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December 8, 2020

MEMORANDUM

TO: Power Committee

FROM: John Ollis, Manager of Planning and Analysis

SUBJECT: Adequacy Results from Redeveloped GENESYS

BACKGROUND:

Presenter: John Ollis

Summary: To ensure that the resource strategy in the 2021 power plan will lead to an adequate supply, the Council's adequacy standard is incorporated directly into the Regional Portfolio Model via the Adequacy Reserve Margin (ARM). The ARM represents the amount of surplus generation above the expected load to cover unknown future conditions, such as extreme temperature events, low river runoff conditions, poor wind and solar generation and generating resource breakdowns. The Associated System Capacity Contribution (ASCC) is the amount of reliable capacity that an added resource contributes toward meeting the ARM requirement. At the August power committee meeting, the Council saw a description of the ARM calculations using the classic GENESYS software. This presentation will focus on the draft adequacy reserve margin results from the redeveloped GENESYS, and the draft ASCC results from the redeveloped GENESYS will be presented at a future meeting.

Relevance: Through its power plan, the Council is mandated to ensure an adequate, efficient, economic and reliable power supply. Toward that end, the Council adopted a regional adequacy standard in 2011. By using the ARM and Associate System Capacity Contribution (ASCC) metrics in its

planning models, the Council ensures that future resource acquisitions will not lead to costly overbuilt systems or to inadequate underbuilt systems.

Workplan: A.6.4. Finalize models for use in the plan after testing
A.6.5. Model based analysis

Background: The Adequacy Reserve Margin is the amount of surplus generating capability above the expected load required to maintain an adequate power supply. The ARM thresholds are derived from resource and load data taken from a stochastic GENESYS study that produces a precisely adequate system (i.e. exactly meets the 5% LOLP target). The theory is that acquiring sufficient new resource capability to meet the ARM thresholds will result in a supply that, when analyzed stochastically, will yield a 5% LOLP.

The Associated System Capacity Contribution is a measure of how much reliable capacity a resource provides when added to a power supply. It indicates how much new load can be served by adding this resource, without affecting adequacy. A resource's ASCC is assessed by analyzing how much a potential peak-hour shortfall is reduced by adding an incremental amount of new resource. However, because of the dynamic interaction among all resources in a power supply, the ASCC for a specific resource can change as the resource mix changes. To accommodate for this dynamic interaction, aggregate ASCC values are assessed for many different combinations of new resources and are stored in an ASCC array (or table). When resources are needed to meet the ARM threshold, the composite ASCC value for the entire package of new resources can be interpolated from the ASCC array.

More Info: This presentation slides are pending the results of ongoing studies and recommendations from the December 9th, 2020 System Analysis Advisory Committee meeting.

[August Power Committee Discussion of Adequacy Reserve Margin](#)

Adequacy Update

Power Committee

December 15, 2020

John Ollis



**THE 2021
NORTHWEST
POWER PLAN**

FOR A SECURE & AFFORDABLE
ENERGY FUTURE

Adequacy Reserve Margin Update

For the Needs Assessment for the plan:

- Inside the region: No additional resources, coal retirements as currently announced.
 - Jim Bridger 1 out after 2023
 - Centralia 2 and North Valmy 2 out after 2025
 - Jim Bridger 2 out after 2028
- Outside the region: The long term AURORA buildout
 - Represented as extra-regional load forecasts as in AURORA and market supply price bins reflecting retirements and additions per the AURORA forecast
- Transmission limitations: Similar to AURORA



Adequacy Results: No Market Reliance Assumptions

Per a simple deficit analysis

- 2023 LOLP: Under 1%
- 2027 LOLP: Under 1%
- 2031 LOLP: Under 1%



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- This would imply the Adequacy Reserve Margin is 0% in every quarter for 2023, 2027, 2031 energy and capacity.



Observations

- Two factors lead to the lower LOLP in classic GENESYS runs.

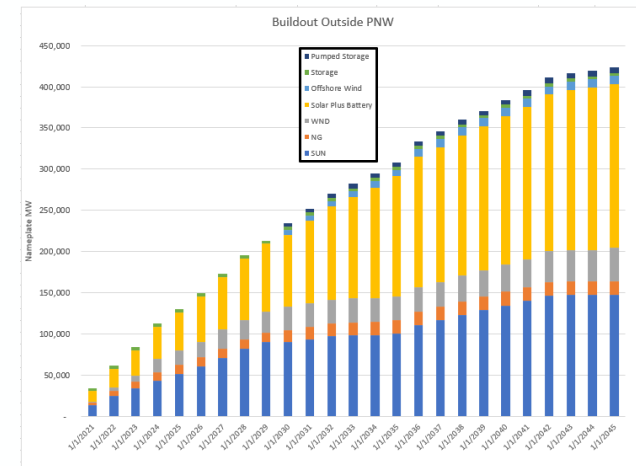
- Large external market buildout leading to massive imports, especially midday.**

The following is the new build in the WECC on a nameplate basis.

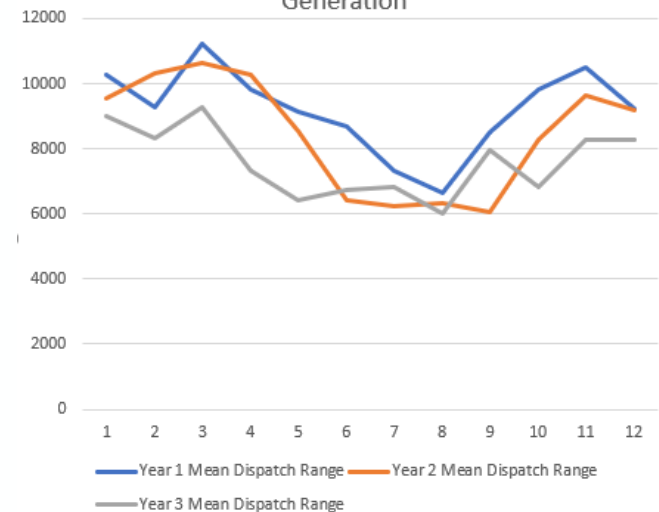
- 83 GW by 2023
- 149 GW by 2026
- 252 GW by 2031

- Expected northwest system intra-day flexibility varies from 6,000 to 12,000 MW depending on hydro conditions.**

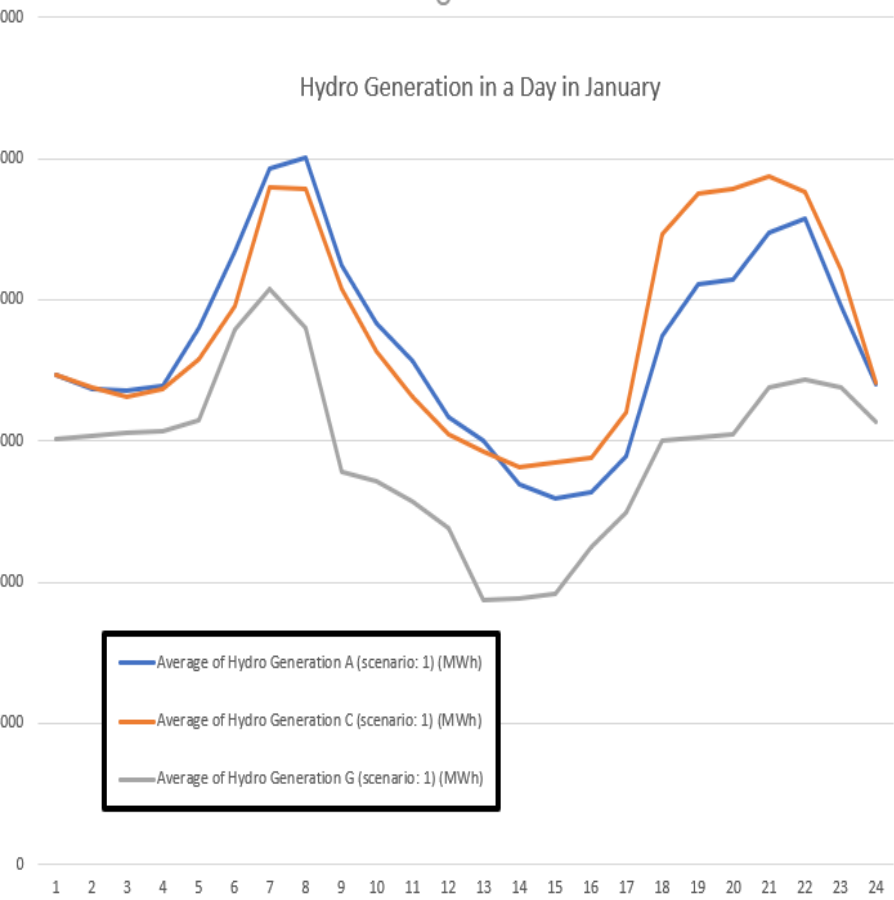
- Hydro
- Thermal



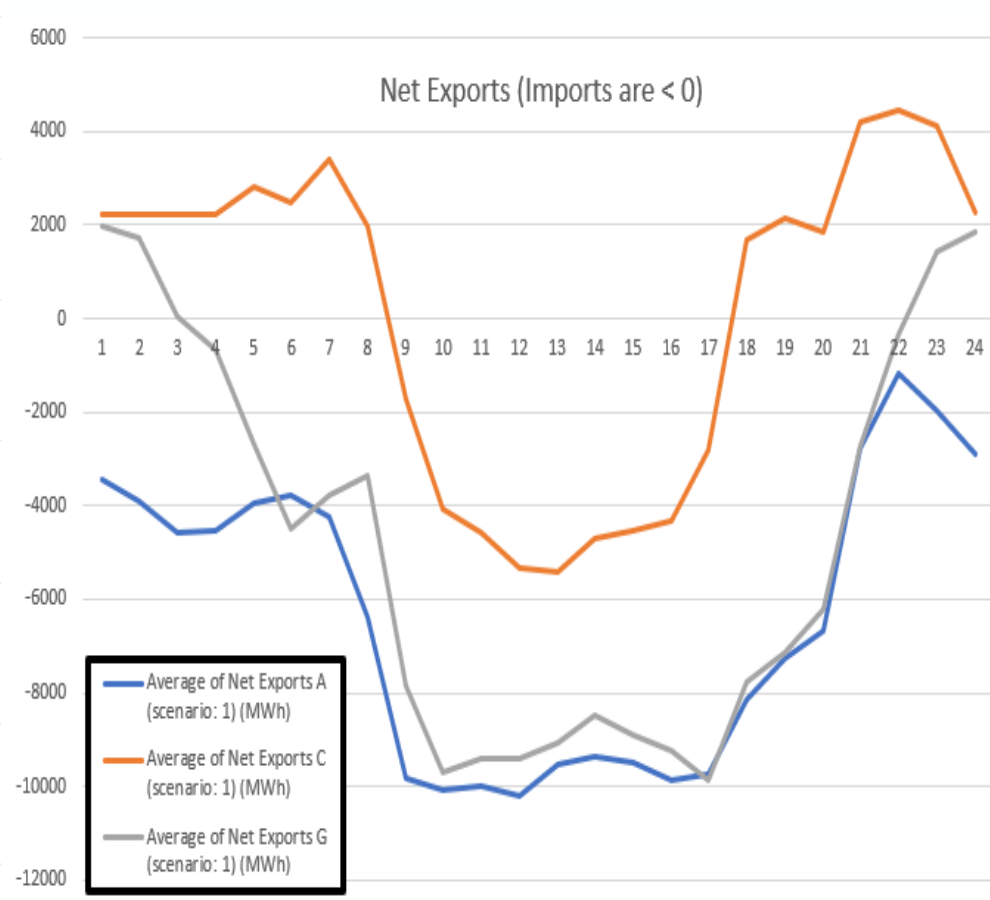
Intradaily Flexibility of NW Hydro and Thermal Generation



Hydro Generation in a Day in January



Net Exports (Imports are < 0)



- The hydro system seems to have enough flexibility to absorb these imports mid-day.
- **From an adequacy perspective does the region want to rely on that many imports?**



Market Reliance in Baseline

- Understanding there are questions about market reliance, staff recommends the following next step.
 - Continue discussions with the RAAC/SAAC to confirm the committees preferences for structuring market reliance assumptions in the Baseline Scenario as follows:

1. A similar market reliance limit strategy as used in the classic GENESYS on regional imports

OR

2. A market fundamentals approach that limits market supply for adequacy purposes (low hydro in CA, gas freeze off Desert SW, early gas retirement in CA, assume less aggressive external buildout)

- Use email correspondence and meetings to get consensus by January to lock down baseline assumptions.



A scenic landscape photograph of a mountain range with a lake, partially obscured by white geometric shapes. The mountains are rugged and covered in green vegetation, with a large body of water in the foreground. The sky is overcast and hazy. The image is framed by several white, angular, geometric shapes that create a modern, architectural feel.

Questions

John Ollis

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