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October 6, 2020

MEMORANDUM

TO: Council Members

FROM: John Fazio, Senior Systems Analyst

SUBJECT: NW Power Pool Resource Adequacy Planning Effort

BACKGROUND:

Presenter: Gregg Carrington, Chief Operating Officer, NW Power Pool

Summary: Given the recent trend in decommissioning coal plants and increasing renewable resource integration, the NW Power Pool's Resource Adequacy Group is working to coordinate activities related to a comprehensive review of resource adequacy in the NWPP region, and the development and implementation of a Resource Adequacy Program (RAP). The NWPP will brief the Council on the status of this effort.

Relevance: There are many factors that contributed to the rising interest among Power Pool members to develop resource adequacy criteria. At the most general level, there is a desire on all fronts to avoid a repeat of the crisis in 2000-2001, which had large economic and political impacts. At a more specific level, current dynamics of the hybrid market in the Western Interconnection (WI) introduce uncertainty regarding the adequacy component of reliability; taken together, these dynamics could undermine development of adequate resources.

Workplan: A.5.2 Related to power supply adequacy assessments

Background: Formal and robust resource adequacy programs have been developed in other regions of North America to ensure reliability on a forward-looking basis in the presence of extensive transactions between utilities. These programs enable multiple utilities to reduce costs by realizing significant capacity diversity benefits; that is, by meeting their collective needs jointly,

rather than on a stand-alone basis. At the same time, robust resource adequacy programs ensure that member utilities do not make overly optimistic assumptions about the availability of supply from other utilities, which can expose their customers to potential reliability events. With the Northwest continuing to see significant changes in the region's asset mix, but without a formal regional resource adequacy framework, it has become an increasing challenge for Northwest utilities, their stakeholders and their regulators to accurately assess resource adequacy and to take appropriate actions to maintain adequate power supplies.

NWPP RESOURCE ADEQUACY UPDATE

NORTHWEST POWER AND CONSERVATION COUNCIL

GREGG CARRINGTON, NWPP
OCTOBER 14, 2020



AGENDA

- » Status Update
- » Preliminary Program Conceptual Design
- » E3 Evaluation
- » Questions and Wrap-Up



STATUS REPORT

Status Update

- » Calpine joined the Steering Committee—19 total participating members
- » Completed preliminary program conceptual design
- » Hired Southwest Power Pool in Program Developer role
- » Completed E3 evaluation
- » P99 interim solution go-live
- » Phase 2B: Detailed Design phase launched

Event Table

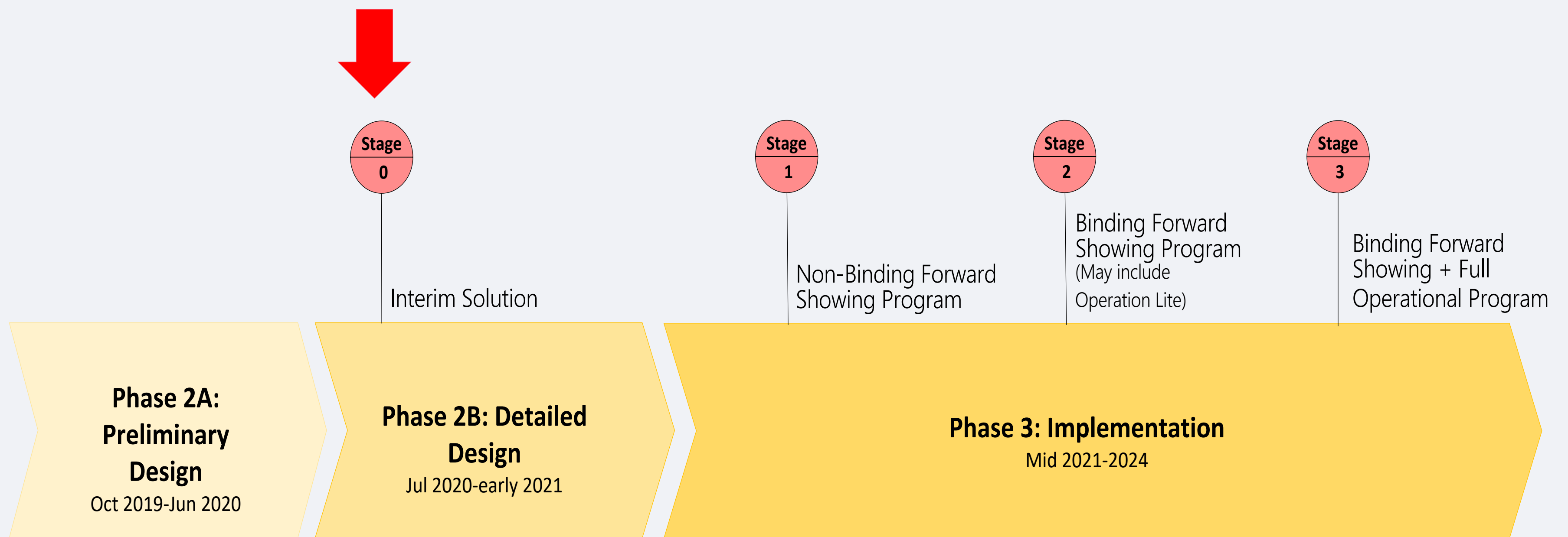
Preliminary Program

Conceptual Design

E3 Evaluation



OVERVIEW OF PROJECT TIMELINE



Status Update

Event Table

Preliminary
Program

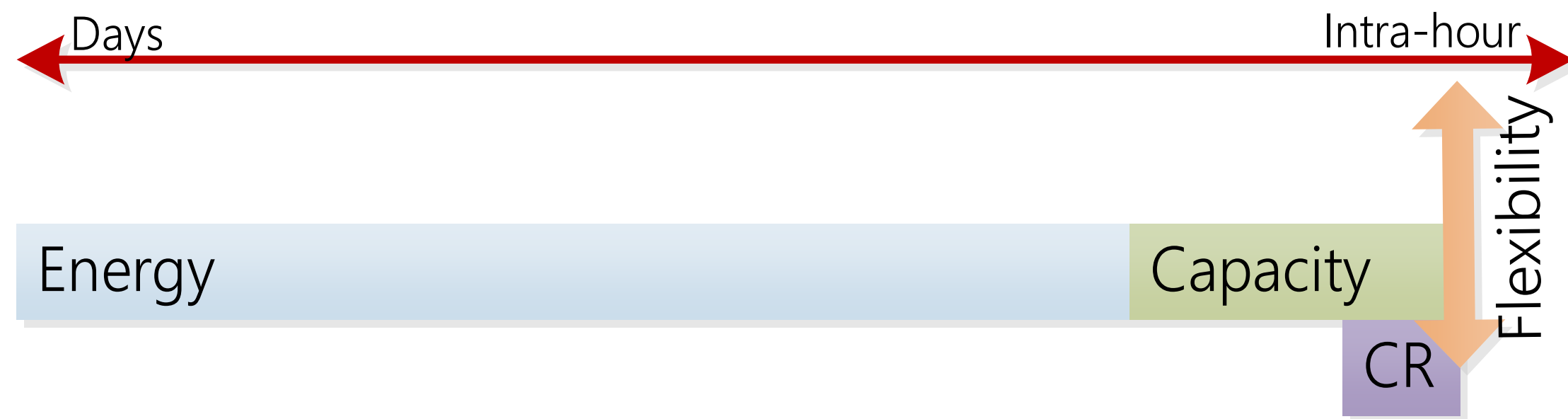
Conceptual
Design

E3 Evaluation

ADEQUACY / RESERVES

EVENT LOCATION

ENERGY	LSE
CAPACITY	LSE
FLEXIBILITY	Balancing Authority / System
CONTINGENCY	Balancing Authority / System



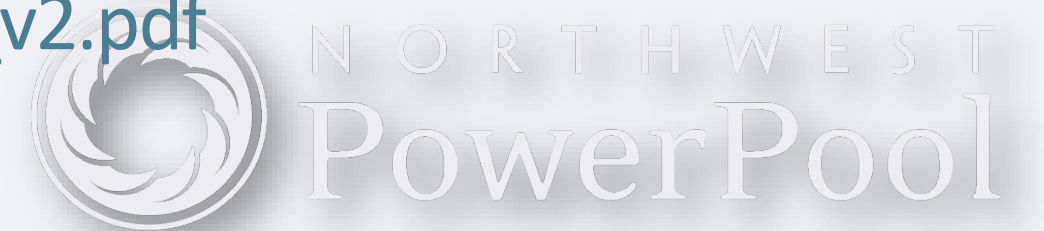
ADEQUACY / RESERVES	EVENT LOCATION	DURATION	DESCRIPTION OF EVENT
ENERGY	LSE	More than a few hours / on the order of days	An LSE's load is greater than available resources, usually due to an extended fuel constraint (including river flows) or extended forced outage. Can extend into multiple days or weeks. May or may not correspond to peak loads.
CAPACITY	LSE	A few hours / on the order of hours	An LSE's load is greater than its resources, due to a lack of availability of generating capacity. This is usually associated with high load events, when an LSE's load is greater than their planning metric (i.e. non-coincident peak load + Planning Reserve Margin), and/or their available resources are not performing to the assumed/planned capacity values (i.e. Qualifying Capacity Contribution values). Usually corresponds to capacity critical hours.
FLEXIBILITY	Balancing Authority / System	Intra-hour or intra-day, depending upon ramping capabilities of resources within a system	A balancing authorities' load or variable generating resources change more quickly than dispatchable resources can cover. This is often indicative of resources ramping and reliability qualities, e.g. if a Variable Energy Resource suddenly ramps down, and the Balancing Authority Area (BAA) does not have other resources that can fill the resource change in a similar time frame.
CONTINGENCY	Balancing Authority / System	Typically less than 60 minutes (for NWPP RSG participants after CR event)	Contingency Reserve (CR) event triggered by declared a loss of a system resource or a system emergency as per NWPP Contingency Reserve Sharing Group. Could occur before, during, or after capacity or energy event. Restoring CR after a CR event is responsibility of individual BAAs and not part of CR event.

CONCEPTUAL DESIGN DOCUMENT

- » Developed 40-page Conceptual Design document published on NWPP Resource Adequacy webpage that discussed
 - Background
 - Project management phases, staged functionality, capacity RA program focus, RA program goals and objectives
 - Forward showing program conceptual design
 - Operational program conceptual design
 - Legal/Regulatory Considerations

- » Today's focus is on forward showing program and operational program conceptual design

*Document can be found at https://www.nwpp.org/private-media/documents/2020-07-31_RAPDP_PublicCD_v2.pdf



Status Update

Event Table

**Preliminary
Program
Conceptual
Design**

E3 Evaluation

Snapshot of NWPP RA Program Preliminary Conceptual Design: *Forward Showing Program*

Market Structure

Bi-lateral; entities will continue to be responsible for determining what resources and products to procure and from where.

Participation

Voluntary to join; joining commits participants to meeting established requirements or incurring penalties (i.e., not “voluntary” to comply once committed) and to an operational program where they are obligated to deliver diversity benefit when called upon. Process will be established to join or leave the program.

Point of Compliance

For further discussion with stakeholders in Phase 2B: Detailed Design. Currently considering obligations at the LSE level.

Administration

Program Administrator will likely have to be a FERC jurisdictional entity to the extent that it administers program elements that are subject to FERC jurisdictions, which means it will also have to meet federal “public utility” standards for neutrality. Phase 2B will also consider multiple layers of program administration that may not require FERC jurisdiction.

Compliance Periods

Two binding seasons: Summer and Winter. Fall and Spring seasons would be advisory (no penalties for non-compliance, but metrics would be provided).

Snapshot of NWPP RA Program Preliminary Conceptual Design: *Forward Showing Program*

Forward Showing Period

Forward showing will occur 7 months in advance of binding seasons, with a 2-month cure period.

Planning Reserve Margin

Seasonal Planning Reserve Margins will be determined for summer and winter periods and expressed as a percentage of the 1-in-2-year seasonal peak load forecast.

Resource Capacity Accreditation

Resource Capacity Accreditation will be based on methodologies appropriate to resource type, including:

1. **Variable Energy Resources:** ELCC analysis
2. **Run of River Hydro:** historical data and ELCC analysis
3. **Storage Hydro:** Common hydro model that considers appropriate set of water conditions allowing Program Administrator to verify data. Phase 2A included development of a conceptual storage hydro capacity methodology, which will be further considered as part of Phase 2B: Detailed Design
4. **Thermal:** UCAP method
5. **Other resource capacity crediting** (e.g., demand-side resource, pump storage, behind-the-meter solar): for further development in Phase 2B: Detailed Design

Penalty for Non-Compliance

Deficiency payment based on CONE for a new peaking gas plant (e.g., SPP's CONE calculation). Further discussions on deficiency payments are anticipated in Phase 2B.

Snapshot of NWPP RA Program Preliminary Conceptual Design: *Operational Program*

Framework for Accessing Pooled Capacity

Accessing Entity:

- › Can only call on pool capacity when Load + Contingency Reserves > Forecasted peak load + PRM –forced outages – VER underperformance +VER over-performance
- › Participants can only access pooled capacity equal to the amount of load over their reliability metric

Providing Entity:

- › Administrator will ask those not experiencing loads over their RA obligations assist
- › Could request the difference between their RA obligations and forecasted load

Transmission and Deliverability

- › Will require modeling to identify any transmission considerations in the operational time frame
- › Recommendations associated with transmission availability in the operational time horizon will be made in Phase 2B.

Delivery Failures

- › No specific recommendations on penalties for delivery failures
- › Program administrator is responsible for identifying and reporting delivery failures

E3 Evaluation

- » E3 developed an excel spreadsheet workbook comprised of load and resource data from each entity and relied upon prior loss-of-load probability modeling in the Northwest to estimate capacity contributions for resources, providing a template for resource qualification
- » Topics explored
 - *Mechanics of calculating capacity needed to achieve the RA target – a PRM was not calculated*
 - *Possible methodologies for distributing that capacity need across the participants in the program*
 - *Mechanics of assessing capacity contributions of various resource types to count toward the RA capacity need – specific capacity contributions for each resource type were not calculated*
 - *How imports/exports to other regions impact the region's RA projections*
 - *The benefits of looking at RA as a region vs. individual participants*

Status Update

Event Table

Preliminary

Program

Conceptual

Design

E3 Evaluation

E3 EVALUATION FINDINGS

- » The E3 process provided a strong foundation of data collection and understanding for the relationship of different data elements
- » Regional capacity requirement reduction of approximately 3% or 1700 MW is available through tapping into the load diversity of the footprint - additional savings will accrue for supply diversity which will be considered in the next phase of analysis and work
- » Created tool to help stakeholders better understand the mechanics of a resource adequacy program forward showing process and build intuition about possible impacts on their utilities
- » Available on www.nwpp.org/adequacy



QUESTIONS