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May 5, 2020

MEMORANDUM

TO: Council Members

FROM: John Ollis, Manager of Planning and Analysis

SUBJECT: Update on Redeveloped GENESYS

BACKGROUND:

Presenter: John Ollis

Summary: Since the 7th Power Plan, the capabilities of GENESYS, the Council's adequacy assessment and hydro operations model have been enhanced to better prepare it to provide analytics for the 2021 Power Plan. Staff will summarize some of the functionality of the enhanced model, illustrate some of its new capabilities, update the committee on the state of the stakeholder process and feedback about the redeveloped model.

Relevance: In development of the 2021 Power Plan, Council staff will use the redeveloped GENESYS model as an analytical tool for understanding the impacts of changes in the hydroelectric system's operation on the regional power system and to assess resource adequacy.

The Council contracted with PSR to redevelop the GENESYS model in order to bring the software code up to current standards and to implement enhancements to the model, including improving the simulation of hourly hydro capability, incorporating reserves into an optimized dispatch to reflect the interaction between assignment of reserves and other system capacity obligations; improving market representation to reflect the trade-off between decisions made for economics and adequacy; and, including

fuel accounting and forecast error to represent limitations on operators in dispatching the system.

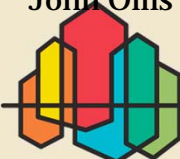
Workplan: A.6.1 Complete testing of the Redeveloped GENESYS, A.6.4 Finalize models for use in the plan after testing.

Background: The GENESYS model is used to assess adequacy, to evaluate the effective load carrying capability of variable generation, and to provide estimates of the power system impacts of various potential scenarios. GENESYS is also used to assess the impacts and costs of non-power related constraints on the regional power system, such as timing and flow restrictions at the dams.

More Info: Summary information and updates are available at <https://www.nwcouncil.org/energy/energy-advisory-committees/system-analysis-advisory-committee/genesys-%E2%80%93-generation-evaluation-system-model>

Redeveloped GENESYS Update

Power Committee
May 2020
John Ollis



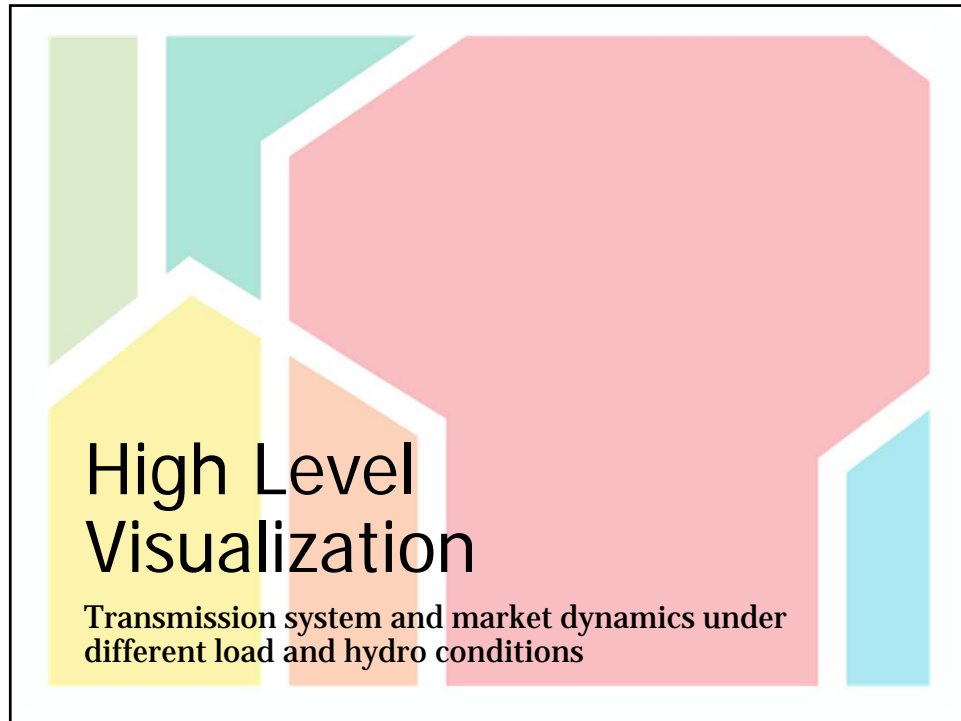
THE 2021
NORTHWEST
POWER PLAN

FOR A SECURE & AFFORDABLE
ENERGY FUTURE

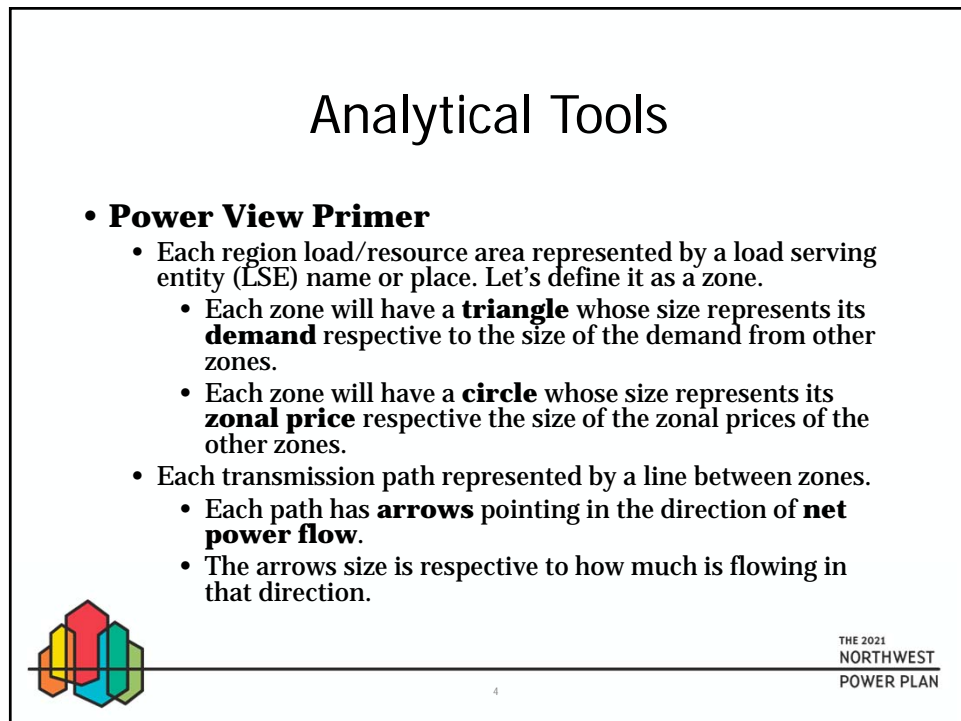
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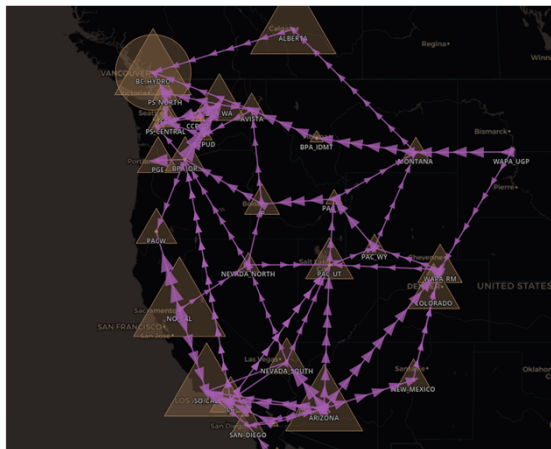


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Low Water, High Load - Winter



- Water:
Critical year
- Regional Load:
High (week before a deficit in BC and multiple northwest nodes)
- Expectation:
Power to be flowing from out of and east side of region going to west side of region and BC high demand

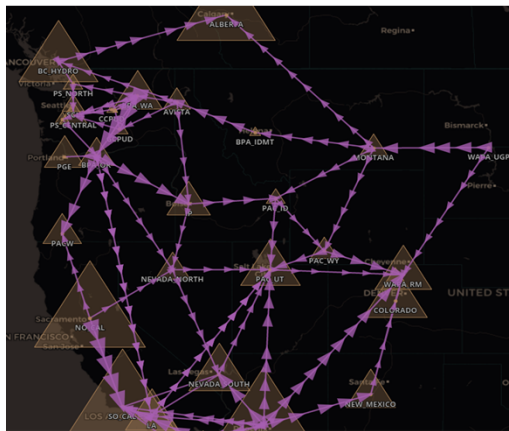


THE 2021
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POWER PLAN

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Average Water, Load - Summer



- Water:
Average in summer
- Regional Load:
Average summer loads
- Expectation:
Power flowing to the hotter portions of the east side of region and to the high demand areas in Southwest and Mountain West

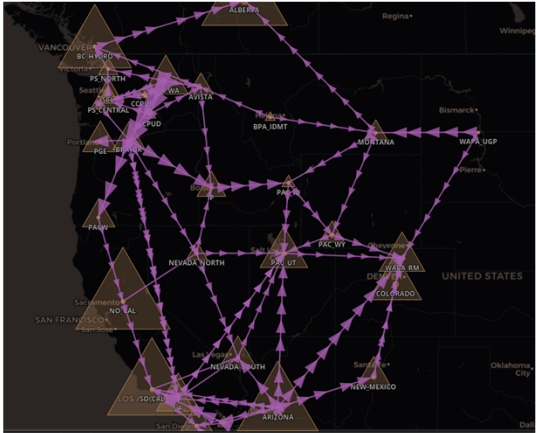


THE 2021
NORTHWEST
POWER PLAN

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High Water, Average Load - Spring



- Water:
High in spring
- Regional Load:
Average spring
- Expectation:
Power flowing out of the NW to everywhere else



THE 2021
NORTHWEST
POWER PLAN

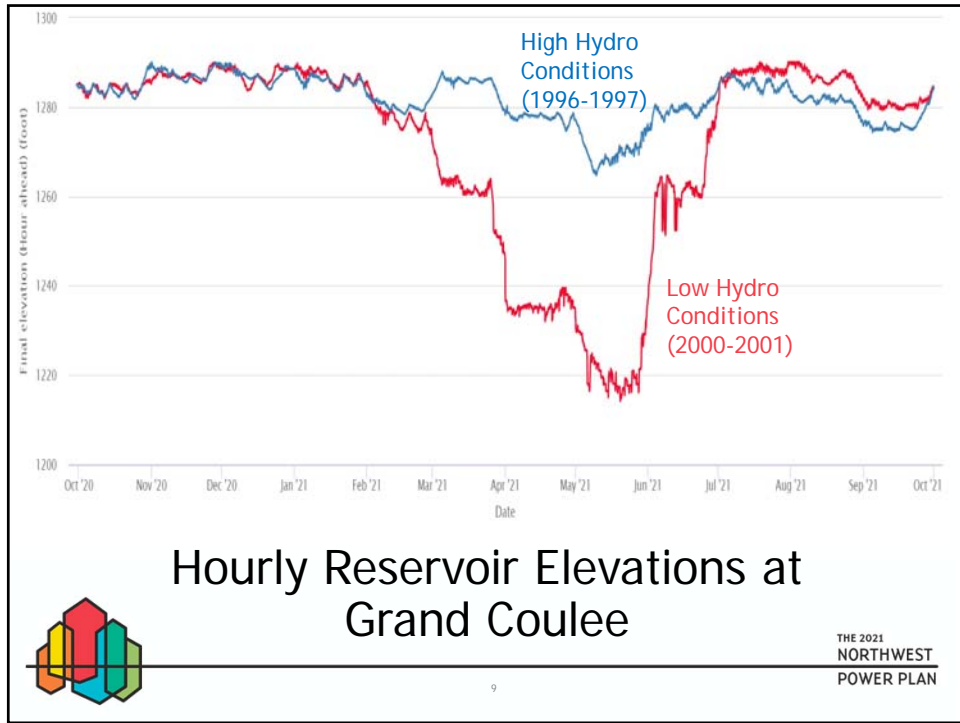
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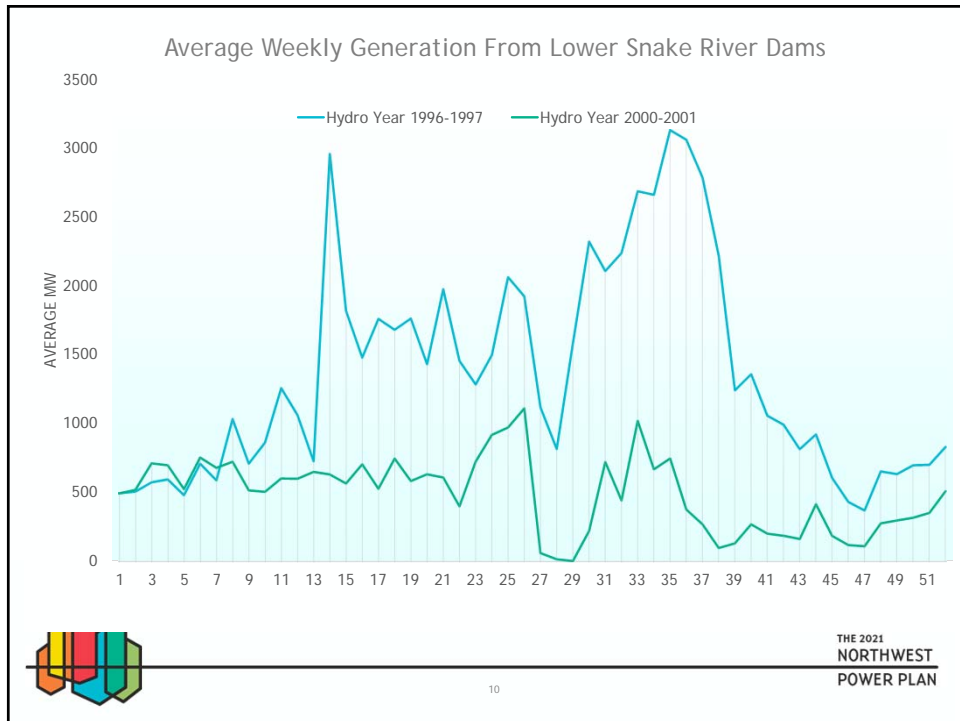
River Operations

Detailed Plant by Plant Operation

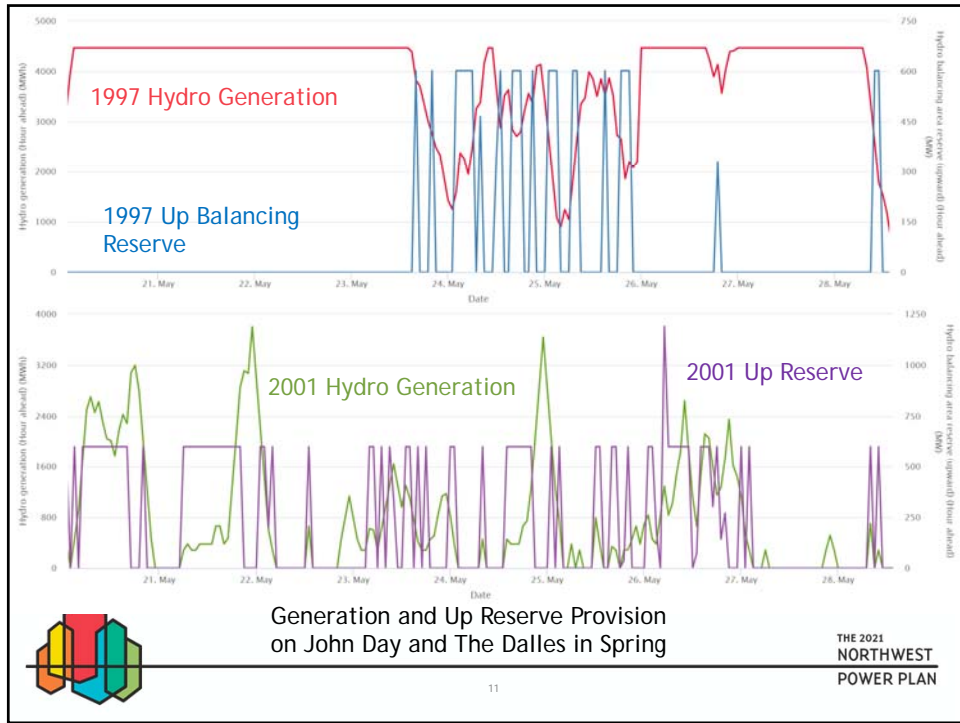
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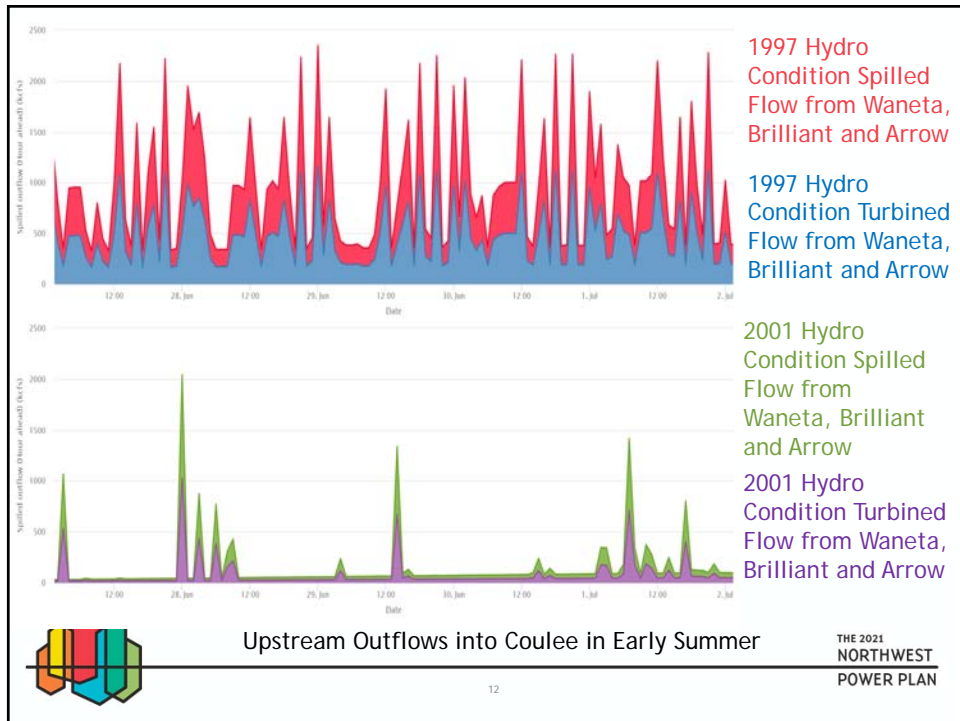
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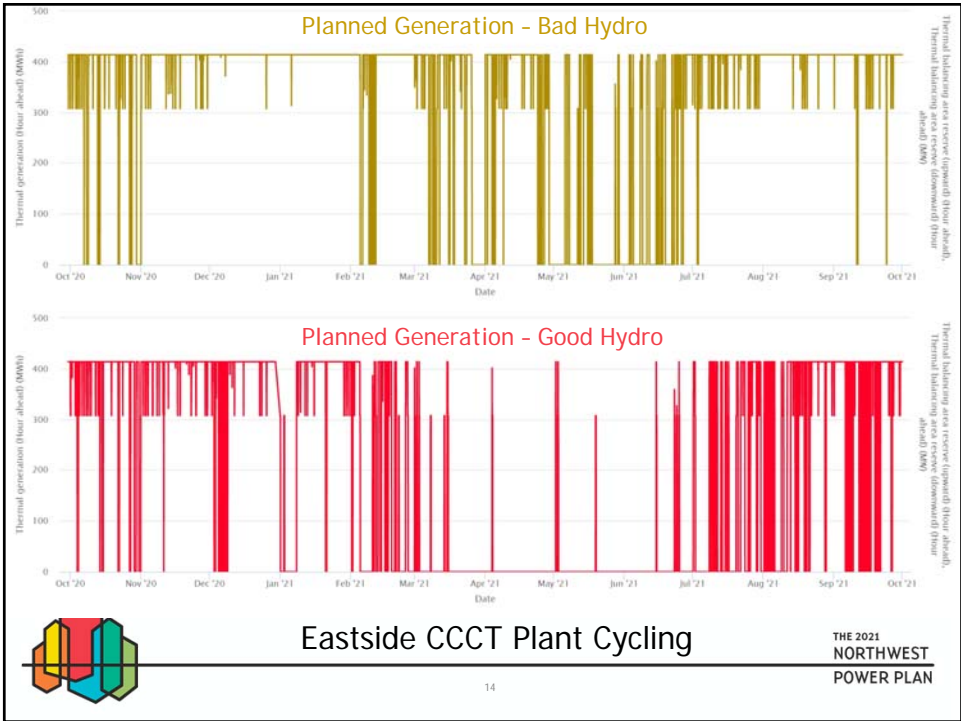
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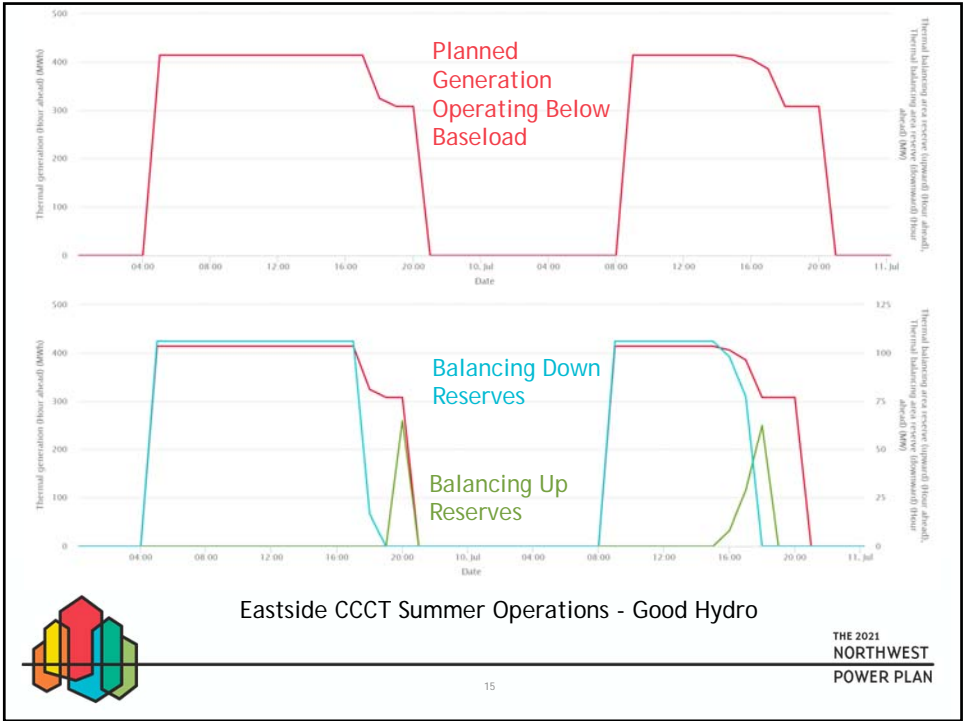
Detailed Thermal Plant Operation

Commitment, generation and reserve provision

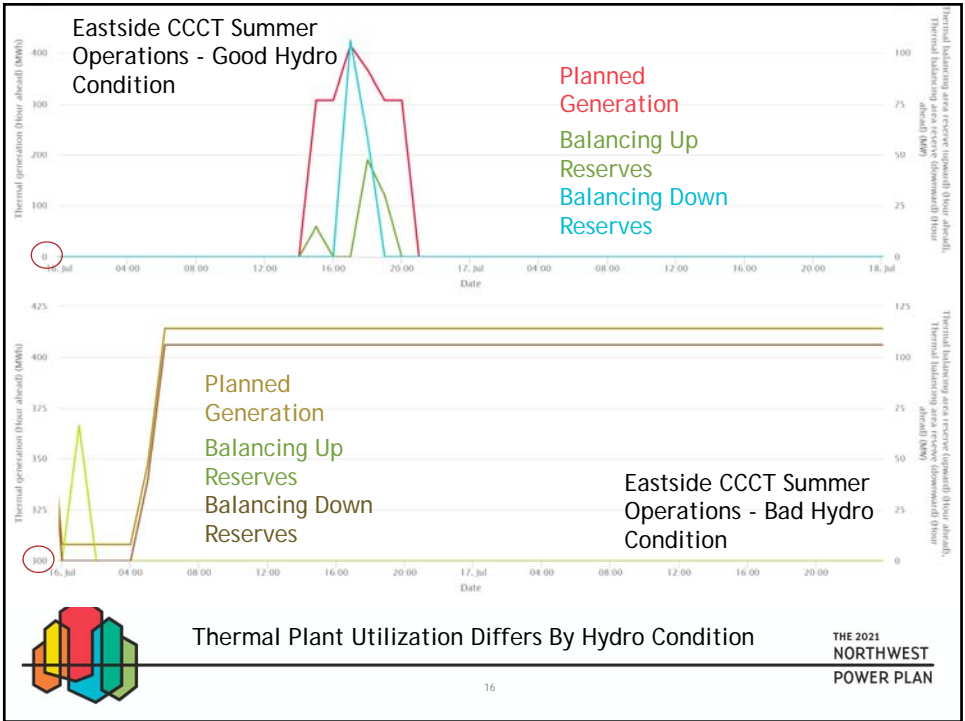
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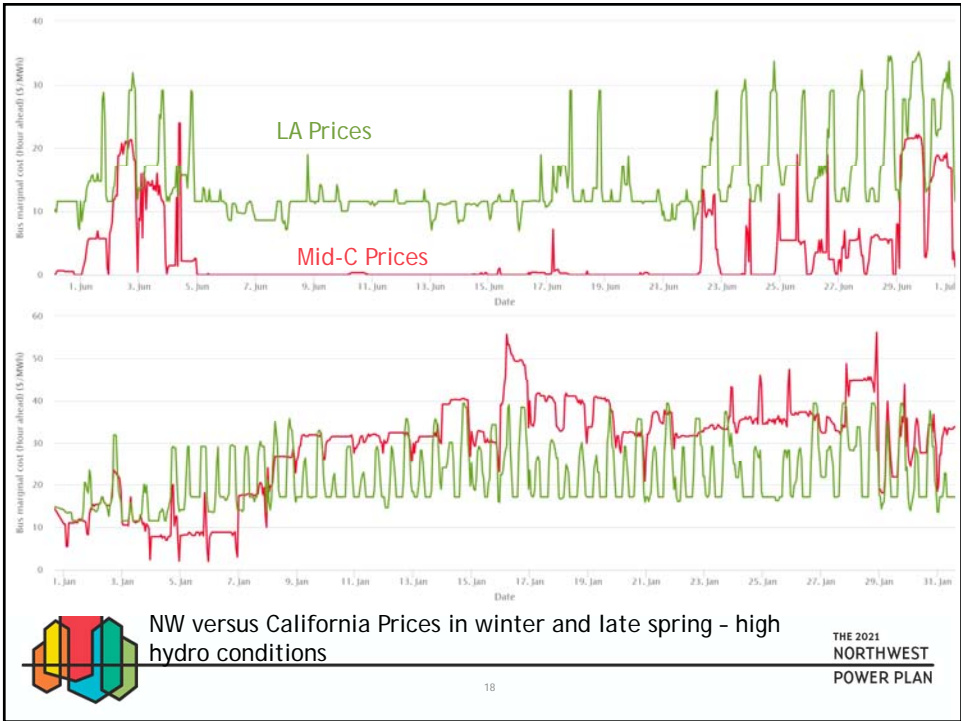
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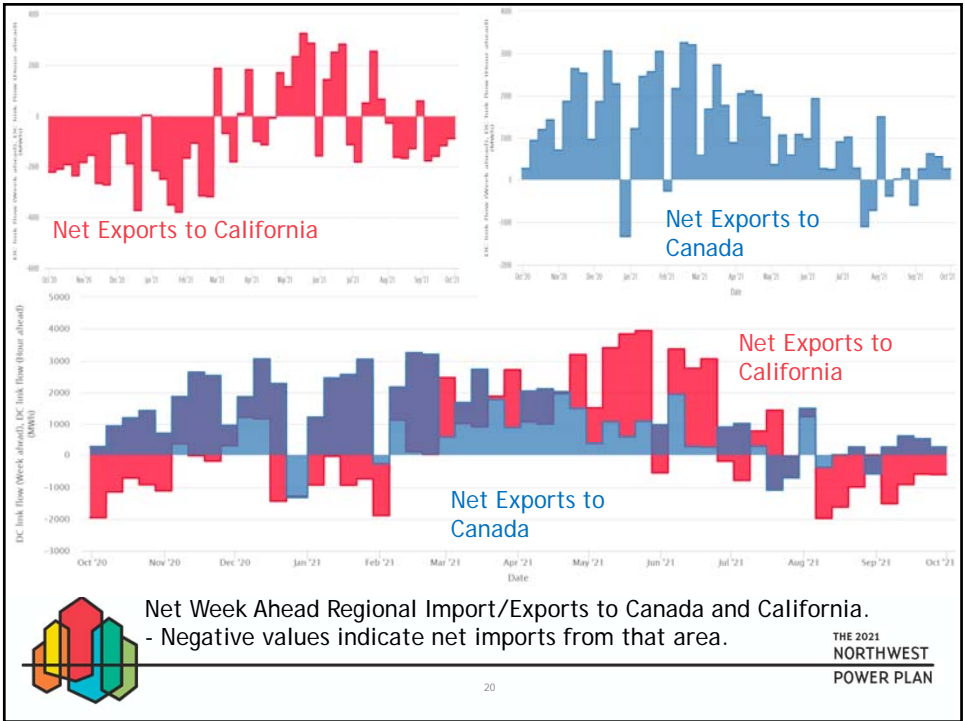
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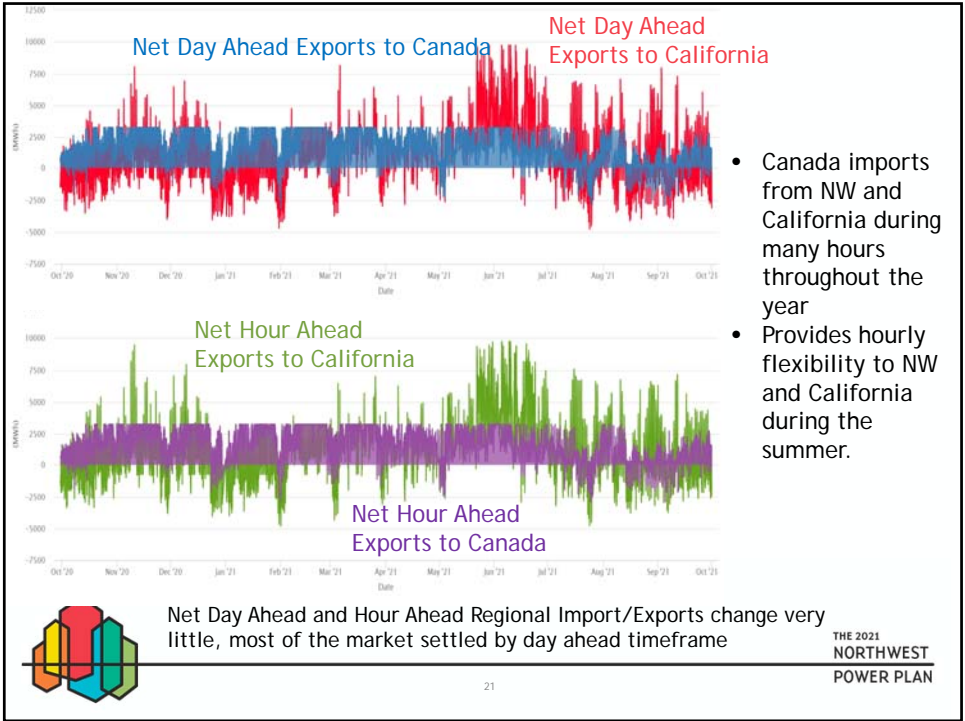
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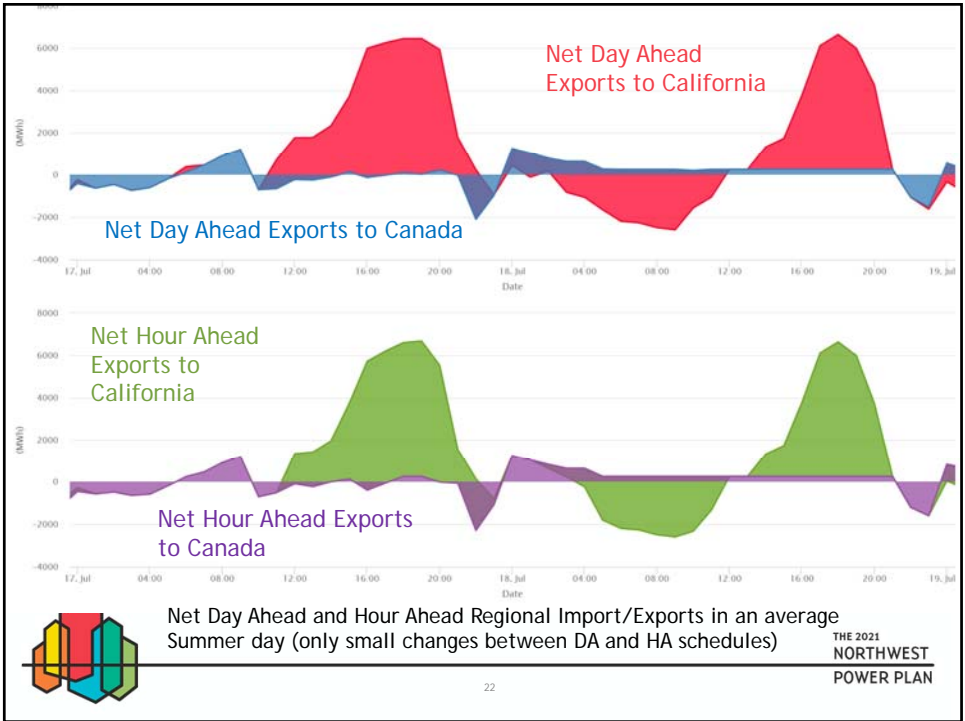
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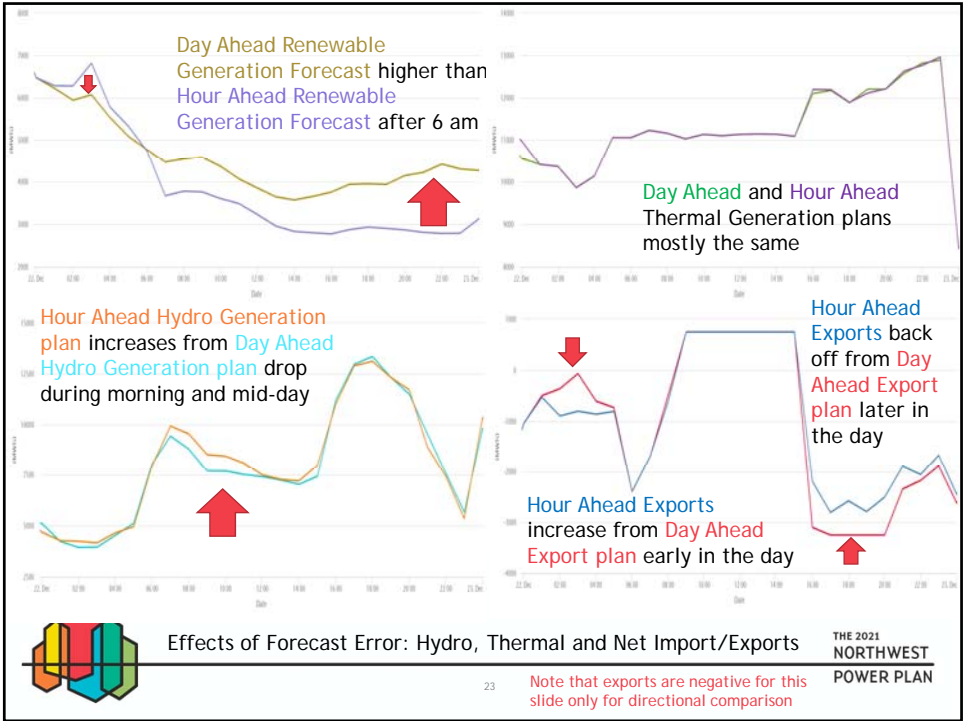
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