

# **Energy Efficiency Adjustments for the WECC Common Case Load Forecasts**

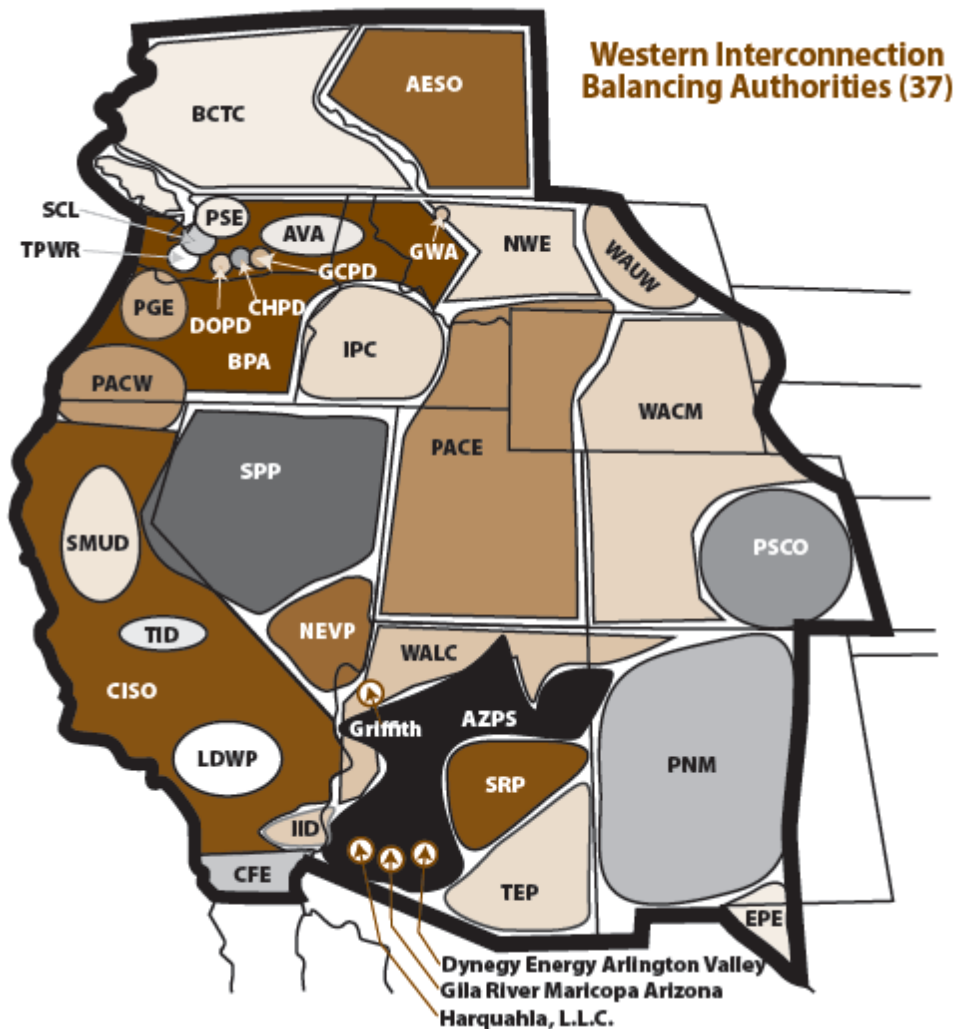
## **LBNL Analysis for Review by SPSC DSM Work Group and TEPPC Participants**

### **1. Introduction**

The 10-year WECC Common Case load forecasts are developed by starting with the load forecasts that the balancing authorities submitted to WECC in early 2011, as part of WECC's 2011 loads and resources data request. LBNL determined, with input from balancing authority (BA) staff and DSM Work Group participants, the extent to which the original load forecasts fully capture the expected impact of current energy efficiency programs implemented over the forecast period. To the extent that the forecasts do not capture the expected impact, they were then adjusted downward accordingly.

The purpose of this document is to solicit feedback on the methodology and assumptions that LBNL used to perform these adjustments. Section 2 provides a general overview of the methodology, as has been provided previously on DSM Work Group calls. Section 3 then summarizes the adjustments made (if any) to each individual balancing authority (BA) forecast and the rationale. Section 4 contains several summary figures that compare the expected energy efficiency savings, adjustments, and adjusted forecasts across all BAs.

We ask DSM Work Group participants to review, at a minimum, the information contained in Section 3 regarding the adjustments made to each BA load forecast. Please refer to the map below (Figure 1) to identify the BAs relevant to your state, province, or region of interest. Those BAs are discussed in alphabetical order in Section 3. For additional technical details not contained within this document, please refer to the accompanying Excel file, "BA Adjustments for WECC Common Case.xlsx," which contains all data, assumptions, and calculations used to perform the energy efficiency adjustments.



**Figure 1. Map of Balancing Authorities within WECC**

## 2. General Description of Energy Efficiency Adjustment Methodology

The purpose of the energy efficiency adjustments is to ensure that the load forecast used for the WECC Common Case fully account (to the extent feasible) for the expected impact of current energy efficiency policies and program plans. In developing these adjustments, two classes of energy efficiency policies are of primary interest: (1) customer-funded energy efficiency programs and (2) federal appliance, lighting, and equipment standards.

### Customer-Funded Energy Efficiency Programs

LBNL estimated the *expected* savings from customer-funded programs based on relevant state or regulatory policies (e.g., statutory energy efficiency resource standards), recent utility integrated resource plans, and utility DSM program plans. DSM Work Group participants were given an opportunity to review and provide written comments on these assumptions, and this input was incorporated into LBNL's subsequent analysis.

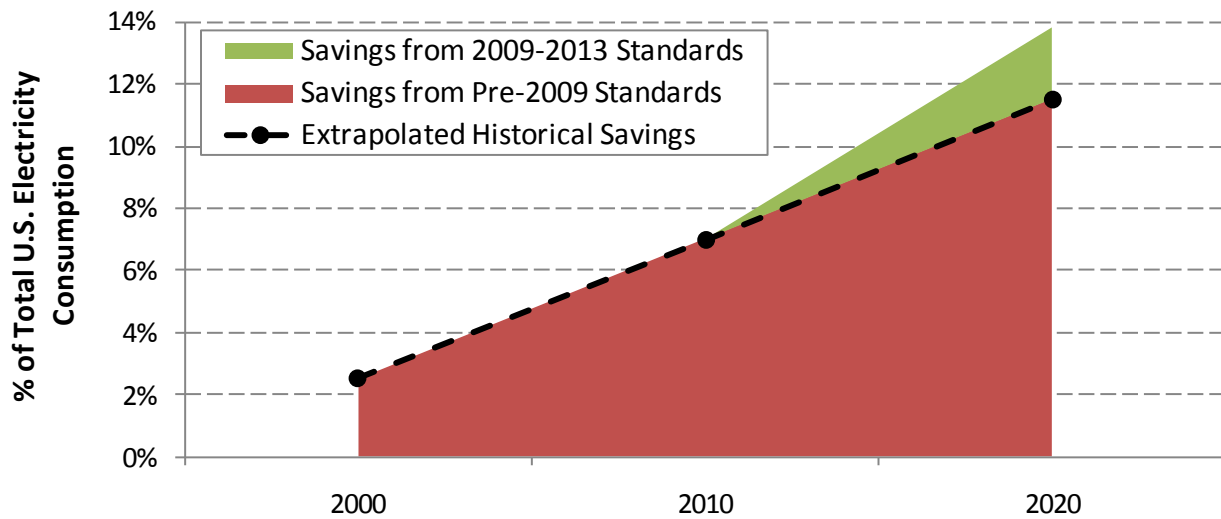
LBNL then determined the extent to which the expected savings from customer-funded was already captured within the original load forecasts submitted by the balancing authorities. This process was aided by the energy efficiency program savings forecasts that the balancing authorities provided to WECC as part of their loads and resources data submittals. LBNL communicated with individual balancing authorities in order to clarify any ambiguities in their savings projections and to confirm whether the load forecasts submitted to WECC fully account for their projected energy efficiency program savings. If the savings projection provided by the BA differed significantly from the expected amount (e.g., if the BA’s savings projection was inconsistent with the most-recent IRP or with statutory savings requirements), or if the load forecast did not fully account for the BA’s savings projection, then the load forecast was adjusted downward accordingly.

Federal Appliance, Lighting, and Equipment Standards

Figure 2 shows the projected cumulative savings over time from federal appliance, lighting, and equipment standards (henceforth referred to simply as “federal standards”). The projected savings are separated into two components:

- The savings from standards established prior to 2009 (some of which don’t go into effect until some number of years afterwards, such as the EISA lighting standard, which is phased in starting in 2012)
- The savings from standards adopted over the 2009-2013 timeframe, which includes a number of updates that have not yet occurred but for which DOE has committed to updating by January 2013.

As indicated in the figure, the cumulative savings from standards established prior to 2009 continues to grow over the 2010-2020 period at the same rate as over the 2000-2010. Thus, those updates that have been adopted, or are scheduled for adoption, during the 2009-2013 period represent an *acceleration* in the rate of savings from federal standards.



Source: Derived from estimates reported in ACEEE/ASAP report, “KaBOOM: The Power of Appliance Standards Opportunities for New Federal Appliance and Equipment Standards” (July 2009).

**Figure 2. Projected Cumulative Savings from Federal Standards**

In light of the projection provided in Figure 2, LBNL developed two standardized (and simplified) methods for estimating the embedded and expected savings from federal standards for individual BAs. Different approaches were taken for some individual BAs, as described within the BA-specific discussions in Section 3.

Method 1. LBNL sought information from individual balancing authorities regarding the manner in which their load forecasts model the impact of standards. Many BAs indicated that their load forecasts do not explicitly model the impact of federal standards. The default assumption in these cases is that, by virtue of the underlying econometric models, these load forecasts implicitly extrapolate into the future the historical rate of savings from federal standards, and that they therefore fully capture the savings from pre-2009 federal standards, but do not capture any of the expected savings from 2009-2013 standards. These load forecasts were therefore adjusted downward based on the expected impact of 2009-2013 standards. For each BA, the expected savings from 2009-2013 standards was estimated from the state-level projections presented in Table 1, by pro-rating the state-level savings based on the portion of the statewide load within the BA.

Method 2. In other instances, BAs reported that their load forecasts were based on end-use models or statistical adjustments that are able to capture the impact of specified federal standards. In practice, these load forecasts capture the impact of all *current* federal standards (as of the date that the forecast was prepared), but do not model the impact of *scheduled* updates to federal standards. In these cases, the load forecasts were assumed to capture the impact of both the pre-2009 standards as well as those standards that have been adopted since 2009 (i.e., a portion of the olive-colored “slice” in Figure 2). These load forecasts were therefore adjusted downward based on the expected impact of only those prospective standards that have not yet been adopted but for which DOE has scheduled an update by January 2013. For each BA, the expected savings from prospective standards scheduled for adoption by January 2013 was estimated from the state-level projections presented in Table 1, by pro-rating the state-level savings based on the portion of the statewide load within the BA.

**Table 1. Expected Cumulative Savings in 2021 from Federal Standards Adopted during 2009-2013**

State	Energy Savings (GWh)			Peak Demand Savings (MW)		
	Already Adopted (post-2009)	Prospective (through Jan. 2013)	<b>Total</b>	Already Adopted (post-2009)	Prospective (through Jan. 2013)	<b>Total</b>
AZ	967	1,395	<b>2,362</b>	304	475	<b>778</b>
CA	4,377	6,183	<b>10,560</b>	966	1,472	<b>2,438</b>
CO	688	1,051	<b>1,739</b>	126	191	<b>317</b>
ID	206	314	<b>520</b>	40	60	<b>100</b>
MT	141	221	<b>362</b>	26	39	<b>65</b>
NV	365	592	<b>956</b>	104	159	<b>263</b>
NM	286	421	<b>707</b>	62	95	<b>158</b>
OR	515	764	<b>1,279</b>	94	143	<b>237</b>
UT	305	466	<b>771</b>	63	96	<b>159</b>
WA	878	1,315	<b>2,193</b>	158	242	<b>400</b>
WY	79	129	<b>208</b>	14	24	<b>38</b>
<b>TOTAL</b>	8,806	12,851	<b>21,657</b>	1,956	2,998	<b>4,954</b>

Sources: DOE Technical Support Documentation accompanying adopted standards (for standards adopted since January 2009); ACEEE/ASAP "KaBOOM: The Power of Appliance Standards Opportunities for New Federal Appliance and Equipment Standards" (for prospective standards with final rules scheduled by January 2013).

### 3. Energy Efficiency Adjustments and WECC Common Case Load Forecasts for Individual Balancing Authorities

This section summarizes, for each individual balancing authority, the embedded and expected savings from energy efficiency policies and programs implemented over the 2011-2021 forecast period, along with the associated adjustments applied to the original WECC load forecasts and the resulting WECC Common Case load forecast. The individual balancing authorities are discussed in alphabetical order.

#### AESO

Based on guidance from provincial representatives for last year's study, it was determined that savings currently being achieved through customer-funded energy efficiency programs are relatively negligible and that there were no policies in place that would require a significant ramp-up in program activity. It was therefore assumed that savings from customer-funded programs would accumulate at a rate of 0.1% of retail sales per year, and that this level of savings was fully captured (albeit implicitly) by the original load forecast. This is the generic assumption used by the DSM Work Group throughout its analysis, for utilities with little or no history of administering significant energy efficiency program portfolios, and where no specific data were available regarding planned energy efficiency program activity.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	111,207	15,437
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,112	154
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	1,112	154
E	<i>Expected Savings: Customer-Funded EE Programs</i>	1,112	154
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	1,112	154
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	0	0
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	111,207	15,437

### AVA

Customer-Funded EE Programs: Avista staff indicated that the AVA load forecast submitted to WECC is net of only the expected impact of pre-existing programs, but does not account for the incremental impact of planned new programs or planned revisions to existing programs, as projected in the 2011 IRP (which is in the final stages of completion). LBNL is awaiting further information from Avista regarding the amount of savings associated with existing programs and with new planned programs in the 2011 IRP. Once those numbers are provided, the load forecast will be adjusted downward to reflect the incremental impact of the planned new programs in 2011 IRP. In the interim, both the embedded and expected savings are equal to savings projection from the 2009 IRP. Savings from NEEA regional market transformation programs implemented over the forecast period are assumed to be captured in the load forecast, under the presumption that NEEA program savings will continue to accumulate at more-or-less their historical rate; therefore, the embedded and expected savings projections for customer-funded energy efficiency programs include the projected savings from NEEA programs, in addition to the IRP savings projections (which exclude NEEA program savings).

Federal Standards: The expected savings from federal standards adopted over the 2009-2013 timeframe was estimated by pro-rating the statewide savings, for each state in which AVA overlaps, in proportion to the portion of statewide load within the balancing authority. Avista staff confirmed that the AVA load forecast submitted to WECC does account for all historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 were therefore assumed to be embedded within the load forecast, and the load forecast was adjusted based on the standard “Method 2” adjustment described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	14,939	2,738
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,930	186
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	118	22
D = B + C	Total Embedded Savings	2,048	208
E	<i>Expected Savings: Customer-Funded EE Programs</i>	1,930	186
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	295	55
G = E + F	Total Expected Savings	2,225	241
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-177	-33
J = H + I	Total Adjustment	-177	-33
K = A + J	WECC Common Case	14,762	2,705

### AZPS

Customer-Funded EE Programs: APS staff confirmed that the load forecast submitted to WECC is net of planned savings from customer-funded energy efficiency programs implemented over the 2011-2021 period, and that the level of savings assumed would meet or exceed the amount required to comply with Arizona's Energy Efficiency Rule. Therefore, no adjustment was made for customer-funded energy efficiency program savings.

Federal Standards: APS staff also indicated that the load forecast does explicitly model federal standards for residential refrigeration and A/C, but not other end-uses (lighting) or customer segments (commercial or industrial), and that only existing standards are modeled. It is therefore unlikely that the load forecast submitted to WECC in March 2011 captures the impact of federal standards adopted over the 2009-2013 period, and therefore the standardized “Method 1” adjustment was made to the load forecast in order to capture the impact of those standards, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	45,394	9,976
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	5,940	855
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	5,940	855
E	<i>Expected Savings: Customer-Funded EE Programs</i>	5,940	855
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	1,045	345
G = E + F	Total Expected Savings	6,985	1,200
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-1,045	-345
J = H + I	Total Adjustment	-1,045	-345
K = A + J	WECC Common Case	44,349	9,631

## BPA

BPA Staff confirmed that the load forecast submitted to WECC this year is net of the balancing authority's pro-rated share of the 6th plan conservation targets (in contrast to last year's forecast, which accounted for conservation savings only at the historical rate). Therefore, no adjustment to the BPA forecast is required for the WECC Common Case. Note that the 6th plan conservation targets are not specific to any individual policy mechanism, and therefore the projections of embedded and expected savings in the table below are not disaggregated into customer-funded EE programs and federal standards. It is also assumed that savings from regional NEEA market transformation programs are included within the Council's conservation targets.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	53,449	10,376
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	6,504	880
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	6,504	880
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	53,449	10,376

## BCTC

**BC Hydro Retail Load:** BC Hydro provided to WECC a projection of the total expected savings from customer-funded energy efficiency programs and from codes/standards. LBNL is currently awaiting confirmation from BC Hydro that this savings amount has already been netted off of the load forecast submitted to WECC, and on what basis the savings projections were derived. In the interim, the savings projection provided to WECC is assumed to be fully captured in the load forecast and is assumed to represent the level of savings expected based on current policies and program plans (as was the case in last year's BC Hydro load forecast). Note that the savings projection provided to WECC aggregates the impact of customer-funded programs and provincial codes/standards; therefore the table below reports only the combined amount. Note also that the savings projection provided WECC represents savings at the customer-meter; these values were therefore grossed up to the bus-bar by adding an assumed 7% T&D losses.

**FortisBC Retail Load:** The BCTC balancing authority also includes the retail load of FortisBC. The expected savings from FortisBC customer-funded EE programs is based on the DSM savings projection in the utility's 2012 Long-Term Demand Side Management Plan. Pending further information from BC Hydro, it is assumed that the balancing authority load forecast

submitted to WECC fully captures the expected impact of FortisBC's programs.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	66,892	12,077
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	11,076	2,000
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	11,076	2,000
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	66,892	12,077

### CHPD

CHPD Staff confirmed that the load forecast submitted to WECC is "net" of planned energy efficiency savings and that the savings projection that Chelan provided to WECC represents the planned energy efficiency savings levels netted off the forecast. Those savings levels are based on a pro-rata share of the regional conservation goals found in the Council's 5th Power Plan, which Chelan used for its latest I937 conservation goals. Thus, no adjustments were made to the load forecast submitted to WECC. Note that the Council's conservation targets are not specific to any individual policy mechanism; therefore, the projections of embedded and expected savings in the table below are not disaggregated into customer-funded EE programs and federal standards. It is also assumed that savings from regional NEEA market transformation programs are included within the Council's conservation targets.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	4,043	717
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	135	26
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	135	26
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	4,043	717

## CISO

The CISO load forecast submitted to WECC was prepared by the CEC and is a modified version of the CEC's December 2009 Demand Forecast (the 2009 IEPR forecast). That forecast accounts only for "committed" energy efficiency savings, and therefore excludes "uncommitted" savings associated with IOU programs implemented after 2012, savings from POU programs implemented after 2010, and savings from other future changes to codes/standards. The forecast was therefore adjusted downward based on the sum of: (a) the uncommitted savings projection developed by the CPUC for the IOUs' long-term procurement proceeding and (b) the estimated cumulative savings from municipal utility customer-funded EE programs within the CISO footprint, based on those utilities' most recent long-term EE savings targets. Note that the committed and uncommitted savings estimates developed by the CEC span a somewhat broader set of policies than just customer-funded programs and federal standards; therefore only total embedded and expected savings projections are shown in the table below, rather than as separate projections for customer-funded programs and federal standards. Note also that further discussions with CEC staff may result in changes to the assumed level of "committed" savings; however, any changes to that assumption will affect the embedded and expected savings projections by an equal amount, and therefore will not result in any change to the proposed WECC Common Case load forecast.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	267,850	56,276
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	2,242	884
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	20,236	7,836
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	-17,994	-6,952
K = A + J	WECC Common Case	249,856	49,324

## DOPD

The expected savings are equal to DOPD's pro-rated share of the Council's 6th plan targets. Pending confirmation from DOPD staff, it is assumed that the load forecast submitted to WECC is already "net" of this level of savings. Note that the Council's conservation targets are not specific to any individual policy mechanism; therefore, the projections of embedded and expected savings in the table below are not disaggregated into customer-funded EE programs and federal standards. It is also assumed that savings from regional NEEA market transformation programs are included within the Council's conservation targets.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	1,931	415
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	117	47
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	117	47
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	1,931	415

### EPE

Customer-Funded EE Programs: EPE staff confirmed that the load forecast submitted to WECC is net of energy efficiency and DG requirements, and that energy efficiency savings projection provided to WECC is based on compliance with New Mexico's and Texas' energy efficiency resource standards. Therefore, no adjustment was made for customer-funded energy efficiency program savings.

Federal Standards: EPE staff also confirmed that the load forecast submitted to WECC does not model any changes to federal lighting/appliance/equipment standards. Therefore the standardized “Method 1” adjustment was made to the load forecast in order to capture the impact of those standards, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	11,031	2,270
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	561	124
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	561	124
E	<i>Expected Savings: Customer-Funded EE Programs</i>	561	124
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	354	79
G = E + F	Total Expected Savings	914	203
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-354	-79
J = H + I	Total Adjustment	-354	-79
K = A + J	WECC Common Case	10,678	2,191

## IID

Customer-Funded Energy Efficiency Programs: Like all California municipal utilities, IID is required to establish 10-year savings targets for customer-funded EE programs. The most recent set of targets were reported to the CEC in a March 2011 compliance filing. IID staff confirmed that the load forecast submitted to WECC does not explicitly consider the impact of customer-funded energy efficiency programs, although it does implicitly assume a continuation of savings at historical levels. Insufficient data is available to assess IID's historical savings or how that level of savings compares to its current long-term goals; therefore, for simplicity, the load forecast is assumed to fully capture IID's long term savings goals.

Federal Standards: IID staff confirmed that the load forecast submitted to WECC does not explicitly consider the impact of federal standards. Therefore the standardized "Method 1" adjustment was made to the load forecast in order to capture the impact of those standards, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	4,405	1,209
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	269	60
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	269	60
E	<i>Expected Savings: Customer-Funded EE Programs</i>	269	60
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	142	33
G = E + F	Total Expected Savings	411	92
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-142	-33
J = H + I	Total Adjustment	-142	-33
K = A + J	WECC Common Case	4,263	1,176

## IPC

Customer-Funded EE Programs: IPC staff confirmed that the load forecast submitted to WECC is net of *only* the existing, committed programs in the 2011 IRP, but that it does not account for the savings from the new planned programs identified in the IRP. Therefore, the IPC load forecast provided to WECC in 2011 is adjusted downward based on the projected savings from new programs identified in Idaho Power's 2011 IRP. Savings from NEEA regional market transformation programs implemented over the forecast period are assumed to be captured in the load forecast, under the presumption that NEEA program savings will continue to accumulate at more-or-less their historical rate; therefore, the embedded and expected savings projections for customer-funded energy efficiency programs include the projected savings from NEEA programs, in addition to the IRP savings projections (which exclude NEEA program savings).

Federal Standards: Idaho Power staff indicated that the company's current load forecasting model does include statistical end-use adjustments for residential load, and therefore captures all historical changes to federal standards for residential end-uses (and the company is planning to use the same model for commercial customers in future load forecasts). The bulk of the expected savings from those federal standards that have been adopted since 2009 is associated with commercial end-uses (the fluorescent lighting standard in particular). Therefore, it is assumed that the IPC load forecast does not account for the savings from federal standards adopted since 2009, nor for any of the prospective standards that are scheduled for adoption by January 2013, and the standardized "Method 1" adjustment was made to the load forecast in order to capture the impact of those standards, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	19,946	4,853
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,455	236
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	1,455	236
E	<i>Expected Savings: Customer-Funded EE Programs</i>	1,690	274
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	334	64
G = E + F	Total Expected Savings	2,025	338
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	-235	-38
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	-334	-64
J = H + I	Total Adjustment	-569	-102
K = A + J	WECC Common Case	19,377	4,751

### GCPD

The expected savings are equal to GCPD's pro-rated share of the Council's 6th plan targets. Pending confirmation from GCPD staff, it is assumed that the load forecast submitted to WECC is already "net" of this level of savings. Note that the Council's conservation targets are not specific to any individual policy mechanism; therefore, the projections of embedded and expected savings in the table below are not disaggregated into customer-funded EE programs and federal standards. It is also assumed that savings from regional NEEA market transformation programs are included within the Council's conservation targets.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	5,103	846
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	314	127
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	314	127
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	5,103	846

### LDWP

Customer-Funded EE Programs: The LADWP balancing authority consists of three utilities (LADWP, Burbank, and Glendale), each of which is required to establish 10-year energy efficiency savings targets. LADWP staff confirmed that the load forecast submitted to WECC is "net" of savings from planned customer-funded energy efficiency programs, based on each utility's most recently approved set of targets. (Note, though, that the current targets for LADWP terminate in 2016, and thus the utility used the 2010 IRP savings projections for years thereafter, which taper off significantly after 2016). Given that the utilities' savings targets are fully captured by the load forecast submitted to WECC, no adjustments were made for customer-funded energy efficiency programs.

Federal Standards: LADWP staff indicated that the load forecast submitted to WECC does contain an adjustment to account for the impact of the Huffman lighting standards, but not for any future standards. The forecast therefore likely captures some or all of the savings associated with the lighting standard update adopted by DOE in 2009. For simplicity, we assume that savings associated with all federal standards already adopted since January 2009 are embedded within the load forecast (as the lighting standard represents the bulk of the total expected savings from federal standards updates since January 2009), and apply the standard "Method 2" adjustment described in Section 2 in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	32,585	8,186
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	2,519	515
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	436	96
D = B + C	Total Embedded Savings	2,954	611
E	<i>Expected Savings: Customer-Funded EE Programs</i>	2,519	515
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	1,051	243
G = E + F	Total Expected Savings	3,570	758
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-615	-147
J = H + I	Total Adjustment	-615	-147
K = A + J	WECC Common Case	31,969	8,039

### NEVP

Customer-Funded EE Programs: NV Energy staff confirmed that the NEVP load forecast submitted to WECC is net of planned energy efficiency savings, and that the savings projection provided to WECC represents the amount of savings assumed in developing the forecast. The DSM Work Group initially specified that the expected savings should be based on the assumption that the savings levels specified within Nevada Power's 2011-2013 DSM plan continue over the entirety of the 2011-2021 forecast period. In contrast, the savings projection assumed by NV Energy in constructing their load forecast is equal to roughly half of what would occur under the DSM Work Group's initial projection of expected savings. NV Energy staff indicated that their savings projections accounts for measure decay, which may partially explain the difference between the savings assumption used in developing their load forecast and the DSM Work Group's initial projection (which does not account for measure decay). LBNL staff is awaiting further information from NV Energy regarding their assumption about the rate at which new savings is acquired over the 2011-2021 period, prior to accounting for measure decay. If those assumptions are consistent with the expected rate at which new savings are acquired under the DSM Work Group's projection, no adjustment to the forecast will be made to the load forecast for customer-funded EE programs. In the interim, the NEVP load forecast is adjusted downward based on the difference between the DSM Work Group's initial projection of expected savings and the savings level assumed by NV Energy in constructing their load forecast.

Federal Standards: The expected savings from federal standards adopted over the 2009-2013 timeframe was estimated by pro-rating the statewide savings, in proportion to the portion of statewide load within the balancing authority. NV Energy staff confirmed that the NEVP load forecast does account for historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 were therefore assumed to be embedded within the load forecast, and the standard "Method 2" adjustment described in Section 2 was applied in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	27,066	6,767
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,011	223
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	247	70
D = B + C	Total Embedded Savings	1,258	294
E	<i>Expected Savings: Customer-Funded EE Programs</i>	2,076	459
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	648	178
G = E + F	Total Expected Savings	2,724	637
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-1,065	-235
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-401	-108
J = H + I	Total Adjustment	-1,466	-343
K = A + J	WECC Common Case	25,600	6,423

### NWMT

Customer-Funded EE Programs: The expected savings is based on the savings projection in NorthWestern's 2010 Electric Default Supply Procurement Plan. NorthWestern Energy staff has not yet confirmed whether the load forecast submitted to WECC is net of planned energy efficiency program savings, and if so, how much savings was planned when constructing the forecast. The DSM Work Group analysis in 2010 indicated that the NWMT load forecast submitted to WECC last year did not account for the impact of planned energy efficiency program savings. Therefore, pending further information from Northwestern Energy, the NWMT load forecast provided to WECC in 2011 is similarly assumed to not account for impact of any customer-funded programs implemented over the forecast period, and the load forecast is therefore adjusted downward based on the savings projection in Northwestern's 2010 Default Supply Procurement Plan.

Federal Standards: NorthWestern Energy staff has not yet confirmed whether the load forecast submitted to WECC explicitly considers the impact of federal standards. Pending further information, the standardized “Method 1” adjustment was made to the load forecast in order to capture the impact of those standards, as described in Section 2.

## Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	11,618	1,881
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	0	0
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	0	0
E	<i>Expected Savings: Customer-Funded EE Programs</i>	578	94
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	272	49
G = E + F	Total Expected Savings	851	142
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-578	-94
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-272	-49
J = H + I	Total Adjustment	-851	-142
K = A + J	WECC Common Case	10,767	1,739

### PACE

Customer-Funded EE Programs (PacifiCorp): PacifiCorp staff confirmed that the PACE load forecast submitted to WECC accounted for the planned energy efficiency program savings from the 2008 IRP Update (issued in 2010). The savings targets in the more-recent 2011 IRP (issued March 31, 2011) are somewhat higher than the targets in the 2008 IRP Update. Therefore, to develop the WECC Common Case forecast, the original PACE forecast was decremented by an amount equal to the difference between the savings targets in the 2011 IRP and the 2008 IRP Update.

Customer-Funded EE Programs (Other Utilities in PACE): In addition to PacifiCorp, the PACE balancing authority also includes all of the municipal utilities and cooperatives in Utah, as well as Montana-Dakota Utilities in Wyoming (representing, in aggregate, about 15% of the balancing authority load). The DSM Work Group's projection of expected savings from MDU's programs are based on the most recent 3-year DSM plan, and assume that the average annual incremental savings in that plan continue over the entirety of the 2011-2021 forecast period. The expected savings from Utah municipal utilities and cooperatives are based on the assumption that savings accumulate at a rate of 0.1% of retail sales per year. This is the generic conservative assumption used by the DSM Work Group throughout its analysis for small utilities with little or no history of administering significant energy efficiency program portfolios and/or where no specific data were available regarding planned energy efficiency program activity. No information was provided to WECC or to LBNL regarding the extent to which the load forecast submitted to WECC accounted for expected savings from customer-funded programs by MDU or by the Utah municipal utilities and cooperatives. For simplicity, given the relatively small portion of the overall PACE load represented by these utilities, it was assumed that the original load forecast submitted to WECC fully captures the expected savings from those utilities' programs.

Federal Standards: The expected savings from federal standards adopted over the 2009-2013 timeframe was estimated by pro-rating the statewide savings, for each state in which PACE overlaps, in proportion to the portion of statewide load within the balancing authority.

PacifiCorp staff confirmed that the PACE load forecast does account for all historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 was therefore assumed to be embedded within the load forecast, and the standard “Method 2” adjustment described in Section 2 was applied in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	56,225	11,140
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	2,544	492
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	379	77
D = B + C	Total Embedded Savings	2,923	569
E	<i>Expected Savings: Customer-Funded EE Programs</i>	3,283	616
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	964	195
G = E + F	Total Expected Savings	4,247	811
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-739	-124
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-585	-118
J = H + I	Total Adjustment	-1,323	-242
K = A + J	WECC Common Case	54,902	10,898

### PACW

Customer-Funded EE Programs: PacifiCorp staff confirmed that the PACW load forecast submitted to WECC accounted for the planned energy efficiency program savings from the 2008 IRP Update (issued in 2010). The savings targets in the more-recent 2011 IRP (issued March 31, 2011) are somewhat higher than the targets in the 2008 IRP Update. Therefore, to develop the WECC Common Case forecast, the original PACW forecast was decremented by an amount equal to the difference between the savings targets in the 2011 IRP and the 2008 IRP Update. PacifiCorp staff confirmed that the EE targets for Oregon contained within the 2011 IRP were provided to PacifiCorp by the Oregon Energy Trust, and are intended to reflect all achievable cost-effective efficiency, based on the Trust's current planning assumptions.

Federal Standards: The expected savings from federal standards adopted over the 2009-2013 timeframe was estimated by pro-rating the statewide savings, for each state in which PACW overlaps, in proportion to the portion of statewide load within the balancing authority. PacifiCorp staff confirmed that the PACW load forecast does account for all historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 were therefore assumed to be embedded within the load forecast, and the standard “Method 2” adjustment described in Section 2 was applied in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	23,042	4,287
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,769	297
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	210	39
D = B + C	Total Embedded Savings	1,979	336
E	<i>Expected Savings: Customer-Funded EE Programs</i>	2,061	346
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	522	98
G = E + F	Total Expected Savings	2,583	444
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-292	-49
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-311	-59
J = H + I	Total Adjustment	-603	-108
K = A + J	WECC Common Case	22,439	4,179

### PGE

Customer-Funded EE Programs: PGE staff confirmed that the PGE load forecast is net of the savings from all planned energy efficiency programs, and is based on a savings projection provided to PGE by the Energy Trust. Therefore, no adjustment to the initial forecast was made for customer-funded energy efficiency program savings. The savings projection provided to PGE extends only through 2017, and PGE staff indicated that for the 2018-2021 period, they assumed that savings would continue at the same rate as prior to 2017.

Federal Standards: PGE staff also confirmed that the PGE load forecast does not model any changes to federal lighting/appliance/equipment standards. Therefore, the standardized “Method 1” adjustment was made to the load forecast in order to capture the impact of standards adopted over the 2009-2013 period, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	23,591	4,257
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	3,289	552
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	3,289	552
E	<i>Expected Savings: Customer-Funded EE Programs</i>	3,289	552
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	526	98
G = E + F	Total Expected Savings	3,816	650
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-526	-98
J = H + I	Total Adjustment	-526	-98
K = A + J	WECC Common Case	23,065	4,160

## PNM

Customer-Funded EE Programs (PNM utility): PNM Staff confirmed that the load forecast submitted to WECC does not capture the expected impact of PNM customer-funded energy efficiency programs -- that is, it is a "pre-energy efficiency" forecast. PNM provided WECC with its forecast of planned savings from customer-funded energy efficiency programs, which complies with New Mexico's energy efficiency resource standard. The load forecast that PNM provided to WECC was therefore reduced by an amount equal to PNM's projected energy efficiency savings.

Customer-Funded EE Programs (other utilities in the PNM balancing authority): The PNM balancing authority includes several municipal utilities and a number of cooperatives served by Tri-State G&T; together, these utilities constitute roughly 26% of the total PNM balancing authority load. Information was not readily available regarding the planned energy efficiency savings by these entities or the amount of savings already embedded in the overall balancing authority forecast. Lacking such information, the DSM Work Group assumes that customer-funded energy efficiency programs implemented by these entities will yield annual incremental savings equal to 0.1% of retail sales per year (a relatively modest level, though not atypical for small public utilities), and that this level of savings is captured within the load forecast by virtue of the econometric methods used to develop the forecast.

Federal Standards: PNM staff also confirmed that the PNM load forecast does not model any changes to federal lighting/appliance/equipment standards. Therefore, the standardized "Method 1" adjustment was made to the load forecast in order to capture the impact of standards adopted over the 2009-2013 period, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	18,261	3,166
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	40	6
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	40	6
E	<i>Expected Savings: Customer-Funded EE Programs</i>	833	136
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	585	131
G = E + F	Total Expected Savings	1,419	267
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	-794	-129
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	-585	-131
J = H + I	Total Adjustment	-1,379	-260
K = A + J	WECC Common Case	16,882	2,906

## PSCO

Customer-Funded EE Programs (Xcel): Xcel staff indicated that the load forecast provided to WECC is net of the previous set of long-term savings goals established under Docket. 08-0560.

The forecast was therefore adjusted downward slightly in order to account for the higher level of savings required under the updated goals adopted in March 2011 (Decision No. C11-0442).

Customer-Funded EE Programs (other utilities in PSCO balancing authority): The PSCO balancing authority also includes a number of other utilities, including Black Hills, the municipal utilities served by Platte River (Fort Collins and several smaller utilities), a number of cooperatives served by Tri-State, as well as cooperatives served by the Arkansas River Power Authority and Municipal Energy Agency of Nebraska. According to PSCO staff, those utilities provide their own load forecasts to PSCO, and did not provide any information about whether those forecasts are "net" of planned energy efficiency savings. For simplicity (given the relatively small size of those other utilities compared to PSCO and the time and resources required for independent validation), we assume that the load forecasts for those smaller entities do fully account for the expected impact of their customer-funded energy efficiency programs. For Black Hills, the expected savings is based on the long-term savings targets approved by the commission in Docket No. 08A-518E. For Platte River Power Authority (PRPA), the expected savings is based on the savings projection provided by PRPA to WECC, which is somewhat below the saving level currently being achieved by Fort Collins. For the Tri-State, ARPA, and MEAN cooperatives within the PSCO balancing authority, expected savings are based on a stipulated annual incremental savings of 0.1% of retail sales per year; this is the generic assumption used by the DSM Work Group throughout its analysis, for utilities with little or no history of administering significant energy efficiency program portfolios, and where no specific data were available regarding planned energy efficiency program activity.

Federal Standards: PSCO staff confirmed that the utility's load forecast does account for all historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 were therefore assumed to be embedded within the load forecast, and the standard "Method 2" adjustment described in Section 2 was applied in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

#### **Derivation of WECC Common Case Load Forecast for 2021**

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	43,504	8,503
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	4,409	830
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	467	86
D = B + C	Total Embedded Savings	4,876	916
E	<i>Expected Savings: Customer-Funded EE Programs</i>	5,598	1,054
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	1,181	215
G = E + F	Total Expected Savings	6,779	1,270
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	-1,189	-224
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	-714	-130
J = H + I	Total Adjustment	-1,903	-354
K = A + J	WECC Common Case	41,601	8,149

## PSE

Customer-Funded EE Programs: PSE staff confirmed that the load forecast submitted to WECC is net of planned energy efficiency savings, though they have not yet confirmed whether the amount of savings assumed is consistent with the savings projections in their 2011 IRP. Pending confirmation from PSE, it is assumed that the load forecast provided to WECC fully accounts for the level of savings identified in the utility's 2011 IRP. Therefore, no adjustment to the forecast is currently made for customer-funded EE programs.

Federal Standards: PSE staff confirmed that the load forecast submitted to WECC does not explicitly consider the impact of recent or scheduled updates to federal standards through 2013 (although the utility did explicitly model the impact of the EISA lighting standard established in 2007). Therefore, the standardized "Method 1" adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	26,926	5,410
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	4,081	836
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	4,081	836
E	<i>Expected Savings: Customer-Funded EE Programs</i>	4,081	836
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	586	107
G = E + F	Total Expected Savings	4,667	943
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	-586	-107
J = H + I	Total Adjustment	-586	-107
K = A + J	WECC Common Case	26,340	5,303

## SCL

Customer-Funded EE Programs: The savings projection that SCL provided to WECC is consistent with the conservation targets identified in Seattle City Light's 2010 IRP. Seattle City Light staff has not yet confirmed that the load forecast submitted to WECC is already net of this level of savings. Pending confirmation from the utility, it is assumed that the forecast is net of this expected savings level, and therefore no adjustments were made to the forecast for customer-funded programs.

Federal Standards: Seattle City Light staff have not yet indicated whether the load forecast submitted to WECC explicitly considers the impact of federal standards. Pending confirmation from the utility, the standardized "Method 1" adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

## Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	10,899	1,941
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,021	182
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	1,021	182
E	<i>Expected Savings: Customer-Funded EE Programs</i>	1,021	182
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	237	43
G = E + F	Total Expected Savings	1,258	225
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-237	-43
J = H + I	Total Adjustment	-237	-43
K = A + J	WECC Common Case	10,662	1,898

## SMUD

Customer-Funded EE Programs (SMUD): SMUD staff confirmed that the load forecast submitted to WECC is net of assumed savings from SMUD customer-funded energy efficiency programs over the 2011-2021 period. However, the assumed energy efficiency savings through 2017 are equal to about 70% of the long-term targets established by the SMUD Board (which currently extend only through 2017), and in years after 2017, the assumed savings in SMUD's load forecast are about 40% of the SMUD Board-approved target for 2017. SMUD staff indicated that the assumed savings reflect near-term EE program forecasts through 2014 and the Itron potential study estimates for years after 2014, rather than the SMUD Board-approved goals, because of the uncertainty surrounding both the unmanaged forecast and EE program effectiveness. In deference to the judgment of SMUD's planning team, the SPSC DSM Work Group's projection of expected savings from SMUD customer-funded EE program savings is equal to the level assumed by SMUD when developing their load forecast, and no adjustment to the forecast was made.

Customer-Funded EE Programs (other utilities in the SMUD balancing authority): The SMUD balancing authority includes several other municipal utilities (Modesto, Redding, or Roseville); like all municipal utilities in California, these three utilities are also required to establish long-term savings goals and to report those targets to the CEC. SMUD staff could not confirm whether the forecast also accounted for the expected impacts from planned energy efficiency programs by those utilities. For simplicity, given the relatively small size of those utilities compared to SMUD, it was assumed that the long-term savings targets for those utilities were also fully captured by the balancing authority load forecast.

Federal Standards: SMUD staff also confirmed that the load forecast submitted to WECC does not model any changes to federal lighting/appliance/equipment standards. Therefore, the standardized "Method 1" adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2. SMUD staff, however, did indicate that the company is testing Itron's statistically-adjusted end-

use model for future load forecasting, and this model would allow federal standards to be explicitly modeled in future years.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	18,572	4,496
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,649	262
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	1,649	262
E	<i>Expected Savings: Customer-Funded EE Programs</i>	1,649	262
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	599	138
G = E + F	Total Expected Savings	2,248	400
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-599	-138
J = H + I	Total Adjustment	-599	-138
K = A + J	WECC Common Case	17,973	4,358

### SPP

Customer-Funded EE Programs: NV Energy staff confirmed that the SPP load forecast submitted to WECC is net of planned energy efficiency savings, and that the savings projection provided to WECC represents the amount of savings assumed in developing the forecast. The DSM Work Group initially specified that the expected savings should be based on the assumption that the savings levels specified within Sierra Pacific's 2011-2013 DSM plan continue over the entirety of the 2011-2021 forecast period. In contrast, the savings projection assumed by NV Energy in constructing their load forecast is equal to roughly 75% of what would occur under the DSM Work Group's initial projection of expected savings. NV Energy staff indicated that their savings projections accounts for measure decay, which may partially explain the difference between the savings assumption used in developing their load forecast and the DSM Work Group's initial projection (which does not account for measure decay). LBNL is awaiting further information from NV Energy regarding their assumption about the rate at which new savings is acquired over the 2011-2021 period, prior to accounting for measure decay. If those assumptions are consistent with the expected rate at which new savings are acquired under the DSM Work Group's projection, no adjustment to the forecast will be made to the load forecast for customer-funded EE programs. In the interim, the SPP load forecast is adjusted downward based on the difference between the DSM Work Group's initial projection of expected savings and the savings level assumed by NV Energy in constructing their load forecast.

Federal Standards: The expected savings from federal standards adopted over the 2009-2013 timeframe was estimated by pro-rating the statewide savings, in proportion to the portion of statewide load within the balancing authority. NV Energy staff confirmed that the SPPC load forecast does account for historical changes to federal standards, but does not account for any planned updates. Savings associated with federal standards already adopted since January 2009 were therefore assumed to be embedded within the load forecast, and the standard “Method 2”

adjustment described in Section 2 was applied in order to account for the expected savings from prospective standards scheduled for adoption by January 2013.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	12,887	2,153
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	486	139
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	118	33
D = B + C	Total Embedded Savings	604	173
E	<i>Expected Savings: Customer-Funded EE Programs</i>	637	182
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	308	85
G = E + F	Total Expected Savings	945	267
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-151	-43
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-191	-51
J = H + I	Total Adjustment	-341	-94
K = A + J	WECC Common Case	12,545	2,058

### SRP

Customer-Funded EE Programs: SRP staff confirmed that the load forecast submitted to WECC is net of the planned savings levels as of last summer, which extend only through 2017. The expected savings from customer-funded programs are, instead, based on the recently adopted Sustainable Portfolio Plan target levels. According to SRP staff, the planned savings levels in the forecast are roughly in line with the utility's current expectations for the savings levels needed to meet the Sustainable Portfolio Plan savings targets through 2017 (due, in part, to the recent downward revision to their load forecast, which in turn reduces the amount of savings required to meet the percentage targets under the Sustainable Portfolio Plan). Thus, the load forecast was adjusted only to account for the expected savings needed to meet the Sustainable Portfolio Plan savings targets in the years 2018-2021. In calculating the cumulative embedded and expected savings, it was assumed that 48% of the annual incremental savings from SRP's EE program portfolio is associated with the M-Power program, and that the savings from that program do not persist beyond the first year. The 48% assumption is based on SRP's forecast of EE program savings for FY11.

Federal Standards: SRP staff have not yet confirmed whether the load forecast submitted to WECC explicitly considers the impact of federal standards. Pending further information, the standardized "Method 1" adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	34,597	7,786
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,949	438
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	1,949	438
E	<i>Expected Savings: Customer-Funded EE Programs</i>	3,368	758
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	797	263
G = E + F	Total Expected Savings	4,165	1,021
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-1,419	-319
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-797	-263
J = H + I	Total Adjustment	-2,216	-582
K = A + J	WECC Common Case	32,381	7,204

### TEP

Customer-Funded EE Programs: TEP/UNS staff indicated that the load forecast submitted to WECC partially accounts for the effects of planned customer-funded energy efficiency programs over the forecast period, but not at the level necessary to meet the Arizona Energy Efficiency Standard. The program savings forecast that TEP originally submitted to WECC represents the cumulative savings that required to comply with the Arizona Energy Efficiency Rule, of which only a portion is captured within the load forecast. TEP staff provided a separate table to LBNL identifying the level of savings that was captured by the original forecast. To construct the WECC Common Case forecast, TEP's original load forecast was therefore reduced by an amount equal to the difference between the level of savings required to meet the EE standard (as indicated by TEP) and the amount already incorporated into the forecast.

Federal Standards: TEP staff confirmed that the load forecast submitted to WECC does not model any changes to federal lighting/appliance/equipment standards. Therefore, the standardized “Method 1” adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

## Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	16,319	3,359
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	1,381	215
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	1,381	215
E	<i>Expected Savings: Customer-Funded EE Programs</i>	2,277	354
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	376	124
G = E + F	Total Expected Savings	2,653	478
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-896	-139
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-376	-124
J = H + I	Total Adjustment	-1,272	-263
K = A + J	WECC Common Case	15,046	3,096

### TID

Customer-Funded Energy Efficiency Programs: Like all California municipal utilities, TID is required to establish 10-year savings targets for customer-funded EE programs. The most recent set of targets were reported to the CEC in a March 2011 compliance filing. The SPSC DSM Work Group was unable to confirm with TID staff whether their forecast is net of planned energy efficiency savings, and if so, by how much. Given the lack of information available, the same assumptions were employed for TID as for IID. Namely, the forecast was assumed to fully capture planned energy efficiency savings, based on the utility's most-recent 10-year savings targets.

Federal Standards: The SPSC DSM Work Group was unable to confirm with TID staff whether/how the forecast accounts for savings from federal standards. Given the lack of information available, it was assumed that the forecast does not explicitly model the impact of federal standards; and therefore, the standardized “Method 1” adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	2,924	689
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	185	44
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	185	44
E	<i>Expected Savings: Customer-Funded EE Programs</i>	185	44
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	94	22
G = E + F	Total Expected Savings	279	65
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-94	-22
J = H + I	Total Adjustment	-94	-22
K = A + J	WECC Common Case	2,830	667

### TPWR

Tacoma Power staff provided a load forecasting report indicating that the forecast prepared by the utility is net of planned conservation, and the energy efficiency savings projection provided to WECC is consistent with the utility's pro-rated share of the Council's 6th plan conservation targets. Thus, no adjustments were made to the load forecast submitted to WECC. Note that the Council's conservation targets are not specific to any individual policy mechanism; therefore, the projection of embedded and expected savings in the table below are not disaggregated into customer-funded EE programs and federal standards. It is also assumed that savings from regional NEEA market transformation programs are included within the Council's conservation targets.

### Derivation of WECC Common Case Load Forecast for 2021

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	5,443	1,035
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	n/a	n/a
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	n/a	n/a
D = B + C	Total Embedded Savings	588	9
E	<i>Expected Savings: Customer-Funded EE Programs</i>	n/a	n/a
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	n/a	n/a
G = E + F	Total Expected Savings	588	9
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	n/a	n/a
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	n/a	n/a
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	5,443	1,035

### WACM

Customer-Funded EE Programs: The WACM balancing authority consists of a large number of municipal utilities and cooperatives located in Colorado and Wyoming, the largest of which

being Colorado Springs Utilities, and most others being served by Tri-State or the Municipal Energy Agency of Nebraska. For Colorado Springs, the expected savings from customer-funded EE programs are based on the utility's recently established goal of achieving 10% reduction in per capita energy consumption by 2010. All other utilities in the balancing authority are assumed to achieve savings of 0.1% per year (or 1% cumulatively over the forecast period); this is the generic conservative assumption used by the DSM Work Group for utilities with little or no history of administering significant energy efficiency program portfolios, and where no specific data were available regarding planned energy efficiency program activity. Western Area Power Administration (WAPA) prepares the load forecast for the region, and WAPA staff indicated that the forecast was developed by extrapolating prior years' load, without explicitly accounting for the impacts of energy efficiency programs. It was therefore assumed that the load forecast only partially captured the expected savings from Colorado Springs' programs, with the embedded savings equal to to the EE targets in the utility's 2008 IRP (which are below the more-recent targets and are assumed to be consistent with historical achievements). All other utilities' EE program savings were assumed to be fully captured within the load forecast, by virtue of the fact that no significant increase in program savings from those utilities is expected.

Federal Standards: Given the manner in which the load forecast was constructed, it was assumed that the forecast does not capture the expected impact of federal standards adopted over the 2009-2013 timeframe. Therefore, the standardized “Method 1” adjustment was made to the load forecast in order to capture the expected impact of standards adopted over the 2009-2013 period, as described in Section 2.

#### **Derivation of WECC Common Case Load Forecast for 2021**

		<b>GWh</b>	<b>MW</b>
A	Forecast submitted to WECC	30,644	4,764
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	375	71
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	0	0
D = B + C	Total Embedded Savings	375	71
E	<i>Expected Savings: Customer-Funded EE Programs</i>	924	174
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	646	118
G = E + F	Total Expected Savings	1,569	292
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	-549	-103
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	-646	-118
J = H + I	Total Adjustment	-1,195	-221
K = A + J	WECC Common Case	29,449	4,543

#### **WALC**

The WALC balancing authority consists of a large number of municipal utilities and cooperatives located in Arizona and New Mexico. The expected savings from customer-funded EE programs was estimated based on an assumed annual incremental savings of 0.1% of load per year; this is the generic conservative assumption used by the DSM Work Group for utilities with little or no history of administering significant energy efficiency program portfolios, and where no specific data were readily available regarding planned energy efficiency program activity.

The expected savings from 2009-2013 federal standards over the forecast period was estimated based on the standard method of pro-rating expected statewide savings based on the proportion of 2021 statewide load within the balancing authority, for each of the states with which WALC overlaps. Western Area Power Administration (WAPA) prepares the load forecast for the region, and WAPA staff indicated that the WALC load forecast submitted to WECC was constructed simply by applying a stipulated 1% growth rate to the previous year's actual peak load, as a 1% load growth is the minimum required by WECC's L&R program that avoids triggering a load growth alarm. Given the simplified method of developing the load forecast, it is practically infeasible to specify the degree to which the forecast accounts for the expected savings from current energy efficiency policies and program plans, and therefore no adjustment was made to the forecast originally submitted to WECC.

### Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	7,549	1,585
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	83	17
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	186	57
D = B + C	Total Embedded Savings	269	74
E	<i>Expected Savings: Customer-Funded EE Programs</i>	83	17
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	186	57
G = E + F	Total Expected Savings	269	74
H = B - E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C - F	<i>Adjustment: 2009-2013 Federal Standards</i>	0	0
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	7,549	1,585

### WAUW

The WAUW balancing authority consists of a relatively small amount of load in eastern Montana. The expected savings from customer-funded EE programs was estimated based on an assumed annual incremental savings of 0.1% of load per year; this is the generic conservative assumption used by the DSM Work Group for utilities with little or no history of administering significant energy efficiency program portfolios, and where no specific data were readily available regarding planned energy efficiency program activity. The expected savings from 2009-2013 federal standards over the forecast period was estimated based on the standard method of pro-rating expected statewide savings based on the proportion of 2021 statewide load within the balancing authority. Western Area Power Administration (WAPA) prepares the load forecast for the region, but did not provide any information regarding the degree to which the load forecast captures the expected savings from customer-funded EE programs or federal standards. Given the lack of information available, and given the arguably negligible size of the WAUW load, no adjustment was made to the original load forecast submitted to WECC.

## Derivation of WECC Common Case Load Forecast for 2021

		GWh	MW
A	Forecast submitted to WECC	821	147
B	<i>Embedded Savings: Customer-Funded EE Programs</i>	9	2
C	<i>Embedded Savings: 2009-2013 Federal Standards</i>	19	3
D = B + C	Total Embedded Savings	28	5
E	<i>Expected Savings: Customer-Funded EE Programs</i>	9	2
F	<i>Expected Savings: 2009-2013 Federal Standards</i>	19	3
G = E + F	Total Expected Savings	28	5
H = B – E	<i>Adjustment: Customer-Funded EE Programs</i>	0	0
I = C – F	<i>Adjustment: 2009-2013 Federal Standards</i>	0	0
J = H + I	Total Adjustment	0	0
K = A + J	WECC Common Case	821	147

### 4. Comparisons of Expected Savings, Adjustments, and Common Case Load Forecasts Across Balancing Authorities

This section compares the results described in Section 3 across balancing authorities. Figure 3 shows the *expected* cumulative savings in 2021 for each balancing authority associated with customer-funded programs implemented over the forecast period and federal standards adopted over the 2009-2013 period, expressed as a percentage of 2021 load. (Note that for some balancing authorities, only the combined savings from these policy mechanisms is reported, for reasons explained in Section 3.) As shown, expected savings vary considerably across balancing authorities, largely reflecting differences in the effect of customer-funded EE programs. On a WECC-wide basis, the expected cumulative savings in 2021 is equal to 8.9% of 2021 load.

Figure 4 shows the energy efficiency adjustments to each balancing authority load forecast, expressed as a percentage reduction in the original balancing authority load forecast for 2021. Nine balancing authority load forecasts received no adjustment; i.e., the WECC Common Case load forecast for those BAs is simply equal to the original forecast submitted to WECC. The remaining balancing authority load forecasts were all adjusted downward to account for the expected acceleration in savings from federal standards, with the magnitude of this individual adjustment ranging from 1-3%, depending on whether the “Method 1” or “Method 2” adjustments were applied, as described in Section 2. The total downward adjustment was greater for the 12 balancing authorities whose original load forecast did not fully capture the expected impact of customer-funded EE programs. In aggregate, the WECC-wide load in 2021 was adjusted downward by 3.5% in order to account for the expected impact of both customer-funded EE programs and federal standards.

Finally, Figure 5 compares the WECC Common Case load forecasts across balancing authorities, in terms of their compound annual growth rates (CAGR) over the 2010-2021 period (based on actual 2010 load). The figure also shows the reduction in the CAGR resulting from the adjustments made to each BA load forecast. In aggregate, the WECC Common Case load forecast for the entire Western Interconnection corresponds to a CAGR of 1.3%, and the various

adjustments to individual BA load forecasts resulted in a 0.3% reduction of the WECC-wide CAGR.

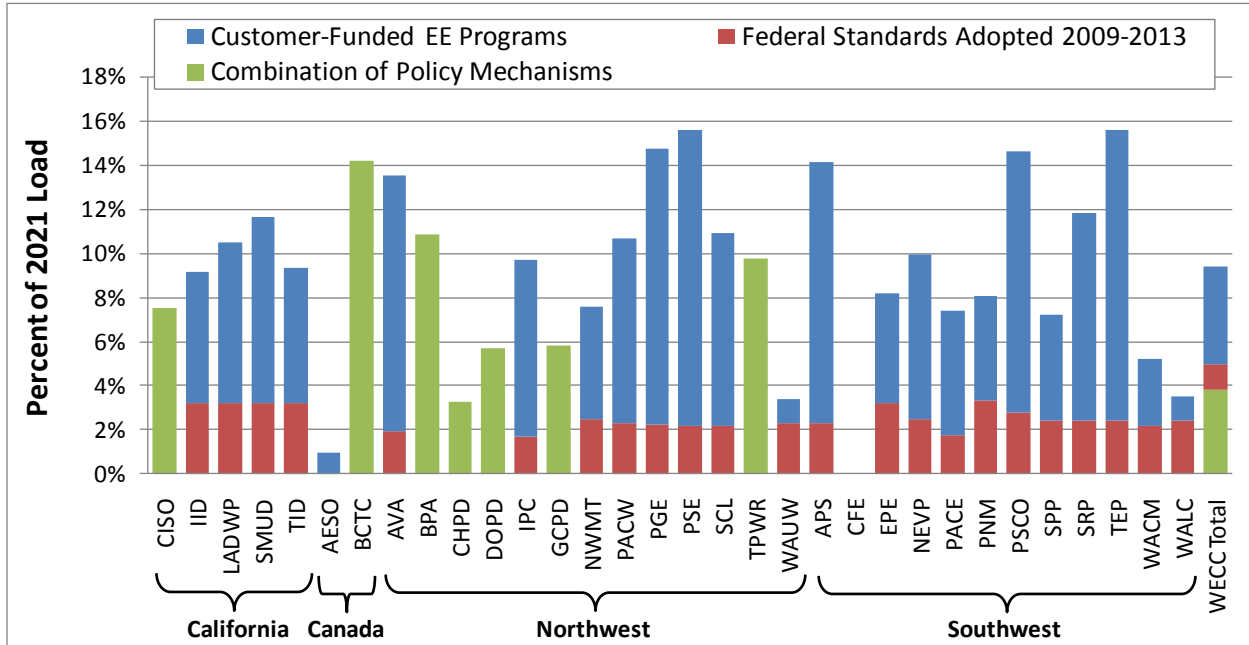


Figure 3. Expected Savings from Energy Efficiency Programs and Policies Implemented over the 2011-2021 Period

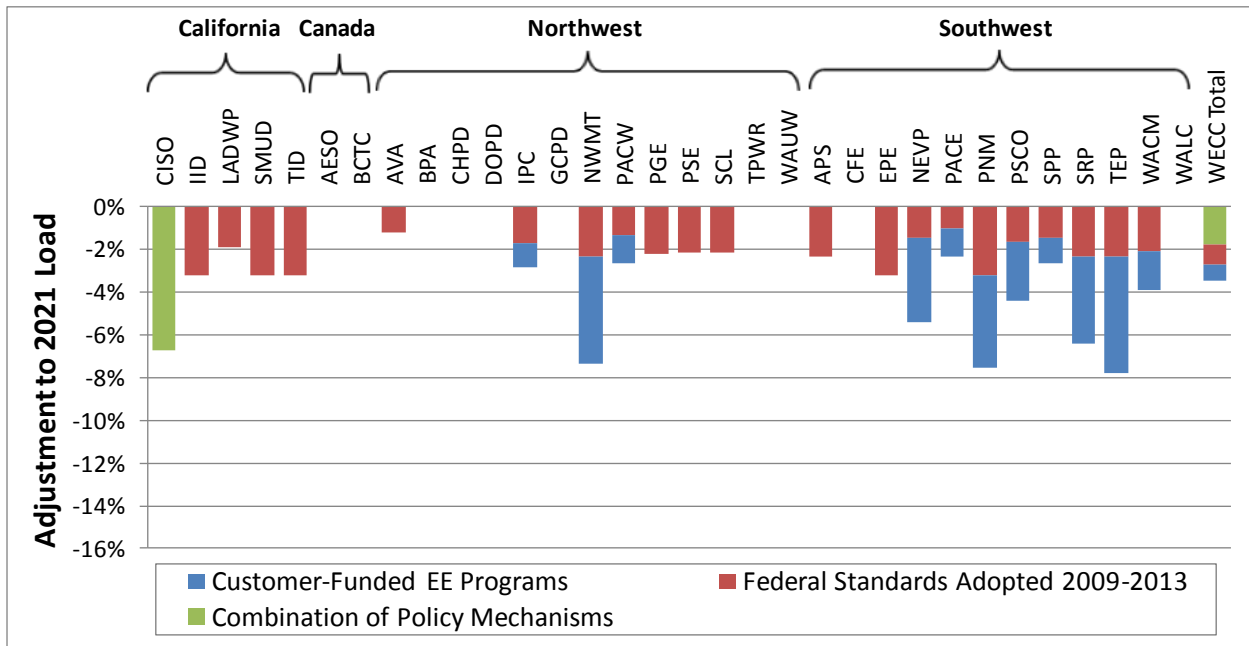
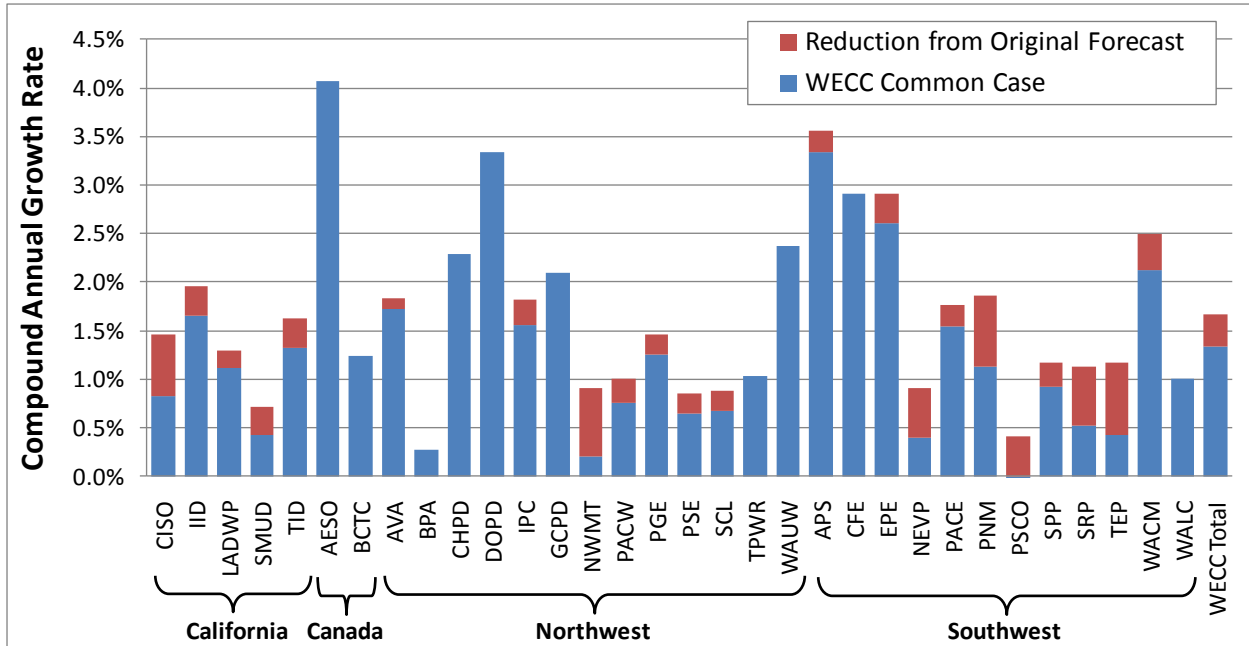


Figure 4. Adjustments to the Original Balancing Authority Load Forecasts



**Figure 5. Compound Annual Growth Rate (2010-2021) of WECC Common Case Load Forecasts and the Effect of Adjustments to the Original Load Forecasts**