

## State-Adjusted Load Forecast: **Montana**

Reviewed by	Date
Galen Barbose (revised)	08/02/10

This document presents the 2020 State-Adjusted Load Forecast recommended by the SPSC DSM Working Group, and describes the underlying analysis. The State-Adjusted Load Forecast will be used in the SPSC Reference Case, and will be the starting point in developing alternate load forecasts for the other scenarios in the SPSC study request. The State-Adjusted Load Forecast recommended by the DSM Working Group is intended to reflect the expected energy savings and peak demand savings from current energy efficiency policies and utility resource plans, based on the methodology and assumptions described in the Reference Case proposal from the DSM Working Group to the SPSC, and incorporating any subsequent guidance from each state/province's designated DSM technical contact.<sup>1</sup>

**We seek approval from SPSC members of the State-Adjusted Load Forecasts shown in Column D of Tables 1 and 2. Please respond to Michael Wheeler ([michael.wheeler@cpuc.ca.gov](mailto:michael.wheeler@cpuc.ca.gov)) by August 4<sup>th</sup> indicating whether the proposed forecast is acceptable, and if not, what specific changes are needed.**

Given the limited time available for making revisions to this analysis, we request that revisions to the analysis be made only if they are likely to have a material impact on the load forecasts at the balancing authority level. Any questions about how the State-Adjusted Load Forecasts were developed that are not addressed within this document should be directed to Galen Barbose ([galbarbose@lbl.gov](mailto:galbarbose@lbl.gov), 510-495-2593).

### **A. Recommended State-Adjusted Load Forecast**

There are three balancing authorities that reside within or overlap with Montana: Northwestern Energy (NWMT), Bonneville Power Authority (BPA), and Western Area Power Administration – Upper Missouri Region (WAUW).

Tables 1 and 2 present the SPSC DSM Working Group's recommended State-Adjusted Load Forecast for each balancing authority in the state/province (Column D), compared to the forecasts that were submitted by the balancing authorities to WECC. The difference between these two sets of load forecasts reflects the difference between the estimated reference case energy efficiency savings (Column B) and the amount of savings already embedded in the WECC load forecast (Column C). The

---

<sup>1</sup> See: "Proposed TEPPC Reference Case DSM Assumptions: Request for Review and Input from SPSC Members," dated April 3, 2010.

remainder of this document provides details on the analysis underlying the values shown in Columns B and C.

Table 1. State-Adjusted Load Forecasts for 2020: Annual Electricity Consumption (GWh)

Balancing Authority (In-State Portion)	A	B	C	D = A - (B - C)	E = (D/A - 1)
	Load Forecast Submitted to WECC	Reference Case Efficiency Savings	Savings Embedded in WECC Load Forecast	State-Adjusted Load Forecast	Percent Change from BA Forecast
	(GWh)	(GWh)	(GWh)	(GWh)	(%)
NWMT	11,484	1,049	0	10,435	-9%
BPA <sup>1</sup>	<del>3,262</del>	355	170	<del>3,077</del>	-6%
WAUW	634	26	0	608	-4%

Deleted: 3,183

Deleted: 2,998

<sup>1</sup> The data in column A was revised to reflect the updated BPA load forecast that WECC provided to LBNL on 07/30/10. The change in the value in Column A resulted in an equivalent change in the value in Column D.

Table 2. State-Adjusted Load Forecasts for 2020: Peak Demand (MW)

Balancing Authority (In-State Portion)	A	B	C	D=A-(B-C)	E = (D/A - 1)
	Load Forecast Submitted to WECC	Reference Case Efficiency Savings	Savings Embedded in WECC Load Forecast	State-Adjusted Load Forecast	Percent Change from BA Forecast
	(MW)	(MW)	(MW)	(MW)	(%)
NWMT	1,866	166	0	1,700	-9%
BPA <sup>1</sup>	<del>585</del>	47	23	<del>561</del>	-4%
WAUW	118	5	0	113	-4%

Deleted: 567

Deleted: 543

<sup>1</sup> The data in column A was revised to reflect the updated BPA load forecast that WECC provided to LBNL on 07/30/10. The change in the value in Column A resulted in an equivalent change in the value in Column D.

## B. Reference Case Energy Efficiency Savings

The reference case energy efficiency savings are associated with: (1) ratepayer-funded energy efficiency programs and (2) new federal appliance and lighting standards. Table 3 summarizes the DSM Working Group's Reference Case projection of the expected energy and peak savings from each of these policy mechanisms. These projections represent the cumulative impact in 2020 from programs and policies implemented over the 2010-2020 time period; that is, they are incremental to impacts from programs or policies implemented prior to 2010.

In the case of BPA, we report only the total reference case energy efficiency savings, and do not differentiate between savings from ratepayer-funded programs and from new federal lighting/appliance standards. The reference case energy efficiency savings for BPA are equal to its pro-rated share of the cumulative 2020 conservation target identified in the Northwest Power and Conservation Council's 6<sup>th</sup> Power Plan. Those targets will be achieved, in part, through ratepayer-funded energy efficiency programs and in part through new federal lighting and appliance standards. Thus, although our analysis does not itemize the contribution from the two policies, we believe that the approach taken for BPA is

largely consistent with the approach taken for the other BAs, in terms of the scope of policy mechanisms covered.<sup>2</sup> It is also important to note that the Council’s conservation targets are measured against a “frozen efficiency” baseline. Thus, the magnitude of the reference case savings for BPA cannot necessarily be directly compared to the savings projections for the other balancing authorities, as those savings targets are likely measured relative to a different baseline definition.

In the remainder of this section, we describe how the values in Table 3 were derived.

Table 3. Reference Case Energy Efficiency Savings in 2020

Balancing Authority (In-State Portion)	Ratepayer-Funded Energy Efficiency		New Federal Lighting/ Appliance Standards		Total	
	GWh	MW	GWh	MW	GWh	MW
NWMT	574	76	475	90	1,049	166
BPA	n/a	n/a	n/a	n/a	355	47
WAUW	0	0	26	5	26	5
<b>State Total</b>	<b>574</b>	<b>76</b>	<b>501</b>	<b>95</b>	<b>1,430</b>	<b>218</b>

Ratepayer-Funded Energy Efficiency Program Savings

Northwestern Energy is the only utility for which the DSM Working Group developed an estimate of expected savings from ratepayer-funded energy efficiency programs (see Table 4). That estimate is based on the planned DSM savings identified in Northwestern’s 2010 Default Electric Supply Procurement Plan.

As mentioned previously, the reference case savings projection for publicly owned utilities within the BPA balancing authority are based on the conservation targets in NPCC’s 6<sup>th</sup> Power Plan, which encompass both ratepayer-funded programs and new federal appliance and lighting standards. For the WAUW balancing authority, the DSM Working Group does not project any savings from ratepayer-funded programs. According to WECC documentation, load within the WAUW is served entirely by the Western Power Administration, which does not administer ratepayer-funded energy efficiency programs.

Table 4. Northwestern Energy Cumulative Savings from Ratepayer-Funded Energy Efficiency Programs

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy Savings (aMW) <sup>1</sup>	5.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Energy Savings (GWh)	48	101	153	206	258	311	364	416	469	521	574
Peak Demand Savings (MW) <sup>2</sup>	6	13	20	27	34	41	48	55	62	69	76

<sup>1</sup> Data Source: Northwestern Energy 2010 Default Electric Supply Procurement Plan. The savings projection identified in the table above is based on the schedule of savings identified in Northwestern’s action plan (6 aMW per year, with a 5.5 aMW ramp-up in the initial year).

<sup>2</sup> It is possible that the NPCC conservation targets may not *fully* capture the savings from the set of new federal lighting and appliance standards included in our analysis. However, at this point in time, it is not possible to quantify the residual savings.

<sup>2</sup> Northwestern’s plan does not provide an estimate of the peak demand savings from planned DSM programs. We therefore estimate the peak demand impacts by applying the peak-to-energy savings ratio implied by the NPCC’s 6<sup>th</sup> Plan Conservation targets for the Pacific Northwest.

### New Federal Lighting and Appliance Standards

In developing its projection of savings from federal lighting and appliance standards, the DSM Working Group focused exclusively on the impact of *new* (or relatively recent) standards<sup>3</sup>, including:

- Standards established directly by Congress through the Energy Independence and Security Act of 2007 (EISA), the most significant of which being the lighting standard;
- Standards established by DOE since 2009 through its normal rulemaking process, or scheduled to be established by January 2013.

The projected state-level energy and peak demand savings from those new standards are summarized in Table 5. These projections derive largely from secondary data sources, as described in the notes section of the table. For some standards, the data sources directly provided state-level savings estimates, based on state-specific demographic and end-use data. For other standards, the data sources provided only national estimates, and the DSM Working Group estimated the state-level impacts, based on the projected savings from standards for similar standards for which both state and national savings estimates were available. Within each state, savings were allocated to individual balancing authorities in proportion to their projected 2020 load.

Table 5. Projected Savings from New Federal Appliance and Lighting Standards in 2020

Balancing Authority (In-State Portion)	EISA <sup>1</sup>		DOE <sup>2</sup>		Total	
	GWh	MW	GWh	MW	GWh	MW
NWMT	219	33	256	57	475	90
BPA	61	9	71	16	132	25
WAUW	12	2	14	3	26	5
<b>State Total</b>	<b>292</b>	<b>44</b>	<b>341</b>	<b>76</b>	<b>633</b>	<b>120</b>

<sup>1</sup> Data Source: Andrew deLaski, executive director of the Appliance Standards Awareness Project (ASAP), provided a spreadsheet with his analysis of the expected savings from each EISA standard. This is an updated version of an analysis previously published jointly by ASAP and ACEEE, and includes only the savings from those standards directly established by EISA. This data source provided only national impacts.

<sup>2</sup> Data Sources: For new standards that DOE has *scheduled* but not yet established, we rely on the savings projections estimated in Neubauer et al. (2009).<sup>4</sup> That report provides estimates of the expected national savings from each individual standard for which DOE expects to complete its rulemaking by January 2013. State-level estimates are not contained within the report, but are published on ASAP’s website, at the following

<sup>3</sup> The DSM Working Group’s decision to focus exclusively on the impact of *new* standards was predicated on the assumption that, in general, the load forecasts submitted by balancing authorities to WECC will already adequately account for the future impact of *existing* standards, by virtue of the econometric load forecasting methods commonly used.

<sup>4</sup> Max Neubauer, Andrew deLaski, Marianne DiMascio & Steven Nadel . 2009. *Ka-BOOM! The Power of Appliance Standards Opportunities for New Federal Appliance and Equipment Standards*. Washigton, DC: American Council for an Energy-Efficient Economy (ACEEE) and the Appliance Standards Awareness Project (ASAP). Report Number ASAP-7/ACEEE-A091.

URL: [http://www.standardsasap.org/state/2009%20federal%20analysis/ka-BOOM\\_overview.html](http://www.standardsasap.org/state/2009%20federal%20analysis/ka-BOOM_overview.html). For new standards that DOE has *already* established, since July 2009, we rely on the DOE technical support documentation associated with the final rule, rather than on the projections in Neubauer et al. (2009).

**C. Energy Efficiency Savings Embedded in the WECC Load Forecasts**

The State-Adjusted Load Forecasts were developed by deducting from the load forecast that each balancing authority submitted to WECC the *incremental* reference case savings not already embedded within that forecast. The incremental reference case savings is equal to the difference between the total reference case savings (as described in the previous section) and the energy savings from the same programs/policies that are already embedded within the load forecast. Table 6 presents the DSM Working Group’s estimates of the energy efficiency program/policy savings already embedded in the balancing authority load forecasts. Further details on the underlying analysis are presented in the remainder of this section.

Table 6. Energy Efficiency Savings Embedded in the WECC Load Forecasts (2020)

Balancing Authority (In-State Portion)	Ratepayer-Funded Energy Efficiency		New Federal Lighting/ Appliance Standards		Total	
	GWh	MW	GWh	MW	GWh	MW
NWMT	0	0	0	0	0	0
BPA	n/a	n/a	n/a	n/a	170	23
WAUW	0	0	0	0	0	0
<b>State Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>170</b>	<b>23</b>

WECC LSE DSM Survey

Members of the SPSC DSM Working Group and the TEPPC DSM Task Force developed a survey instrument to collect information from load serving entities (LSEs) regarding the energy efficiency and DSM assumptions incorporated into the load forecasts provided to WECC. WECC distributed this survey to LSEs on June 8<sup>th</sup>, requesting that they complete the survey by June 30<sup>th</sup>. To date, the DSM Working Group has received a survey response from BPA, but not from any other Montana LSEs.

NWMT

In lieu of a survey response, we estimated the energy efficiency savings embedded in the NWMT load forecast submitted to WECC by benchmarking it against the load forecast in Northwestern Energy’s 2010 Default Electric Supply Procurement Plan (see Table 7). That plan presents the load forecast for Northwestern’s default service customers as well as for retail choice customers within Northwestern’s service territory. Table 7 presents the load forecast from Northwestern’s plan, both with and without the impact of planned DSM programs, and compares the average annual growth rate implied by those forecasts to the growth rate implied by the NWMT balancing authority forecast. For this comparison, we focus on the growth rate over the years 2013-2020, as the balancing authority load forecast data for years 2010-2012 is confidential.

As shown in Table 7, the balancing authority load forecast has a growth rate (1.1%/yr) that is well-above the load growth in the post-DSM IRP load forecast (0.4%/yr), and is even slightly greater than the growth rate in the pre-DSM IRP load forecast (0.9%/yr). On the basis of this comparison, we conclude that the forecast submitted by NWMT to WECC does not account for the expected impact of planned DSM programs.

Table 7. Comparison of NWMT Balancing Authority Load Forecast to Northwestern IRP Forecast

	Annual Energy (GWh)		
	2013	2020	CAGR
NWMT Forecast Submitted to WECC	10,609	11,484	1.1%
Northwestern IRP Forecast (Default + Retail Choice, <b>post-DSM</b> ) <sup>1</sup>	9,258	9,498	0.4%
<i>Planned conservation</i> <sup>2</sup>	206	574	
Northwestern IRP Forecast (Default + Retail Choice, <b>pre-DSM</b> ) <sup>3</sup>	9,464	10,072	0.9%

<sup>1</sup> Data Source: Northwestern Energy 2010 Default Electric Supply Procurement Plan, Vol. 3, Ch.5, Table 1.

<sup>2</sup> Equal to the values cited in Table 3, above.

<sup>3</sup> Calculated by adding planned conservation savings to the reported post-DSM load forecast.

In addition, Northwestern’s procurement plan does not provide any indication of whether the load forecast therein accounts for the impact of either the EISA lighting/appliance standards or any new DOE lighting/appliance standards. The DSM Working Group established as a default rule that, in the absence of any specific evidence that a balancing authority load forecast accounts for the energy savings from new federal lighting and appliance standards, the load forecast is assumed to not account for those impacts.<sup>5</sup> Thus, it is assumed that the NWMT balancing authority load forecast does not account for the impact of either future ratepayer-funded energy efficiency programs or new federal lighting and appliance standards.

#### BPA

BPA completed the WECC DSM survey, and key BPA staff (Ottie Nabors) were also in direct communication with members of the DSM Working Group. Through these communications, BPA indicated that, in virtue of the econometric methods that BPA uses, the load forecast submitted to WECC implicitly assumes a continued rate of conservation acquisition approximately equal to BPA’s share of the conservation target level in the Council’s 5<sup>th</sup> Power Plan. Thus, the incremental reference case energy efficiency savings for BPA is equal to the difference between the conservation target levels

<sup>5</sup> Load forecasts that are developed through econometric methods and calibrated to historical data may implicitly assume that savings from federal lighting appliance standards will continue to accrue at the same rate as in the past. The analysis in Neubauer et al. (2009) suggests that existing federal standards generated savings at a rate of 0.5% of U.S. retail sales per year over the 2000-2010 period, and will continue to generate additional savings at the same rate over the 2010-2020 period. Thus, the savings from new federal standards represent an increase in the rate at which federal standards will accrue energy savings, and this effect is unlikely to be captured by load forecasts that do not explicitly model the savings from these new standards.

in the 6<sup>th</sup> Plan and the 5<sup>th</sup> Plan. This data is presented in Table 8, and allocated to each state in BPA's footprint based on the portion of BPA's BA load occurring within that state.

Table 8. Conservation Savings Embedded in BPA Forecast

State	% of BPA BA Load <sup>1</sup>	Embedded in BPA Load Forecast (5 <sup>th</sup> Plan Target) <sup>2</sup>		Total (6 <sup>th</sup> Plan Target) <sup>2</sup>	
		GWh	MW	GWh	MW
WA	60%	1,815	241	3,779	501
OR	30%	904	120	1,881	250
ID	4%	132	18	276	37
MT	6%	170	23	355	47
<b>BPA Total</b>		<b>3,022</b>	<b>401</b>	<b>6,290</b>	<b>834</b>

<sup>1</sup> Source: Based on analysis provided by NPCC staff (Massoud Jourabchi).

<sup>2</sup> Source: Ottie Nabors (BPA) provided the totals for the entire BPA BA footprint

WAUW

As discussed previously, the DSM Working Group does not include any savings from ratepayer-funded energy efficiency programs within WAUW; thus it was unnecessary to estimate whether savings from such programs are already embedded in the balancing authority forecast. No information was available to indicate whether the load forecast accounts for expected savings from new federal appliance and lighting standards. Thus, the DSM Working Group applied its default rule and assumed that savings from new standards are not embedded within the WAUW load forecast supplied to WECC.