

High DSM Scenario Request for the 2011 TEPPC Transmission Expansion Plan (and Treatment of DSM in Reference Case/Other Scenarios)

Recommendation of the State/Provincial Steering Committee DSM Working Group
Jan. 25, 2009

At the November 6, 2009 meeting of the State-Provincial Steering Committee (SPSC), the SPSC agreed that it would submit a high DSM scenario to TEPPC and requested that the DSM Working Group prepare the request, for review and approval by the SPSC. This document outlines the approach recommended by the DSM Work Group for developing a high DSM scenario, to be modeled in the 2011 TEPPC 10-Year Transmission Expansion Plan.¹

In addition, the DSM Working Group has developed recommendations for the treatment of DSM in the reference case and two scenarios (Carbon Reduction and Breakthrough Technology) proposed by the Scenario Working Group.

Table 1 sets for the recommended approach for these items, for energy efficiency (EE), demand response (DR), combined heat and power (CHP) and distribution system efficiency upgrades. These recommendations have been informed by the technical assistance of Lawrence Berkeley National Laboratory (LBNL) and the non-state officials participating in the DSM Working Group, as well as the state official/commissioner members of the Group.

A major effort will be assembling and reviewing existing reports to assist in development of the DSM input assumptions. This effort will be ongoing and will likely identify data gaps that will need to be addressed in future analytical work.

Background

In 2008, WIRAB² developed a high energy efficiency scenario that was included within the 2008 TEPPC transmission expansion study. This high efficiency scenario was derived from the energy efficiency goal established by the Western Governors' Association Clean and Diversified Energy Initiative. The scenario stipulated roughly a 14% WECC-wide reduction in electricity use in 2017, relative to the TEPPC base-case load forecast.³ The WECC-wide annual savings were allocated to each state/province, with higher percentage savings levels assumed for states/provinces that historically have

¹ Following TEPPC's convention, we refer to study cycle beginning in 2010 as the "2011 plan", as completion of the report is expected to occur in 2011.

² Found at <http://www.westgov.org/wirab/index.htm>

³ The energy efficiency goal established by the Clean and Diversified Energy Initiative was equal to roughly a 20% reduction in WECC-wide electricity consumption in 2020, relative to a Reference Case based on a modified version of EIA's AEO2005 reference case.

had less-aggressive energy efficiency policies and programs.⁴ Once the annual electricity savings percentage was determined for each state, the hourly load shape for each load bus within the state was reduced by that percentage value.

Overview of Proposed Approach

For the 2011 TEPPC Transmission Expansion Plan, the DSM Working Group proposes to develop a high DSM scenario that will be constructed by aggregating the results from recent potential studies conducted within the region. The high DSM scenario will include end-use energy efficiency and demand response resources, and depending upon data availability, may also include distribution system efficiency upgrades. In future study cycles, the high DSM scenario may also include combined heat and power and distributed generation; however, time and resource constraints preclude the inclusion of these resources in the scenario for the 2011 study.

- *End-Use Energy Efficiency*: The end-use energy efficiency component of the scenario will be based on achieving the maximum achievable economic potential within the 10-year timeframe of the transmission expansion plan. As noted above, the resource potential will be derived by applying the results from recent energy efficiency potential studies conducted for states and utilities throughout the region. In cases where recent and/or high-quality energy efficiency potential studies are not available for a given load bubble, results will be extrapolated based on potential studies from similar regions.
- *Demand Response*: Demand response resources will be specified for each load bubble, based on the state-level DR potential estimates in the recent FERC study, *A National Assessment of Demand Response Potential*⁵. That study specifies several different scenarios that posit different levels of penetration for dynamic pricing, direct load control, and event-based DR programs; the penetration rates for dynamic pricing tariffs assume a corresponding availability and deployment of advanced metering infrastructure (AMI). As a default for states other than California, the size of the DR resource will be based on FERC's Expanded Business-as-Usual scenario, which assumes that the current mix of DR programs is expanded to all states and achieves best practices levels of participation and performance, along with a modest increase in demand response from dynamic pricing. For California, the DR resource potential will, instead, be based on FERC's Achievable Participation scenario, which assumes that AMI is universally deployed, dynamic pricing is the default tariff, and non-pricing programs are available to those who decide not to enroll in dynamic pricing. Any other state that wishes to craft an alternative DR scenario above the default is welcome to. Idaho and Colorado have already expressed the intention to do this. The figure below presents the FERC Scenarios we are drawing upon.

⁴ Specifically, a 12% reduction in 2017 was assumed for California, the Pacific Northwest states, and Canadian/Mexican provinces; while either a 17% or 19% reduction was assumed for Southwestern and Rocky Mountain states.

⁵ Find at http://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf#xml=http://search.atomz.com/search/pdfhelper.tk?sp_o=2,100000,0

Figure 1: FERC Demand Response Scenarios

Assumption	Business-as-Usual	Expanded BAU	Achievable Participation	Full Participation
AMI deployment	Partial Deployment	Partial deployment	Full deployment	Full deployment
Dynamic pricing participation (of eligible)	Today's level	Voluntary (opt-in); 5%	Default (opt-out); 60% to 75%	Universal (mandatory); 100%
Eligible customers offered enabling tech	None	None	95%	100%
Eligible customers accepting enabling tech	None	None	60%	100%
Basis for non-pricing participation rate	Today's level	"Best practices" estimate	"Best practices" estimate	"Best practices" estimate

- *Distribution System Efficiency Upgrades:* The Pacific Northwest Planning Council has characterized savings potential from distribution system upgrades; however it is unclear if this information is available for other states in the West. As part of our review of EE potential studies, the DSM Work Group will assess whether distribution system efficiency upgrades can feasibly be included in the high DSM scenario and examine issues associated with extrapolating the distribution savings potential results from the Pacific NW to other states. If not feasible for the 2011 Study, distribution system upgrades could potentially be included in a high DSM scenario for future study cycles.
- *Combined Heat and Power:* Although an important strategy for energy efficiency and load reduction, including CHP in this study request presents a degree of challenge greater than can be expected to be overcome. In future study cycles, the high DSM scenario may also include CHP and also perhaps distributed generation. Currently the best resource for CHP data is the 2006 Study prepared for the Clean and Diversified Energy Advisory Committee⁶.

Preliminary List of Data Sources:

- NPPC 6th Power Plan (Pacific Northwest states)
- Itron potential study and Itron goals update study (California)
- SWEEP/ACEEE potential studies (Utah, New Mexico)
- Xcel potential study (update expected end of 2009)
- Tri-State potential study (expected completion in February 2010)
- Nevada Power program potential study
- PacifiCorp 2007 potential study (possibly updated in 2010)
- McKinsey U.S. Potential Study (“Unlocking EE in the U.S. Economy”), which contains WECC-level results
- EPRI U.S. Potential Study, which contains WECC-level results
- FERC: A National Assessment of Demand Response Potential
- CA Energy Efficiency Strategic Plan

⁶ Find at <http://www.westgov.org/wga/initiatives/cdeac/CHP-full.pdf>

Data sources across the High DSM Scenario and the three proposals from the Scenarios Working Group

Table 1. Approach to treatment of DSM resources for Reference Case and Alternative Scenarios*

	Reference Case	Carbon Reduction		Technological Breakthrough	High DSM (EE-DR)
Year(s) Covered	Through 2020	Through 2020	Through 2030	Through 2030	Through 2020
Study Year	2011	2011	2011	2011	2011
Energy Efficiency (EE)	Utility IRP with review from state regulatory body	Economic Potential (provided by DSM WG)	Technical Potential (provided by DSM WG)	Technical Potential (provided by DSM WG)	Economic Potential (provided by DSM WG)
Demand Response (DR)¹	Utility IRP with review from state regulatory body	Same as Reference Case	Extrapolated from Reference Case	Technical Potential (provided by DSM WG)	FERC DR National Potential study (Use “Expanded Business as Usual” scenario as default. States may opt to craft unique scenario. CA will use FERC’s “Achievable Participation” scenario ⁴ .)
Combined Heat & Power (CHP)²	Utility IRP with review from state regulatory body	Same as Reference Case	Extrapolated from Reference Case	Same as Reference Case	Same as Reference Case for 2010 (expand in 2011 revision)
Distribution System Upgrades³	Utility IRP with review from state regulatory body	Placeholder (under consideration by DSM WG)	Placeholder (under consideration by DSM WG)	Placeholder (under consideration by DSM WG)	Placeholder (under consideration by DSM WG)

NOTES:

* Scenario Input comparison summarizes proposed approaches for treatment of different types of DSM resources for the 2010 and 2011 WECC TEPPC Study cycle. We assume that Reference Case and High-DSM case will be conducted in both 2011 and 2013. We assume that Carbon Reduction and Technological Breakthrough Scenario are conducted in 2011.

1. DR resources include multiple types of programs and pricing options, some of which require significant investment in enabling infrastructure (e.g. advanced meter rollout to facilitate critical peak pricing or real time pricing for residential and small commercial/industrial customers)
2. CHP – Subject to determination based on availability of suitable economic potential estimates of CHP across region. Due to time and resource constraints, DSM Work Group does not propose significant additional work on characterizing CHP potential for the 2010 study period for alternative scenarios. CHP will be address in more detail in 2013 Study period.
3. Distribution System Upgrades – DSM Work Group will investigate applicability of existing studies done for the Pacific Northwest to other states in the West and consider applying the results of Distribution System upgrade potential from the Pacific Northwest to other states in the West.
4. CA scenario is different from default scenario. It is credible that by 2020 in CA, universal AMI deployment is followed by dynamic pricing as default service for IOUs