SPSC High DSM Load Forecast: Nevada

Overview

Tables 1 and 2 present the High DSM load forecasts (Column D) for the balancing authorities in Nevada, compared to the State-Adjusted (SPSC Reference Case) load forecasts. Table 3 directly compares the underlying energy efficiency projections for the reference case and High DSM case, in terms of their percentage of the hypothetical load forecast with no future energy efficiency savings. The remainder of this document explains how the High DSM scenario efficiency savings projections were developed for each balancing authority.

Table 1. High DSM Load Forecasts for 2020: Annual Electricity Consumption (GWh)

Balancing Authority (In-State Portion)	A	B	C	D = A - (C - B)	E = (D/A - 1)
	State Adjusted (Reference Case) Load Forecast	Reference Case Efficiency Savings	High DSM Efficiency Savings	High DSM Load Forecast	Percent Change from State-Adjusted Load Forecast
	(GWh)	(GWh)	(GWh)	(GWh)	(%)
NEVP	27,171	3,203	8,092	22,282	-18%
SPP	12,255	1,267	2,830	10,692	-13%
State Total	**39,426**	**4,470**	**10,922**	**32,974**	**-16%**

Table 2. High DSM Load Forecasts for 2020: Annual Peak Demand (MW)

Balancing Authority (In-State Portion)	A	B	C	D = A - (C - B)	E = (D/A - 1)
	State Adjusted (Reference Case) Load Forecast	Reference Case Efficiency Savings	High DSM Efficiency Savings	High DSM Load Forecast	Percent Change from State-Adjusted Load Forecast
	(MW)	(MW)	(MW)	(MW)	(%)
NEVP	6,331	725	1,473	5,583	-12%
SPP	2,024	286	508	1,802	-11%
State Total	**8,355**	**1,012**	**1,981**	**7,385**	**-12%**

Table 3. Comparison of Reference Case and High DSM Case (2020 Cumulative Savings)

Balancing Authority (In-State Portion)	Reference Case Savings (% of Load Forecast w/o EE)		High DSM Case Savings (% of Load Forecast w/o EE)	
	GWh	MW	GWh	MW
NEVP	11%	10%	27%	21%
SPP	9%	12%	21%	22%
State Total	**10%**	**11%**	**25%**	**21%**

Note: The percentages in this table were calculated by dividing the savings projection by the sum of the savings projection and the post-savings load forecast (e.g., High DSM savings divided by High DSM savings plus High DSM

load forecast)

High DSM Scenario Savings Projection

The SPSC 2010 Study Request specifies that the High DSM Scenario will be based on achievement of all cost-effective energy efficiency savings (i.e., the "economic potential") in each balancing authority, and the DSM working group has executed this request by relying on recent energy efficiency potential studies conducted for utilities and states in the region. There have not been any recent energy efficiency potential studies for Nevada utilities that include an estimate of the economic potential. The DSM working group therefore developed an estimate of economic potential for Nevada, by extrapolating the results of the 2010 energy efficiency potential study conducted for Salt River Project (Cadmus, 2010).[1] Table 4 summarizes the technical and economic potential estimates from the SRP study, for the year 2020.[2]

Table 4. SRP Energy Efficiency Potential Estimates (2020)

Sector	2020 Baseline Sales (GWh)[1]	Net Technical Potential		Net Economic Potential	
		GWh	% of Baseline	GWh	% of Baseline
Residential	14,882	5,438	37%	5,015	34%
Commercial	10,268	3,562	35%	3,370	33%
Industrial	6,420	747	12%	677	11%
Total	31,571	9,747	31%	9,063	29%

Source: Cadmus (2010), Table 13

[1] Note that the 2020 baseline sales projection in the energy efficiency potential study, which is based on end-use level forecasting model, is significantly lower than the 2020 load forecast that SRP submitted to WECC in early 2010 (40,382 GWh, or 41,160 GWh with embedded energy efficiency savings "added back in"). In principle, had the baseline forecast used in the potential study been calibrated to the WECC forecast, the resulting energy efficiency potential estimate would likely be higher in absolute terms.

The potential estimates presented in the SRP study represent savings at the customer meter. For the purpose of developing a High DSM load forecast, the savings must be scaled up to the bus-bar to account for avoided T&D losses (see Table 5).

[1] There have been several other energy efficiency potential studies conducted for southwestern utilities within the past five years, none of which are suitable for extrapolation to Nevada. These studies include: a 2007 potential study for Arizona Public Service (APS), a 2006 study for Public Service New Mexico (PNM), a 2007 potential study for Rocky Mountain Power, and a 2010 study for Tri-State Generation and Transmission Cooperative (whose service territory extends into northern New Mexico).

[2] Note that these estimates represent savings at the customer meter and are net of naturally occurring energy efficiency savings expected to materialize over the 2010-2020 timeframe.

Table 5. Estimated Economic Potential at the Generator Bus-Bar

Sector	Marginal T&D Losses[1]	Net Economic Potential	
		Customer Meter	Bus-Bar
Residential	10%	5,015	5,572
Commercial	9%	3,370	3,703
Industrial	8%	677	736
Total	n/a	9,063	10,011

[1] Marginal T&D loss factors are the relevant metric for estimating avoided T&D losses from DSM, and are higher than average T&D loss factors because resistive losses increase exponentially with load.

The SRP potential study provided estimates of energy savings, but not peak demand savings. We therefore estimate the peak demand savings associated with SRP's economic potential energy efficiency estimate by applying a stipulated peak-to-energy savings ratio for each sector, based on the median value across other potential studies conducted for utilities in the Southwest (see Table 6). As shown in Table 7, applying these sectoral peak-to-energy savings ratios to SRP yields an estimated economic potential peak demand savings of 1,911 MW.

Table 6. Peak-to-Energy Savings Ratios from a Sample of Energy Efficiency Potential Studies

Utility/Region	Study	Residential	Commercial	Industrial
Public Service Colorado	KEMA (2010)	0.29	0.20	0.14
Public Service New Mexico	Itron (2006)	0.21	0.18	0.10
Tri-State (NM)	Nexant (2010)	0.17	0.19	0.21
Arizona Public Service	ICF (2007)	0.18	0.21	n/a
Median Value		0.19	0.20	0.14

Table 7. Estimated Peak Demand Savings Economic Potential

Sector	Net Economic Potential		
	GWh	MW/GWh	MW
Residential	5,572	0.19	1078
Commercial	3,703	0.20	728
Industrial	736	0.14	105
Total	10,011	0.19	1,911

Finally, we extrapolate the SRP potential study results to the two balancing authorities in Nevada, on a sector-by-sector basis, in proportion to the 2008 retail sales in each balancing authority (see Table 8). While we recognize that this is a simplistic approach, and ignores potential differences in demographics, climate, and end-use characteristics, we also believe that it is a reasonable approximation given the data and resources available.

Table 8. Extrapolation of Net Economic Potential to Other Arizona Balancing Authorities

Balancing Authority	Residential	Commercial	Industrial	Total
Retail Sales (GWh, Bundled + Delivery)[1]				
SRP	12,775	11,245	3,379	27,399
NEVP	9,600	6,010	8,842	24,452
SPP	2,262	3,086	3,795	9,143
Net Economic Potential in 2020 (GWh)				
SRP	5,572	3,703	736	10,011
NEVP	4,187	1,979	1,926	8,092
SPP	987	1,016	826	2,830
Net Economic Potential in 2020 (MW)				
SRP	1,078	728	105	1,911
NEVP	810	389	274	1,473
SPP	191	200	117	508

[1] Data Source: EIA-861 retail sales data for 2008.