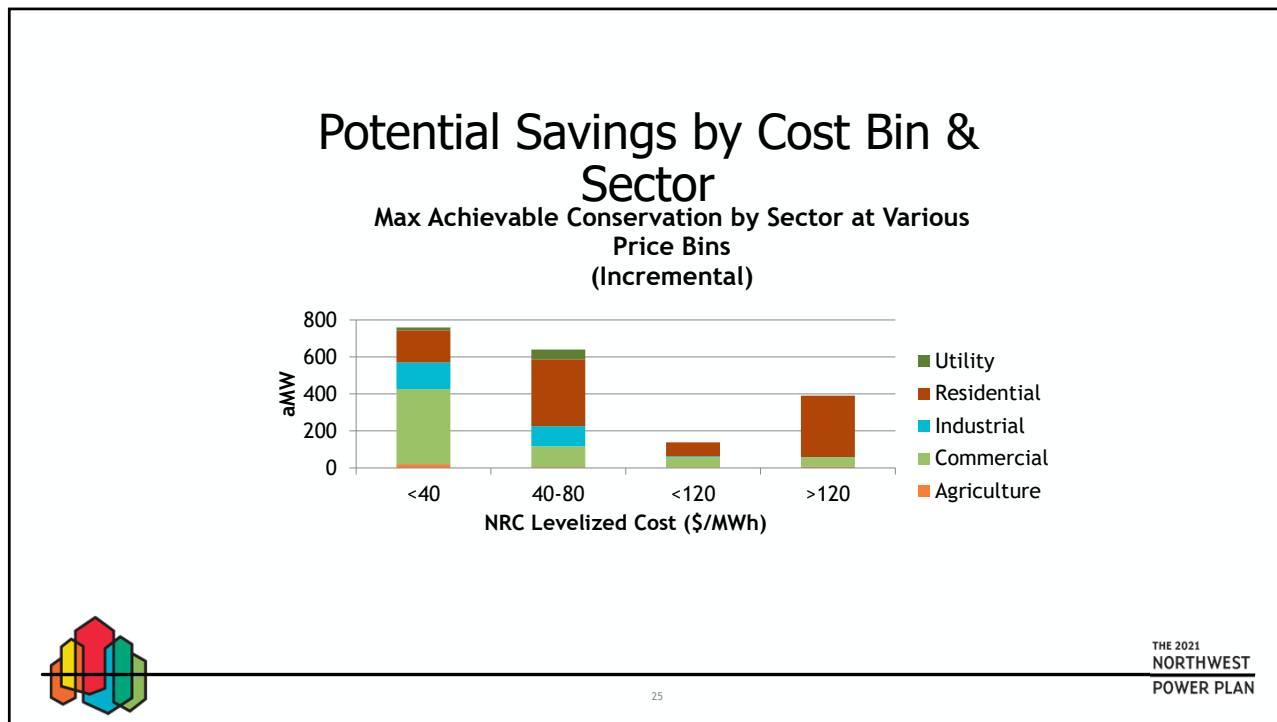
BPA Achievable Technical Potential by Levelized Cost Bin (2016\$/MWh) & Time



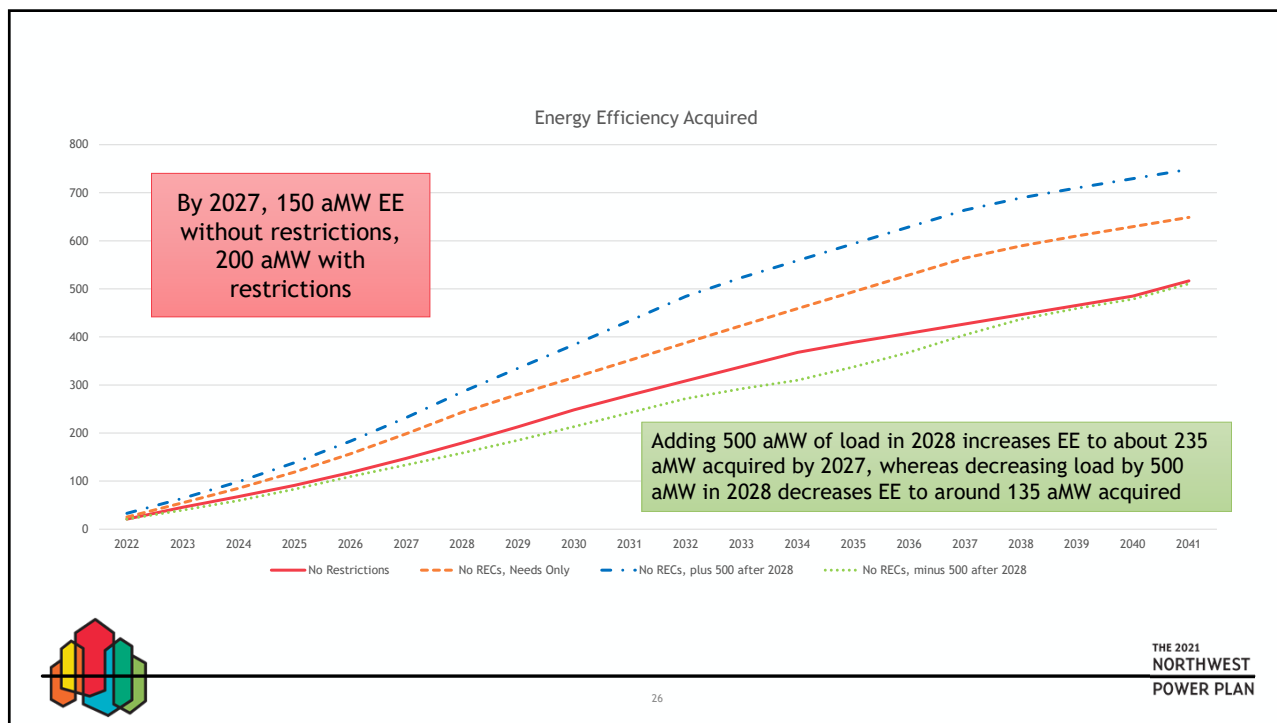
24

THE 2021
NORTHWEST
POWER PLAN

24



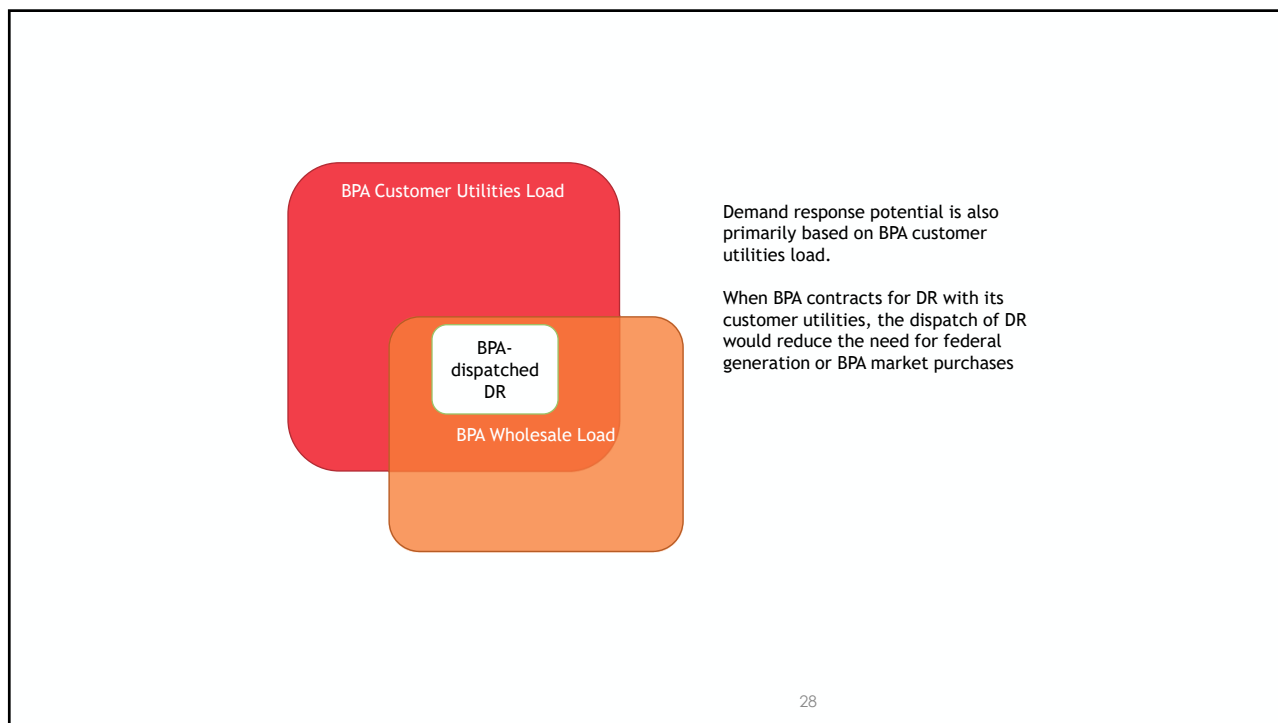
25



26

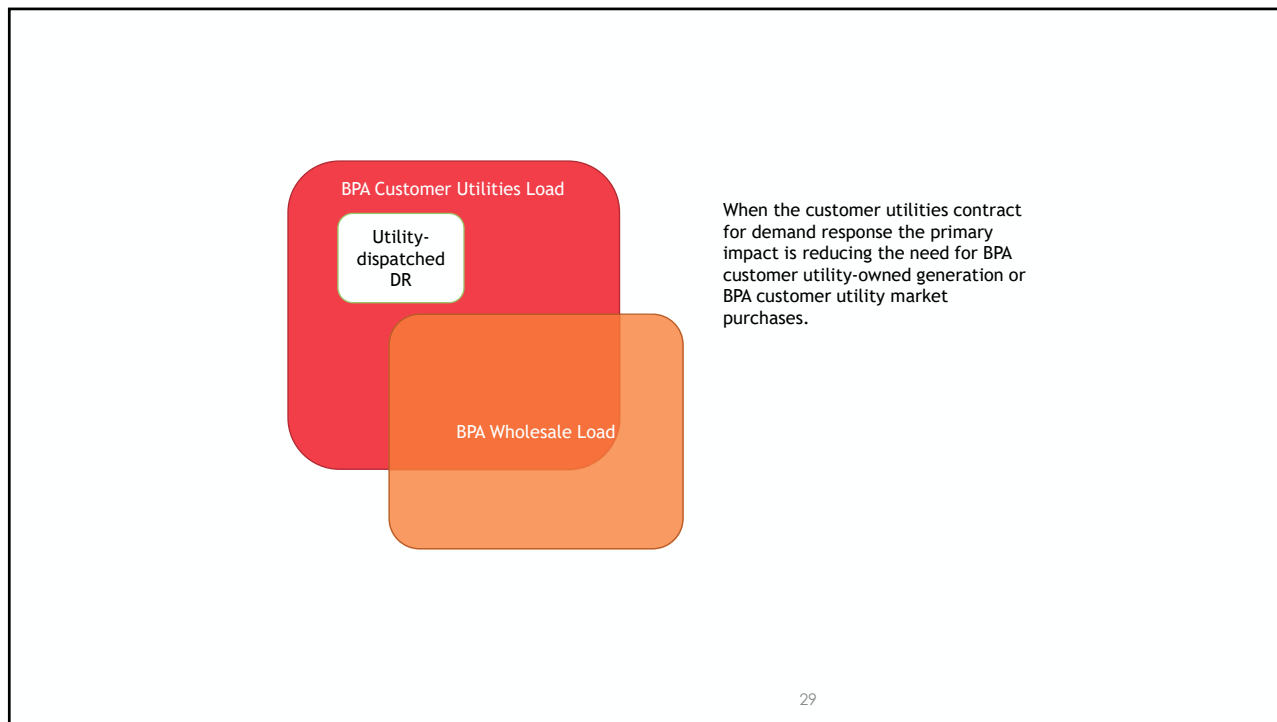


27

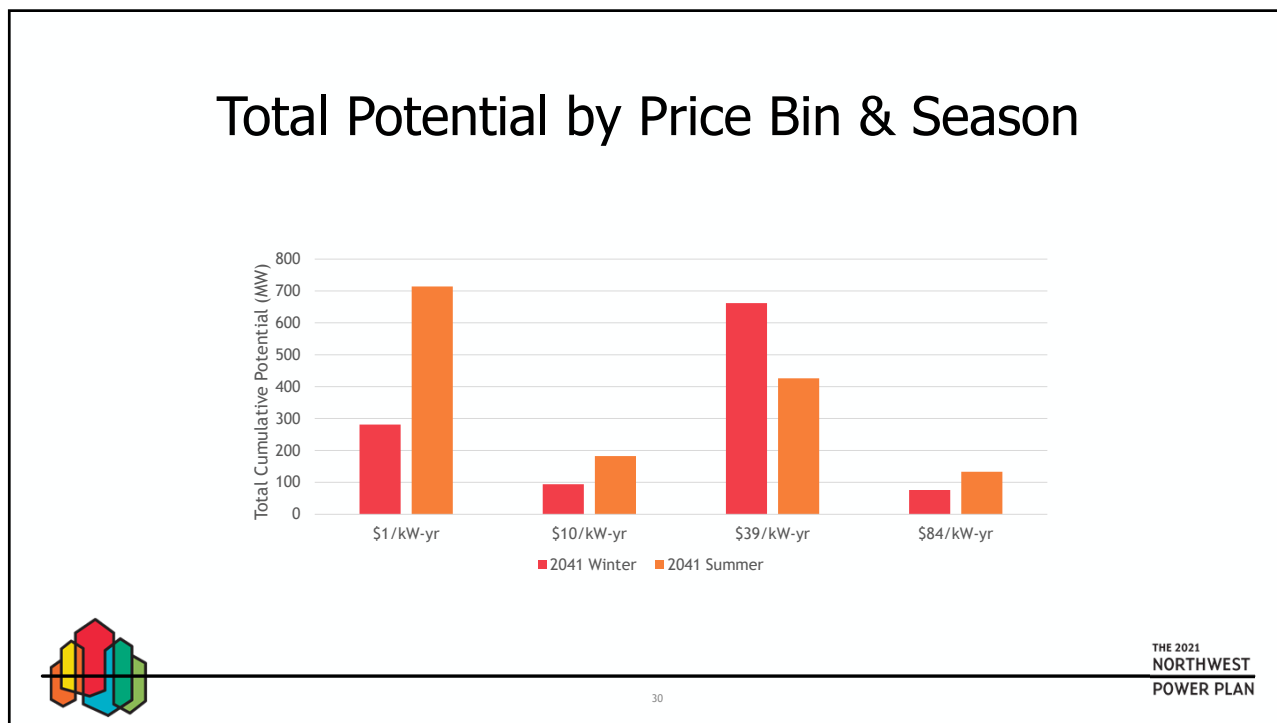


28

28



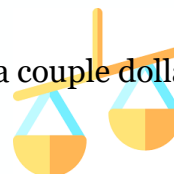
29



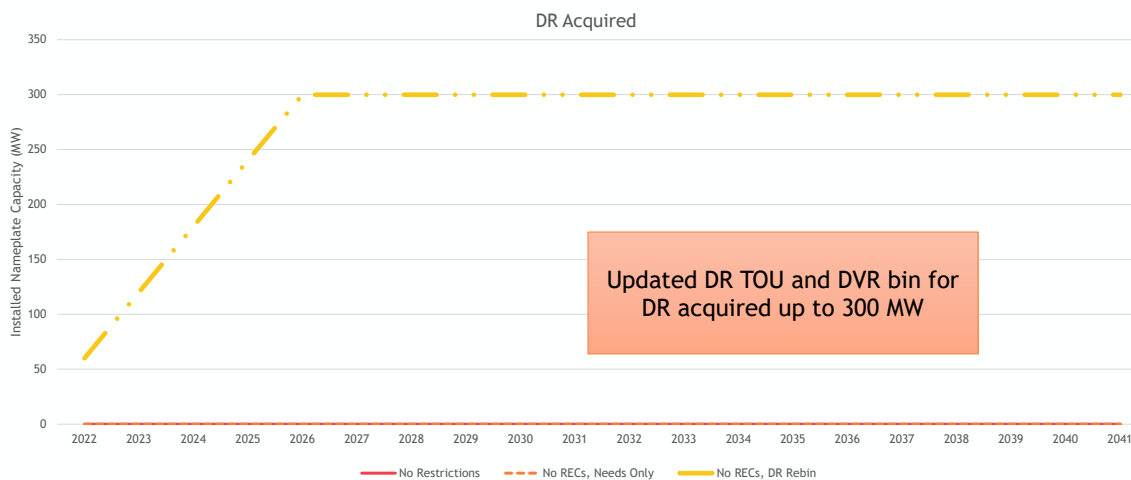
30

BPA Potential Compared to Region

- BPA DR Potential is ~40% of regional
 - BPA Residential is ~43% of region, due to higher electric shares for space and water heating
 - Relatively more potential in winter, due to more electric heating loads
- Levelized costs are comparable, within a couple dollars per kW-yr by bin



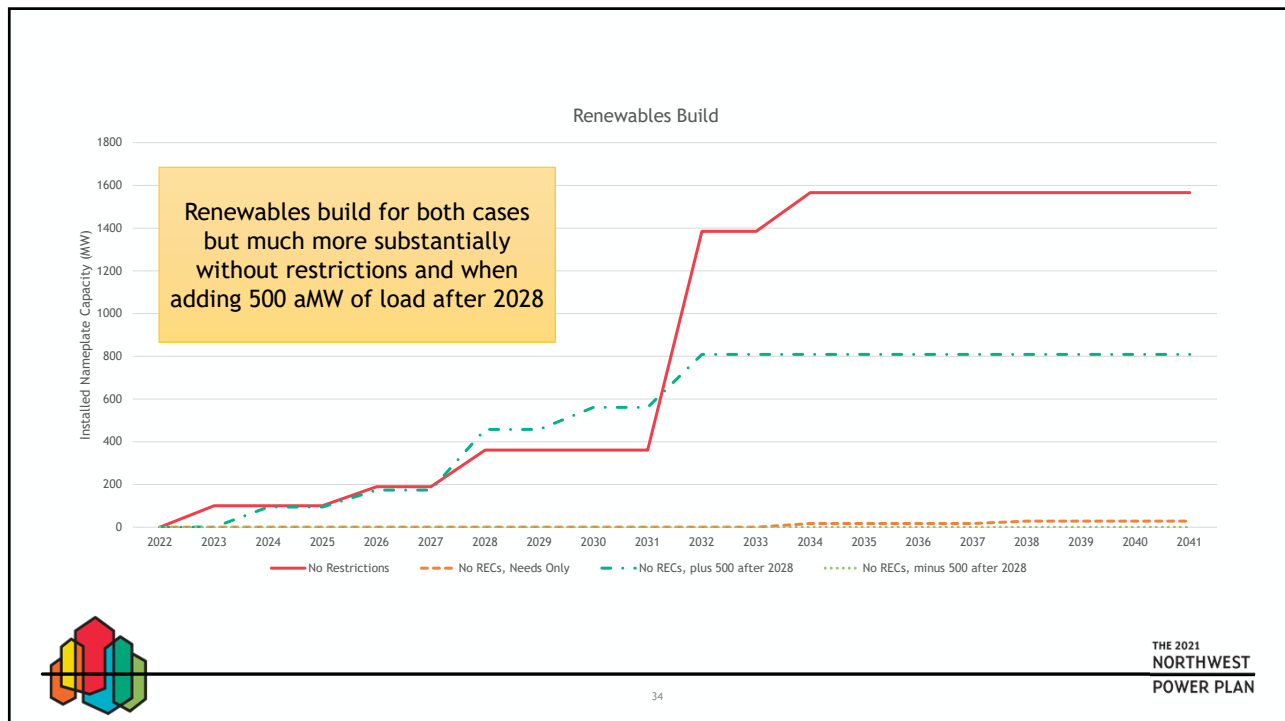
31



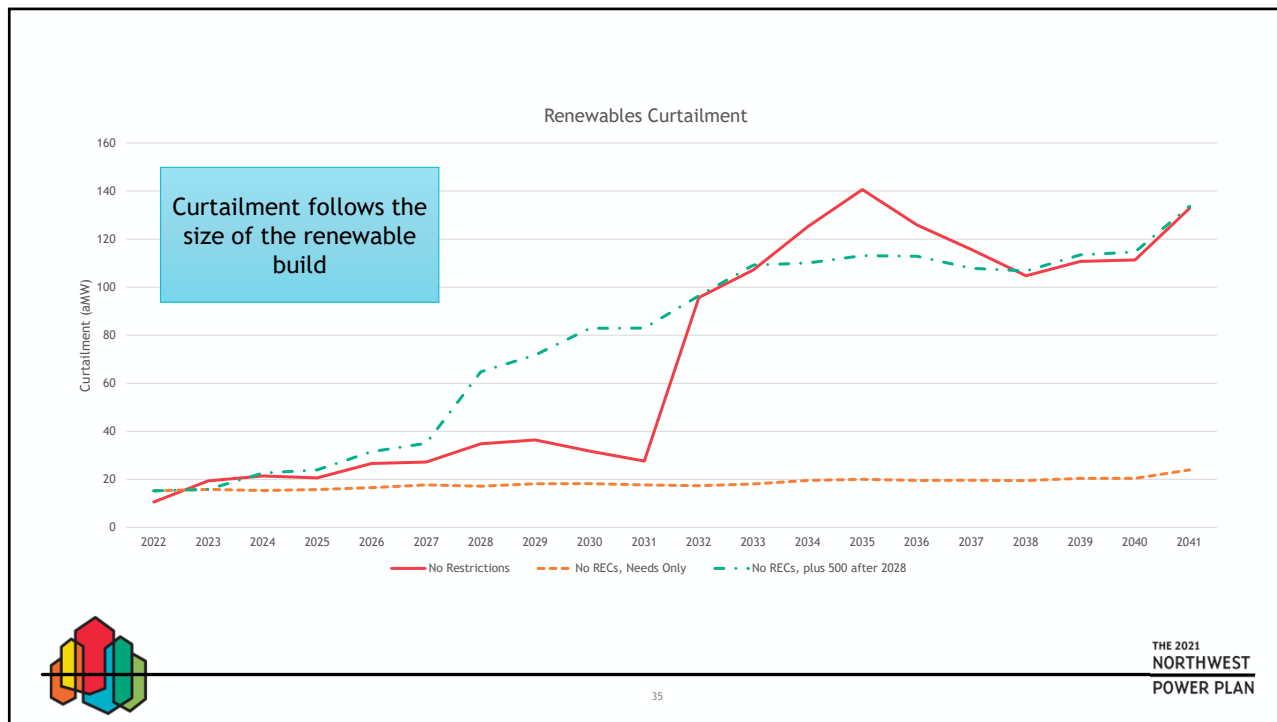
32



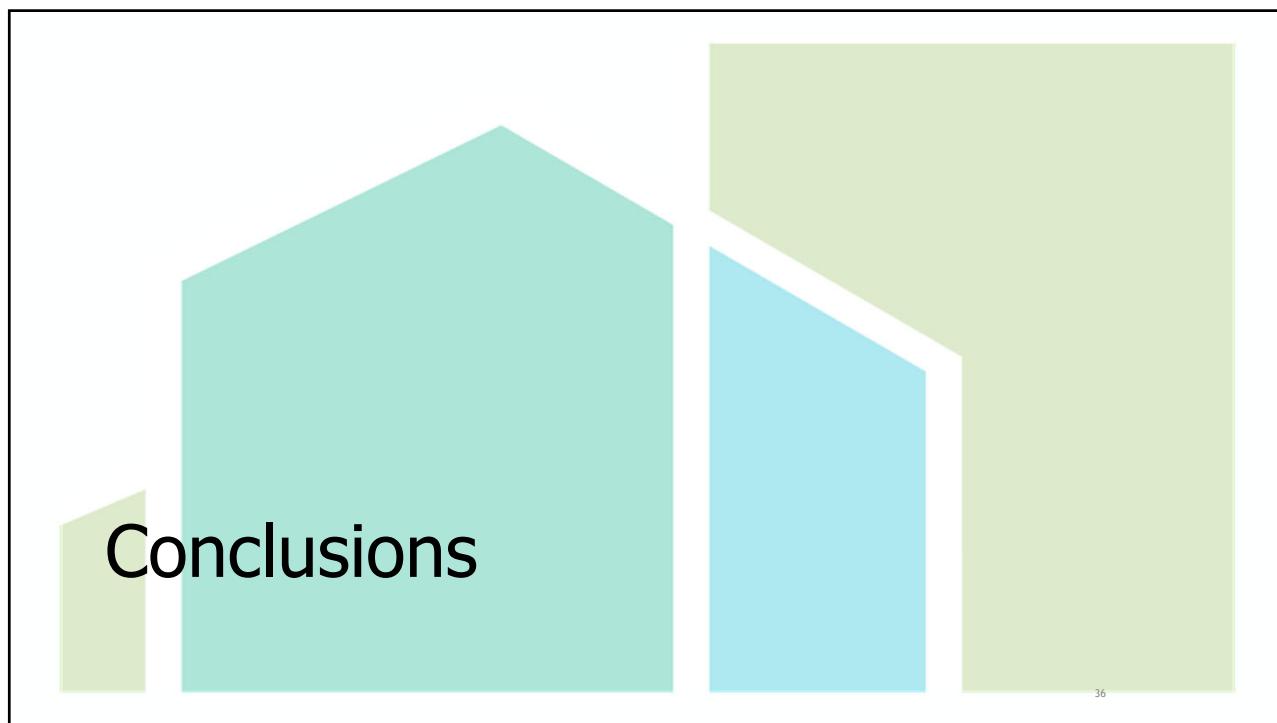
33



34



35



36

Challenges with Bonneville in RPM

- **Renewable builds likely overstated** - agent-based logic applied to an individual utility rather than the region overstates the forecast errors the “agent” would make and does not capture the partition
- **Load risk model doesn’t capture slice or subscription-like load dynamics** – fixed this load in the adequacy calculations but the cost impacts on the portfolio would be different with this logic implemented
- **Portfolio is more sensitive to REC forecast** – when RECs are included resource decisions change, the higher the REC price the more likely adding more renewables and less EE would reduce costs
- **No fidelity on hydro spill** – Bonneville adding renewables could impact hydro spill in ways that are not possible to capture in RPM
- **Assumes Bonneville’s contracts with customer utilities continue in a similar form**



37

THE 2021
NORTHWEST
POWER PLAN

37

Conclusions

- Bonneville has future needs which can be filled by EE, renewables, or some combination of the two
- Having all customer utility contracts end at the same date makes planning for resource acquisition and/or managing contract risk difficult
 - If obligation is added to the portfolio post-2028, adding resource before 2028 lowers portfolio cost
 - If obligation is removed post-2028, reducing resource acquisition before 2028 lowers portfolio cost
- Better fidelity on market interaction with Bonneville would likely reduce resource needs below what we see currently in the models and could change the value of renewable resources



38

THE 2021
NORTHWEST
POWER PLAN

38



39