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To: WECC

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Subject: Demand Response Resource Modeling Assumptions – High DSM Case

The transmission planning studies conducted by WECC utilize a production cost model (PROMOD) to model the dispatch of generation and demand response (DR) resources in the Western Interconnection. This document offers proposals on several DR modeling-related issues for the WECC High DSM Case, including:

- The expected number of dispatch hours under 1-in-2 conditions for each of the four types of DR resources modeled by WECC (interruptible load, direct load control (DLC), critical peak pricing (CPP) and other pricing programs¹, and load as a capacity resource)
- The approach to “shaping” DR resource levels in order to account for the monthly and hourly availability of each DR program type

SPSC DSM Work Group members have not had an opportunity to review the proposed assumptions and there may be additional recommendations for alternative assumptions. We also anticipate sharing these assumptions with the TEPPC DSM task force. We anticipate working directly with WECC staff in the modeling effort for the High DSM Case in a role similar to our assistance in the Common Case.

Expected Hours of Dispatch

We propose the following dispatch assumptions for these DR resource classes in Table 1:

Table 1. Proposed expected hours of DR dispatch – High DSM Case

DR Resource Class	Expected Dispatch Hours per Year
Interruptible	20
DLC	50
CPP and other pricing programs	80
Load as a Capacity Resource	80

¹ We have expanded the set of pricing programs beyond what WECC includes based on feedback from SPSC DSM Work Group participants and utility staff. These event-based pricing programs include peak time rebate (PTR) and CPP overlays.

Rationale for Dispatch Assumptions

The assumptions regarding expected DR resource dispatch hours per year are based on the following set of considerations:

- **Interruptible programs:** Our assumptions build on the expected hours of dispatch in our Common Case of 10 hours, where we assumed that these programs were utilized primarily for reliability-based events and are therefore rarely dispatched under 1-in-2 conditions. In a High DSM scenario, we assume these resources will be dispatched somewhat more frequently for economic conditions. We assume 20 hours of dispatch in a normal year (i.e., 4-5 interruptions per year, of 4-6 hours per event).
- **Automated or direct load control (DLC) programs:** Similar to the Common Case, we assume that most DLC programs can be dispatched for both reliability and economic purposes. We see no reason to believe a High DSM scenario, with higher levels of DR resources, will result in more frequent use of automated or direct control programs. We expect that utilities will continue to dispatch these programs up to 10-12 times per year, for 4-5 hours per event – or 50 hours per year.
- **Dynamic pricing and other DR programs:** The most significant advancement in DR resource utilization in a High DSM scenario will likely come from dynamic pricing and aggregator managed DR programs. These DR programs are becoming more prevalent as wholesale markets begin to create DR-specific market rules and customers become more aware of managing energy costs. In the Common Case, DR resources in these two classes were reported only by CAISO; all other balancing authorities reported only interruptible load or direct load control (DLC). In the High DSM Case, we assume that all WECC Balancing Authorities (BAs) include some type of these programs by 2022, dispatched for both reliability and economic purposes. For dynamic pricing programs (e.g. critical peak pricing), we assume that participants receive discounted rates during off-peak hours, and that in order to maintain revenue neutrality, utilities will come close to maximizing the number of dispatch hours each year, even under 1-in-2 conditions. Similarly, for aggregator managed DR programs, we assume that participating customers receive a capacity-based “reservation” payment, and that therefore utilities will also dispatch these DR resources relatively frequently, even during a 1-in-2 year, driven in part by the fact that many of these resources are “performance-based” contracts in which the aggregator bears a risk of achieving savings. For both dynamic pricing and other DR programs, we assume 80 expected hours of dispatch in an average year, based on our assumptions in the Common Case and expected advancement of these programs in the High DSM Case.

Monthly and Hourly Shaping Factors

The availability of DR programs varies by month and by hour, for some programs. It is important to capture this availability in the modeling of DR resources, in order to ensure DR programs typically used during system peak months and hours are not utilized at full availability in non-system-peak months and hours.

The High DSM Case non-firm load data has been developed on an annual non-coincident peak basis, therefore it is necessary to specify monthly and hourly availability for the DR resources. We propose using the same monthly and hourly availability factor as in the Common Case, which assumes DR resource availability scales with load (i.e., hourly DR capacity is a function of monthly system peak).