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July 5, 2023

MEMORANDUM

TO: Council Members

FROM: Jennifer Light, Director of Power Planning

SUBJECT: Western Resource Adequacy Program Update

BACKGROUND:

Presenter: Ryan Roy, Director of Operations & Technology, Western Power Pool

Summary: The Western Resource Adequacy Program (WRAP) is a reliability and regional planning program for the Northwest, managed by the Western Power Pool. At the August 2022 Council meeting, Sarah Edmonds, President and CEO of the Western Power Pool, provided an overview of the WRAP, highlighting the program design and the development timeline. Since then, FERC approved the WRAP tariff outlining the programs provisions and requirements, which helped clear the way for full implementation.

At this meeting, Ryan Roy will provide the Council an update about the WRAP and its activities. Ryan will also touch on the connection between the WRAP and the Council's planning efforts, and where collaboration between our staffs will provide value to the region.

Relevance: The Council and WRAP both have in their mandate resource adequacy. For the Council, the focus is on long-term planning to develop 20-year power plans that provide recommendations to Bonneville and the region on resources needed to ensure an adequate, efficient, economical, and reliable power supply. Through its annual adequacy assessments, the

Council is able to build on these long-term plans by providing important feedback to the region on whether near-term resource acquisition is sufficiently on pace to ensure longer-term resource adequacy. The WRAP focuses more on near-term resource adequacy. The program is designed to send clear signals about resource gaps that need to be filled today to ensure resource adequacy in the coming year. In many ways, the WRAP provides an important mechanism for implementing elements of the Council's power plan.

Workplan: Track market efforts to inform Council analysis.

Background: Unlike other parts of the country, the Northwest does not have a Regional Transmission Organization (RTO) or an Independent System Operator (ISO) that provides resource adequacy planning and compliance frameworks. Instead, planning for and ensuring resource adequacy falls on a mix of entities. The Council develops a regional power plan that provides direction to Bonneville and the region to ensure regional system adequacy, among other things. At the time of the passage of the Northwest Power Act, the thinking was that Bonneville would be the primary entity acquiring resources to serve regional load. The reality, however, is different as Bonneville serves less than half of the regional power loads in the Northwest. This results in a mix of entities, ultimately responsible for ensuring regional resource adequacy in this region.

In the late 2010s, utilities across the region were facing rising concerns about resource adequacy. This led to industry calling on the Western Power Pool to take up an effort to address these resource adequacy concerns. Rather than waiting for a fully integrated market solution through an RTO or an ISO, the region wanted to develop its own solution to ensure resource adequacy. This ultimately led to the development of the WRAP.

The WRAP is a voluntary program with a footprint across the west. At a high level, there are two important parts of the WRAP program. The first is the forward showing phase, which is essentially a planning phase for the participants in the program. This phase takes place seven months ahead of each summer and winter season. At this point in time, participants demonstrate that they meet the program requirements for adequacy, using consistent assumptions and a single planning reserve margin for the region. The use of consistent assumptions across all participants helps to ensure that the right signals are being sent regionally. Additionally, the WRAP program includes penalties for not meeting requirements that it expects are significant enough to ensure that resources needed for adequacy are acquired.

The second part of the program is the operations phase during the summer and winter of each year. During these time periods, the WRAP evaluates a nearer term forecast of load and resources relative to the

forward showing commitments to identify any utilities that might be surplus or deficit. For example, one utility that has done everything correctly in planning and acquiring resources consistent with the requirements for the forward showing might still have loads show up in real-time that are higher than expected. Since the entire footprint of the WRAP has planned in the forward showing to account for the total load plus a planning reserve margin to maintain adequacy there will most likely be another utility with available surplus. The utility that finds itself short in the operational time period would then be matched with one or more of the utilities showing surplus, and those utilities can then leverage the existing bilateral trading mechanisms used in the region to support the real-time operations of the system.

As described above, one key feature of the WRAP is using consistent assumptions across the participants during the forward showing phase. To ensure that the Council's longer-term planning efforts and adequacy assessments are supportive of and complementary to the work of the WRAP, it is imperative that both entities develop a common understanding of assumptions and an ability to crosswalk between each other's analysis where these assumptions are not yet consistent. Since the Council and WRAP assess adequacy over different regional footprints (the region as defined by the Power Act versus a larger western footprint) one would expect slightly different adequacy assessment perspectives. Additionally, the two organizations have different mechanisms to adopt and evaluate adequacy metrics. While the Council relies on feedback from advisory committees and Council Members have the final decision, the WRAP is participant-driven, and changing metrics requires intent and agreement from program participants. That being said, Council and WPP staff had had multiple conversations on the topic of metrics and are committed to working to ensure this mutual understanding for regional clarity and consistency in planning.

More Info: Sarah Edmonds, President & CEO of the Western Power Pool, presented to the Council in August 2022 to provide an overview of the WRAP. Those materials are available here:
https://www.nwcouncil.org/fs/17855/2022_08_3.pdf.



WESTERN RESOURCE ADEQUACY PROGRAM

July 12, 2023

Ryan Roy

Director of Operations and Technology

CURRENT PARTICIPANTS

Arizona Public Service

Avista

Bonneville Power Administration

Calpine

Chelan County PUD

Clatskanie PUD

Eugene Water & Electric Board

Grant PUD

Idaho Power

Northwestern Energy

NV Energy

PacifiCorp

Portland General Electric

Powerex

Public Service Company of New Mexico

Puget Sound Energy

Salt River Project

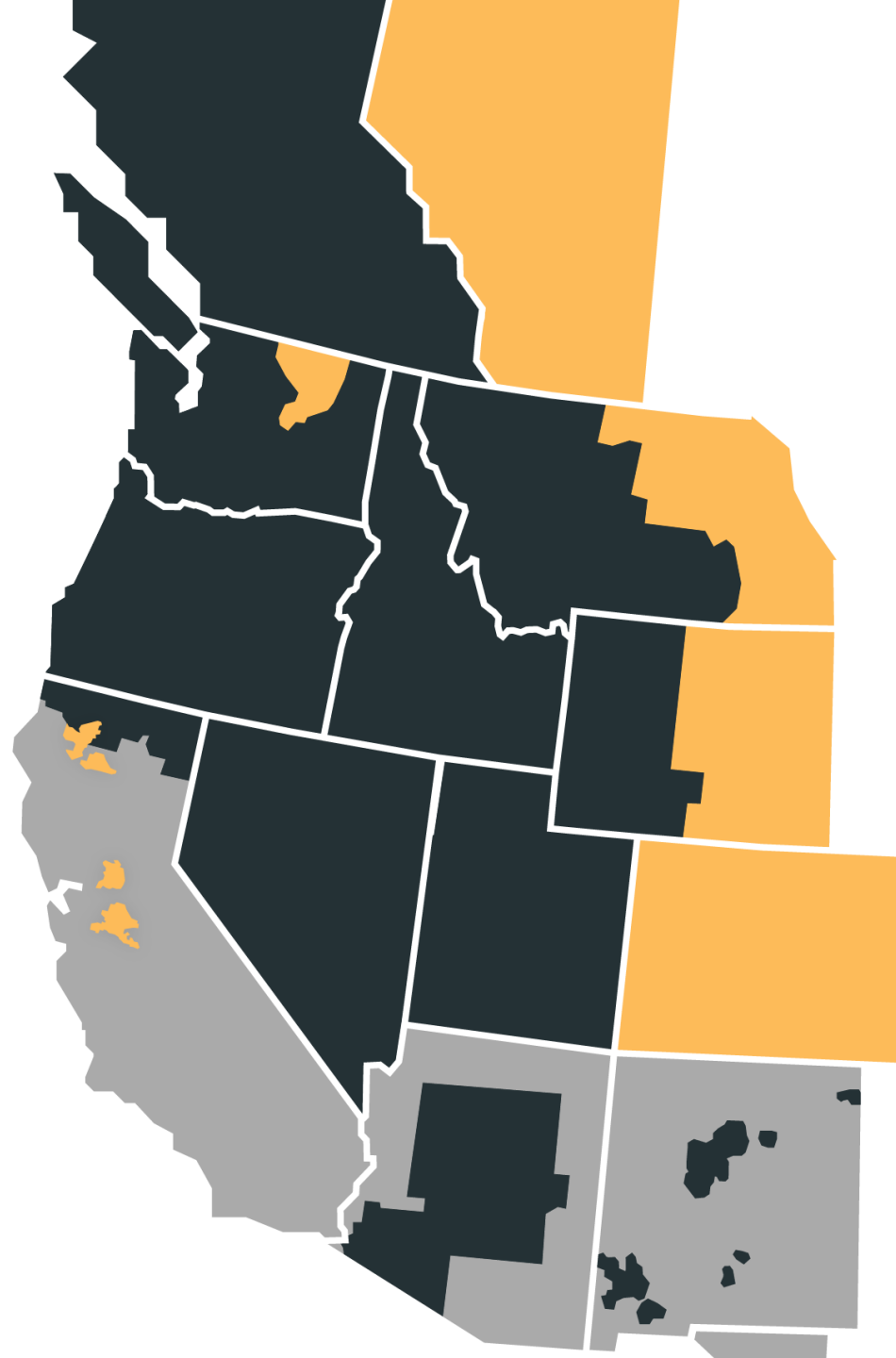
Seattle City Light

Shell Energy

Snohomish PUD

Tacoma Power

The Energy Authority



WRAP LOAD

Winter Peak

61,600 MW

70% of WECC load
excluding CA+ Mexico and
AESO region

Summer Peak

68,900 MW

69% of WECC load
excluding CA+ Mexico and
AESO region

ADDITIONAL
WPP FOOTPRINT

NON-WPP FOOTPRINT

CURRENT WRAP
FOOTPRINT

IMPLEMENTATION AHEAD

Non-Binding Forward Showings

Winter 22-23* through Winter 24-25 *W22-23 and Summer 23 completed in 2022

Transition Seasons (Ops and FS)

Summer 25 through Winter 27-28



2023 Focuses:

- » Standing up tariff-approved governance (new board, stakeholder process)
- » Business Practice development, review, and approval
- » Implementation of the Non-Binding Operations Program
- » Work with WRAP participants and market operators about market interoperability

Binding Program Without Transition Provisions

Summer 28 and all seasons following

ITEMS IN PROGRESS

Forward Showing

- » Reviewing Forward Showings for Winter 24/25
- » Beginning work on Forward Showing technology solution

Operations Program

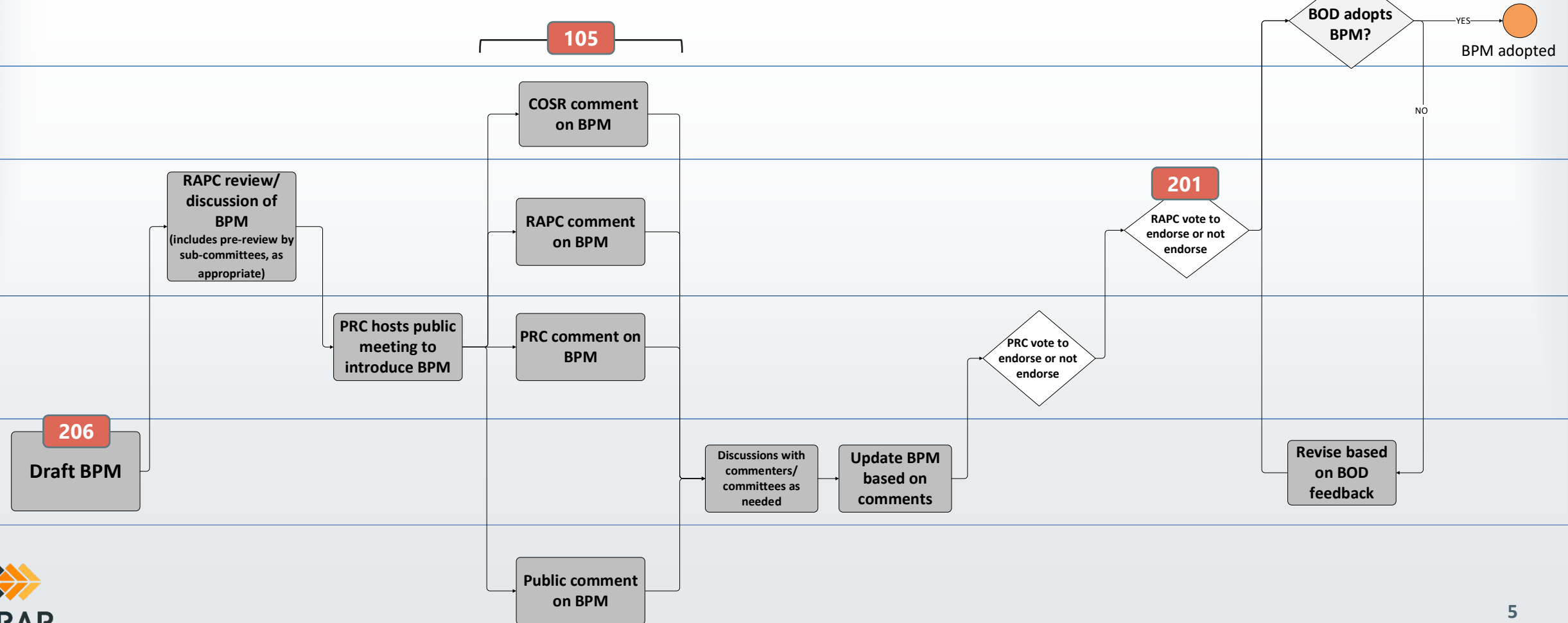
- » Connectivity Testing (June 5 – July 28)
- » Structured Testing (July 3 – August 14)
- » Operations Trials (August 3 – November 1)
- » Summer 2023 Interim RA Program underway

Governance

- » Seated new Board of Directors in February 2023 and hosted first public meeting May 31
- » **Upcoming Board of Directors meeting August 23**
- » Working on first round of Business Practice Manuals

BUSINESS PRACTICE MANUAL REVIEW

*  Denotes the current stage of corresponding BPM



WRAP AND MARKETS

- » WRAP participants are closely **evaluating incremental market alternatives**: CAISO's Extended Day-Ahead Market (EDAM) and SPP's Markets+.
- » WRAP is a standalone resource adequacy program that depends **on firm transmission to ensure reliability and deliver customer benefit**. EDAM and Markets+ also rely on the availability of transmission to deliver market benefits.

How can we ensure WRAP and Markets interact around transmission in a way that protects WRAP's value proposition?

- » WPP recently published a [whitepaper analyzing hypothetical transmission transfer scenarios](#) for WRAP with EDAM and Markets+. The analysis concluded:
 - For EDAM, CAISO has substantially completed its tariff. **CAISO's design gives capacity-backed WRAP RA transactions using firm or conditional firm transmission equal curtailment priority to market transactions in certain circumstances.**
 - For Markets+, substantially more work remains on design and tariff language. SPP points to the curtailment priority design used for its eastern market, which puts transactions using firm transmission above market transactions.
- » WPP urges participants to push for documentation addressing how markets will accommodate transmission used to deliver WRAP capacity. **Durable solutions are possible** but should be **documented in tariff language**.

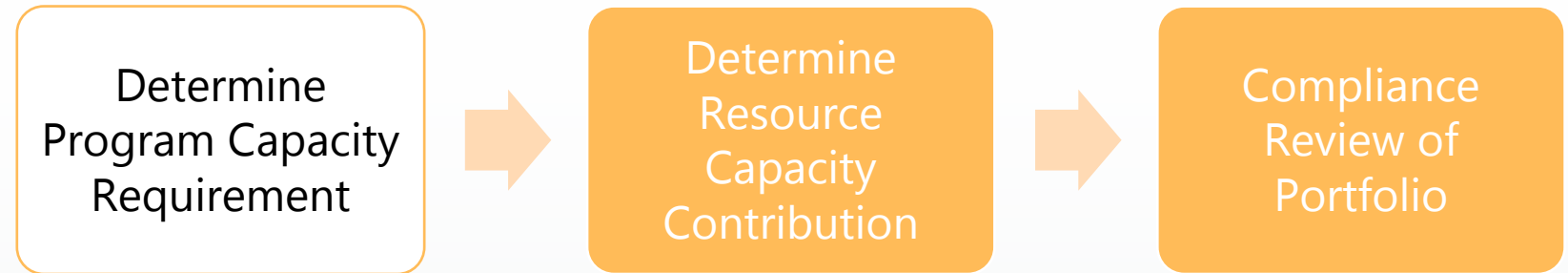
SUMMER 2023 STATUS

- Not enough to have sufficient capacity in total - it must be appropriately allocated to the need
- Absent a program like WRAP there is minimal incentive to ensure capacity aligns with need or to reduce reliance on market imports
- The competition for these imports is significantly increasing
- In an environment where sufficient capacity is not procured on a forward basis and entities cannot receive the benefit of diversity of resources and loads, load will remain at significant risk

APPENDIX

PROGRAM DESIGN OVERVIEW

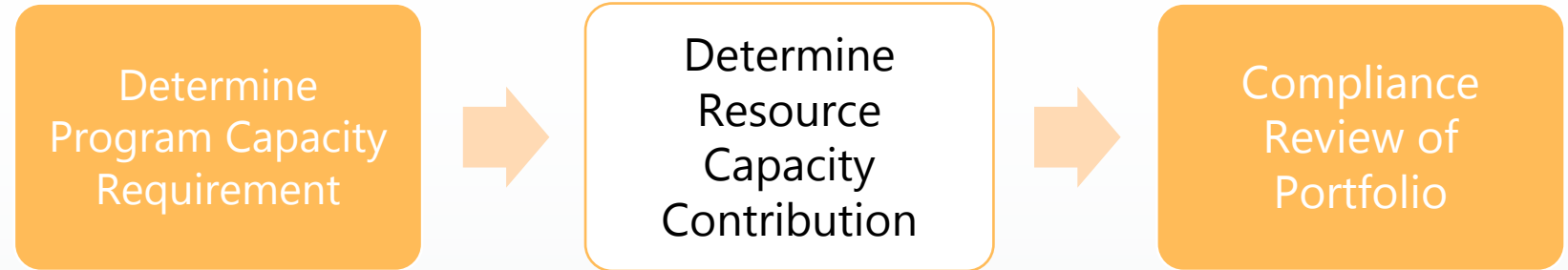
FORWARD SHOWING PROGRAM



- » Establishes a **regional reliability metric** (1 event-day in 10 years LOLE)
- » Utilizes thoughtful modeling and analytics efforts to:
 - » Determine historical summer and winter **capacity critical hours** (CCHs) data sets for the region
 - » Determine each resource type's **qualifying capacity contribution** (QCC) to the regional capacity needs
- » Peak load forecast based on P50 metric; growth rates and other common standards provided by Program
- » Planning Reserve Margin is calculated by SPP and approved by the WPP Board

PROGRAM DESIGN OVERVIEW

FORWARD SHOWING PROGRAM

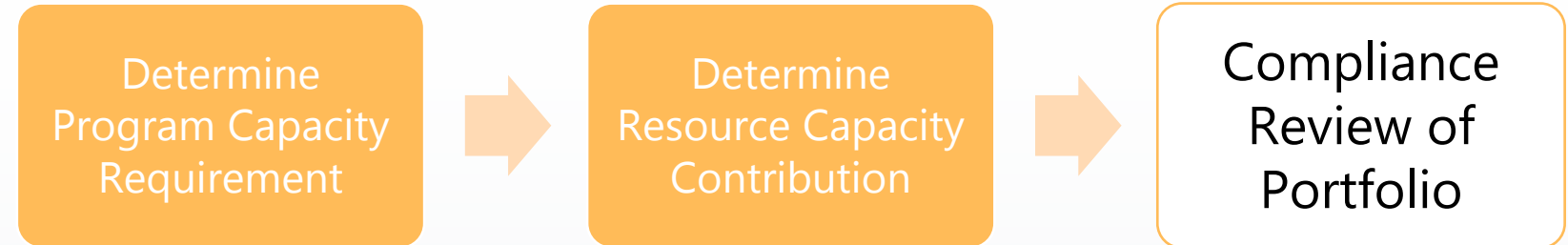


- » **Wind and Solar:** ELCC
- » **Run-of-River Hydro:** Historical performance on CCHs
- » **Storage Hydro:** WPP-developed hydro model that considers the past 10 years generation, potential energy storage, and current operational constraints
- » **Thermal:** UCAP (resource capability is adjusted to reflect historic forced outage rates during capacity critical hours)
- » **Short Term Storage:** ELCC
- » **Hybrid Resource:** "Sum of parts" method - ESR will use ELCC and generator will use appropriate method
- » **Contracts:** resource-specific, not double-counted for other RA, will not be cut before load shed
- » **Customer Side Resources:** load modifier or capacity resource
- » **External Resources (imports):** must be supported by an identified source, an assurance that the capacity is not used for another entity's resource adequacy requirements, an assurance that the seller will not fail to deliver in order to meet other supply obligations, and affirmation of NERC priority 6 or 7 firm point-to-point transmission service rights (or network integration transmission service rights) from the identified source to the point of delivery/load

Resources are registered with and certified by Program Operator to receive a Qualifying Capacity Contribution (QCC) in advance of showing deadlines.

PROGRAM DESIGN OVERVIEW

FORWARD SHOWING PROGRAM



Transmission Showing: participant must show firm transmission rights (minimum of NERC 6 or NERC 7) sufficient to deliver at least 75% of FS Capacity Requirement, in aggregate, from qualifying resources to load

FS Deficiency Charge: based on PO estimate of gas-peaker CONE, employing public information; multipliers based on how deficient the region is as a percentage of total regional capacity need.

» Needed to consider application of CONE in two seasons of same year (June -> May), in program with showings on monthly basis.

PROGRAM DESIGN OVERVIEW

OPERATIONS PROGRAM



- » Evaluates participants operational situation relative to Forward Showing assumptions
- » Obligates participants with calculated surplus to assist participants with a calculated deficit on the hours of highest need
- » Surplus Participant that fails to provide assigned Energy Deployment must pay Energy Delivery Failure Charge
 - Waivers will be available for specific circumstances