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

January 7, 2020

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MEMORANDUM

TO: Power Committee

FROM: Ben Kujala

SUBJECT: Review of Plan Scenarios – Part 1

BACKGROUND:

Presenter: Ben Kujala

Summary: This review of the staff proposal on setting up the analyses for the plan scenarios is the first of two presentations.

The proposed scenarios were presented to the Power Committee in July (https://www.nwcouncil.org/sites/default/files/2019_0716_p1.pdf) and the Power Committee provided feedback on the scenario list in August.

This presentation details how staff proposes implementing these scenarios in the power plan analytical process.

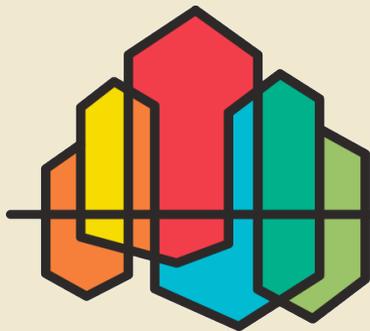
At this meeting the scenarios reviewed will be:

- Early retirement of coal generation
- Change reliance on extra-regional markets for resource adequacy
- Analyze the Bonneville Portfolio

Relevance: The scenarios and associated analyses help develop findings for drafting the plan.

Workplan: A.1.1 Develop and analyze scenarios for the Power Plan

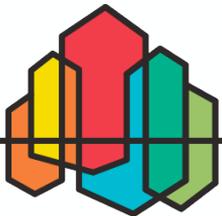
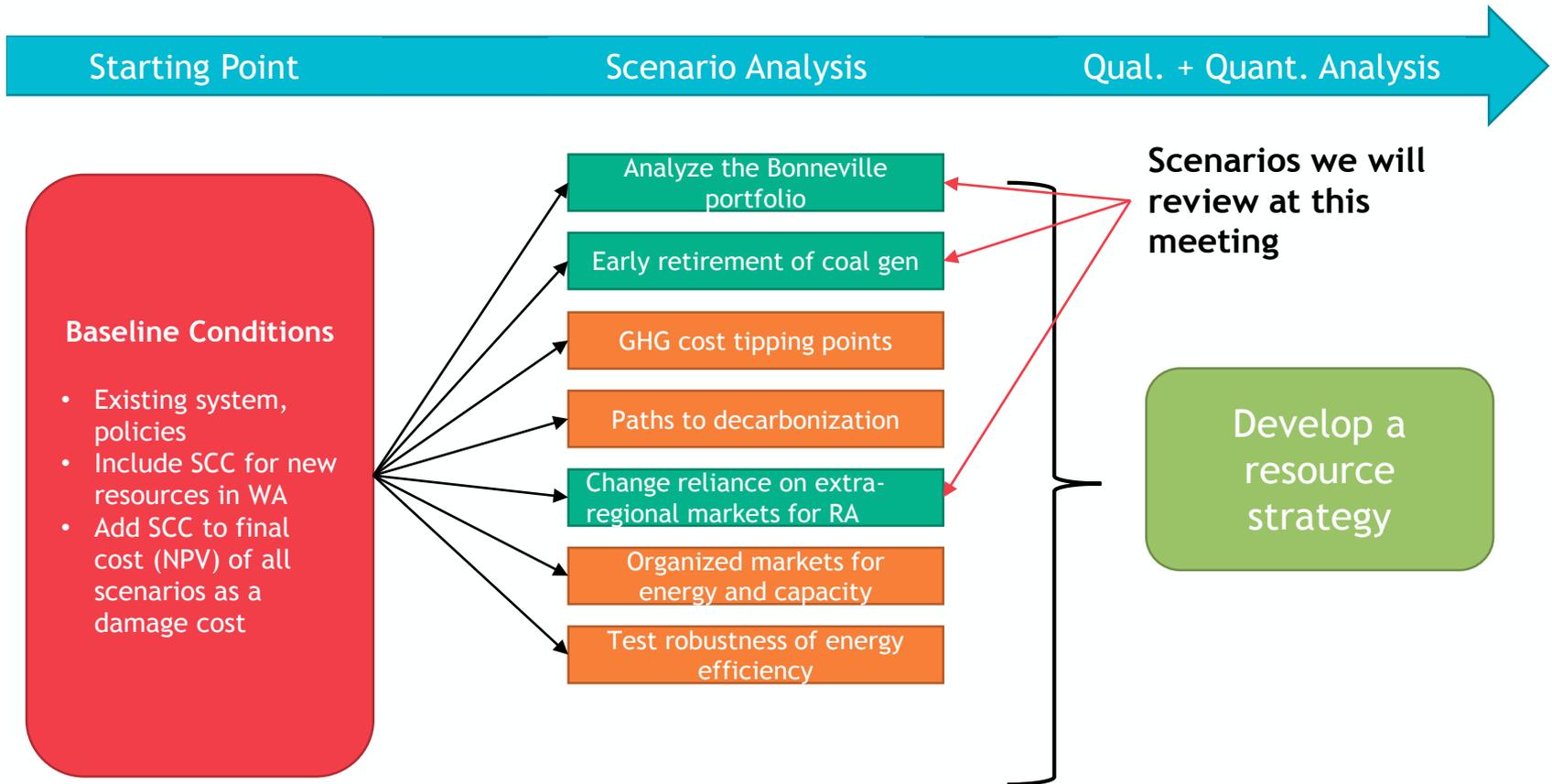
Review of Plan Scenarios - Part 1



THE 2021
NORTHWEST
POWER PLAN

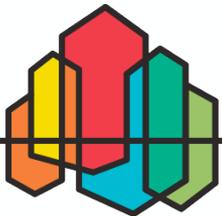
FOR A SECURE & AFFORDABLE
ENERGY FUTURE

Building the 2021 Power Plan

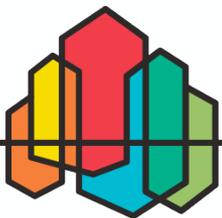
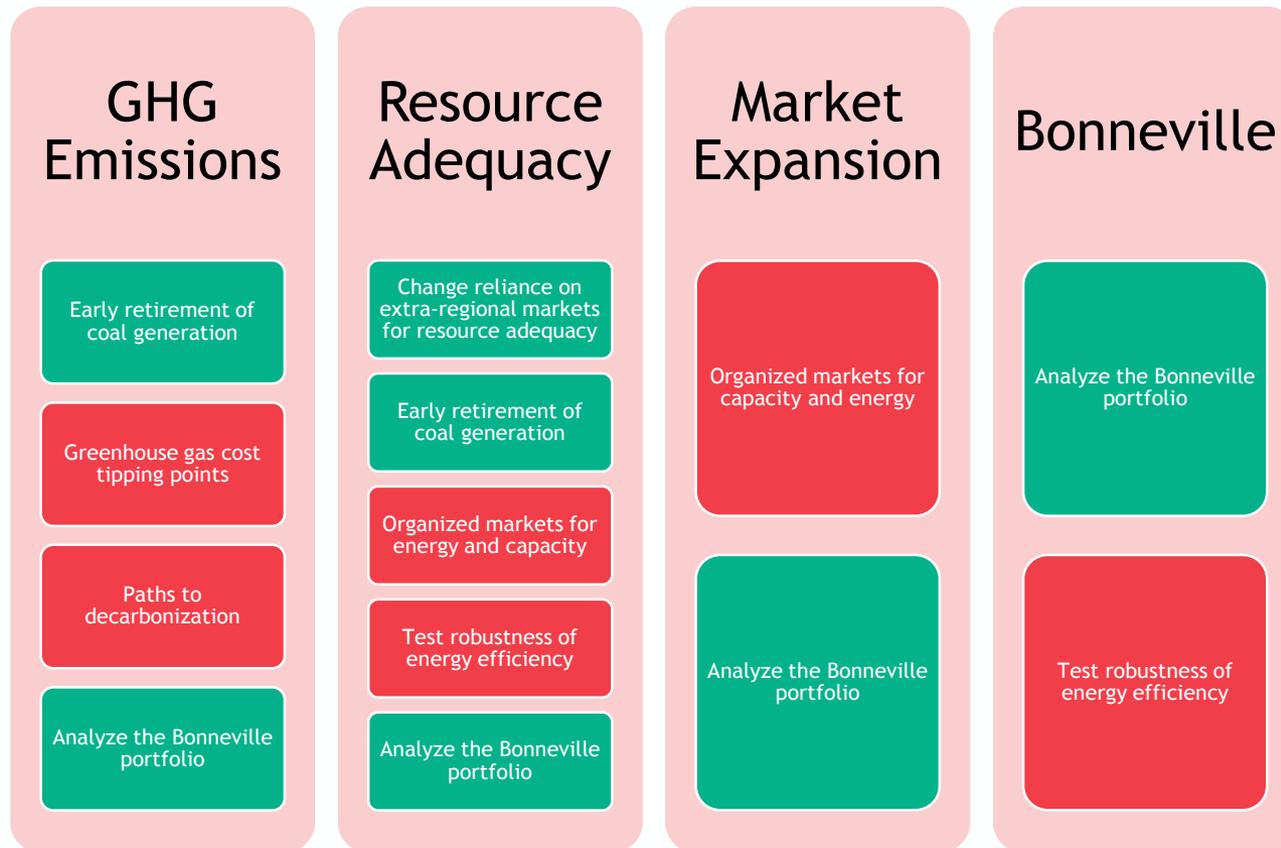


What are the high-level themes?

- GHG Emissions
- Resource Adequacy
- Market Expansion
- Recommendations to Bonneville

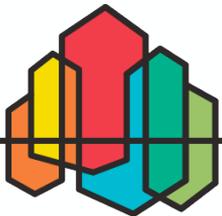
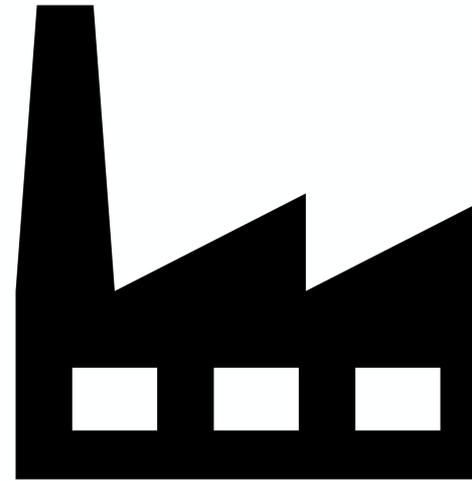


Primary connection to high-Level themes



Early Retirement of Coal Generation

- Examine implications of early retirement of all regional coal plants – and to some extent the rest of the West
- Study resulting greenhouse gas emissions and reliability
- Plan implications:
 - Basis for comparison of emission reductions for other scenarios
 - Informs the Resource Development Plan
 - Examine impacts on cost-effective methods for providing reserves

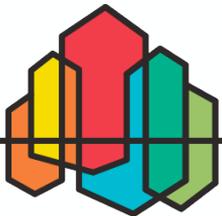


Proposed In-Scope

Coal Plant Unit	Announced/Existing Retirement Date (EOY)	Baseline Conditions*	Scenario: Early Retirement (EOY)
Colstrip Unit 1	2019	Retired	Retired
Colstrip Unit 2	2019	Retired	Retired
Boardman	2020	Retired	Retired
Centralia 1	2020	Retired	Retired
North Valmy 1	2021	2021	2021
Centralia 2	2025	2025	2025
North Valmy 2	2025	2025	2025
Jim Bridger 1	2023	2023	2022
Jim Bridger 2	2028**	2028	2026
Colstrip 3	2027**	2037	2025
Colstrip 4	2027**	2037	2025 (WA Legislation)
Jim Bridger 3	--	2037**	2026
Jim Bridger 4	--	2037**	2026

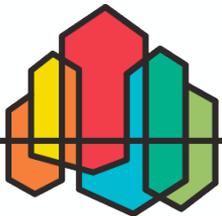
* Baseline conditions – announced retirement date or expected end-of-useful life estimate

** PAC and IPC still working out details of the accelerated retirement of Bridger 2, dates could be considered tentative. PAC announced in its 2019 IRP preferred portfolio that the most cost-effective strategy for PAC would be to end its involvement in Colstrip 3 and 4 in 2027. PAC is only 10% owner in these units so clearly this is not a formal retirement announcement, rather an indication of current analyses and discussions between owners to come. Jim Bridger 3 and 4 are currently assumed to operate until the end of their useful life, indicated as 2037 in the PAC 2019 IRP.



Proposed Out-of-Scope

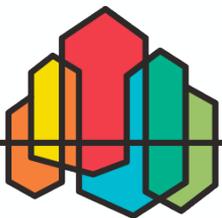
- Changes in the wholesale price of coal
- Changes in the wholesale and retail price of natural gas
- Transient Stability



Change Reliance on Extra-Regional Markets for Resource Adequacy



- Test relying on availability of resources outside our region when the region has an adequacy need
- Examine the ability to deliver the power to the region
- Informs conversations regarding:
 - The Council's resource adequacy standard
 - Those considering differing market depths
 - Efforts to pool resource adequacy
 - Forecast of regional reserve and reliability requirements
 - Resource development plan



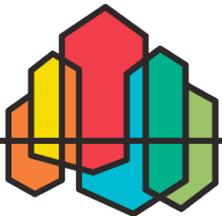
Proposed In-Scope

- Change Adequacy Reserve Margin / Planning Reserve Margin for the region
- Examine if incremental market reliance impacts Associated System Capacity Contribution of new resources
- *Potentially* examine impacts of wind and solar generation external to the region on available power for meeting regional peak load and the interaction of new and existing resources in the region with these external market dynamics
- Examine transmission limitations and outage likelihoods



Proposed Out-of-Scope

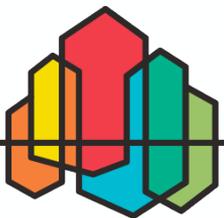
- Change in average avoided emissions rate from the market
- Change in the external electricity price forecast
- Change in the fuel price forecast



Analyze the Bonneville Portfolio

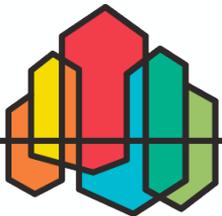


- Portfolio Analysis:
 - What is the Bonneville Portfolio?
 - Why should the Council analyze it?
 - What is the impact of the 2028 end of the regional dialogue contracts?



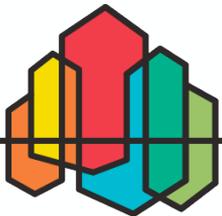
What Resources are Required to Meet the Administrator's Obligation?

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.”



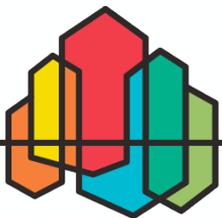
Limitations of Portfolio Analysis

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.



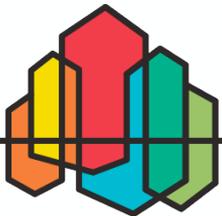
Coordination with Bonneville

- 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



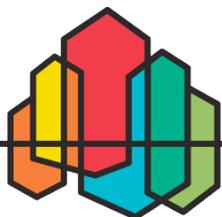
Proposed In-Scope

- Bonneville load based on expected obligation
 - Hourly forecast prior to 2028
 - Hourly forecast post-2028 including:
 - Higher obligation (e.g. all current customers plus 15 to 20%-ish)
 - Medium or persistent obligation
 - Lower obligation (e.g. reduce subscription by 35%-ish)
 - Proportional assumptions or parameters to represent above high watermark obligations and the expected weekly/daily/hourly shape (flat or otherwise) of that obligation
 - Bonneville commercial contracts from 1+ to 20 years out - e.g. locked in power purchases whether tied to a resource or just a contract for delivery of unspecified power
 - Includes Bonneville's share of Canadian Entitlement



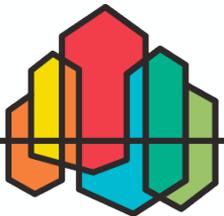
Proposed In-Scope

- Bonneville Load to Market Price Correlation - Intra-quarterly correlations used in RPM - e.g. should the hours where Bonneville's load is high be the same hours with high Mid-C prices?
- Bonneville market reliance limits - what is the amount of market power that is available to BPA to meet seasonal energy and capacity needs?
 - Should be consistent with post-2028 obligation levels



Proposed In-Scope

- Bonneville's transmission to market - beyond adequacy what is the maximum transmission that should be used for marketing opportunities when both purchasing and selling power?
- Bonneville-specific existing resource parameters – aggregate for RPM
 - Hydro – federal not regional
 - Columbia Generating Station
 - Wind PPAs
 - Anticipated Hydro Upgrades
 - Other?
- State RPS / clean policy parameters - should Bonneville acquire resources to facilitate customer utility compliance with state policies?



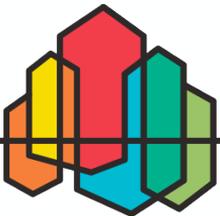
Proposed In-Scope

- Bonneville-specific market greenhouse gas emissions rate
- Bonneville-specific generating resource potential and cost (with BPA-specific debt assumptions)
- Bonneville EE Supply Curves
- Bonneville DR Supply Curves - assuming Bonneville can arrange a contract for any DR potential in a customer utility that would be dispatched for Bonneville needs



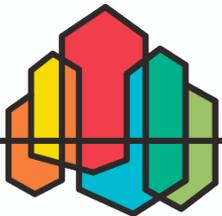
Proposed In-Scope

- Bonneville ASCC assumptions – *potentially* using federal GENESYS
- Existing System Revenue Requirement - what is the current Bonneville portfolio revenue requirement?
- Debt Balance and Payments
 - What is the current debt and forecast payments?
 - How would new acquisitions be financed and what would be the impact to Bonneville debt?



Proposed Out-of-Scope

- Change in third-party integration services (VERBS)
- Different Mid-C Market Price based on Bonneville specific trading dynamics
- Bonneville specific Energy 2020 run



A photograph of a mountainous landscape shrouded in thick white mist. In the foreground, a concrete railing is visible on the left. Below the mist, a dark lake is nestled in a valley. The mountains in the background are partially obscured by the fog, with some peaks showing patches of green and brown vegetation. The overall atmosphere is serene and somewhat mysterious.

Questions?