DOCKETED

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CEC statement to accompany SB 350 2030 EE Savings Doubling Goal Workbook

Senate Bill 350, the Clean Energy and Pollution Reduction Act of 2015 (de León, Chapter 547, Statues of 2015) (SB 350) directs the Energy Commission to, by November 2017, establish annual targets that will achieve a doubling of statewide energy efficiency (EE) savings by 2030, so long as doing so is cost-effective, feasible, and "will not adversely impact public health and safety." The Energy Commission staff paper, *Framework for Establishing the Senate Bill 350 Energy Efficiency Savings Doubling Targets* (Docket # 17-IEPR-06, TN 215437), proposed that Energy Commission staff would, in a public process, propose sectoral EE savings targets based on cost-effective and feasibility evaluations. These sectoral EE savings targets will be discussed in a workshop in summer 2017 and will be considered for adoption by the Energy Commission on or before November 1, 2017. The *Framework* paper proposed that these sectoral targets be updated biennially to reflect changes in cost-effective and feasible EE potential over time through the Integrated Energy Policy Report (IEPR) process. The *Framework* paper further proposed that the Energy Commission also consider for adoption on or before November 1, 2017 a goal of doubling EE savings by 2030; this goal would not be updated in future IEPRs. The *Framework* paper proposed that this goal would be in accordance with direction from the statute, based on a doubling of the mid-case Additional Achievable Energy Efficiency (AAEE) from the *California Energy Demand Updated Forecast, 2015–2025*[1], extended to 2030 using an average annual growth rate. This workbook contains the 2014 AAEE and 2013 publically owned utility (POU) goal[2].

In the Energy Commission *Framework* staff paper, staff indicated that adjustments were needed to the 2014 AAEE energy savings published in the *California Energy Demand Updated Forecast, 2015–2025*. (pp 5,13.) After closer review, Energy Commission staff determined that changes to these 2014 AAEE energy savings were not needed. Although updates and improvements have been made since 2014 to the CPUC's potential and goals model used to derive the 2014 AAEE energy savings estimates, SB 350 explicitly references the 2014 AAEE numbers published in the *California Energy Demand Updated Forecast, 2015–2025.* For this reason, the Energy Commission intends to use the 2014 AAEE energy savings numbers, without subsequent adjustments, and the 2013 POU energy savings goals, to establish the statewide annual doubling targets.

The docketed workbook named "SB 350 EE Targets_baseline savings & doubling_GWh_MMtherms_04132017_4docket" includes the 2014 AAEE and the 2013 POU goals. This workbook also documents how the statewide annual doubling targets are calculated, and includes these targets expressed in site GWh, MW, MM Therms, and Quad Btus. The following pages are printouts of the docketed workbook.

[1] California Energy Commission, December 2014.
http://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SD.pdf
[2] Energy Efficiency in California's Public Power Sector, March 2013.
http://www.ncpa.com/wp-content/uploads/2015/02/FINALv3-SB-1037-AB-2021-Report-Appendices3.pdf

SB 350 2030 EE Savings Doubling Goal

CEDU 2014 mid-case AAEE X2 extended to 2030

1 PURPOSE

The purpose of this workbook is to publish a draft of the goal of doubling energy efficiency (EE) savings by 2030. SB 350 calls upon the Energy Commission to establish a goal of doubling EE savings by 2030, extended to 2030 using an average annual growth rate. As a basis for calculating this goal, SB 350 directs the Energy Commission to double the mid-case AAEEE found in the CED 2014. This workbook contains the 2014 AAEE & 2013 POU energy efficiency goals that will be used as the baseline for the SB 350 2030 energy efficiency savings doubling goal. The electricity and natural gas efficiency savings in the 2014 CED are doubled, to establish annual energy savings targets from 2018-2030. These GWh and Therm saving targets are then converted to site Quad BTU savings. As laid out in the January 2017 Staff Draft Implementation Framework Paper, the Energy Commission will establish sectoral energy efficiency targets based on cost effective and feasibility evaluations--the sum of these savings targets will be compared against the 2030 EE savings doubling goal found in this workbook. While the sectoral targets may change over time, based on changing conditions, the goal of doubling EE savings by 2030 found in this workbook should not.

2 SCOPE

a 2014 AAEE from CPUC energy efficiency ratepayer funded programs, State and Federal Appliance Standards, and State Building Energy Efficiency Standards

b 2013 POU energy efficiency goals

3 WORKSHEET CONTENTS/OBJECTIVE

a worksheet "**2014AAEE**" is the source for projections used to establish the portion of the statewide target as required by the SB 350 legislation

b worksheet "**POU2013Goals**" is the source for projections used to establish the portion of the statewide target as required by the SB 350 legislation

c worksheet "**Doubling Targets**" calculates the statewide SB 350 energy saving targets in GWh, MM Therms, site Quad BTU, and source GHG. Two different assumptions are included for the average annual growth rate used to extend the savings from 2025 to 2030. The 3% growth rate is what was explained in the January 2017 Framework paper. The second assumption uses a growth rate consistent with the trend line of the 2015-2025 savings series.

d Chart "Electricity Doubled EE" illustrates the total site electricity savings estimated from the SB 350 targets, using two different growth rates from 2025 to 2030 - current Energy Commission proposal is to use the growth rate corresponding to the trend line of the 2013-14 AAEE & POU savings

e Chart "Natural Gas Doubled EE" illustrates the total site gas savings estimated from the SB 350 targets, using two different growth rates from 2025 to 2030 - current Energy Commission proposal is to use the growth rate corresponding to the trend line of the 2013-14 AAEE & POU savings

f Chart "BTU Doubled EE" illustrates the total site BTU savings estimated from the SB 350 targets, using two different growth rates from 2025 to 2030 - current Energy Commission proposal is to use the growth rate corresponding to the trend line of the 2013-14 AAEE & POU savings

Date: April 4, 2017
Compilers of Data: Mike Jaske & Martha Brook

Additional Achievable Energy Efficiency Savings For Sum of IOU Service Territories

California Energy Demand Updated Forecast, 2015-2025, Mid Savings Scenario (non-coincident, no losses)

Program Category	Type	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Emerging Technologies	Peak (MW)	-	-	9	24	48	80	122	179	256	347	455	581	739
Other Program Measures	Peak (MW)	-	-	229	459	679	836	1,011	1,132	1,268	1,413	1,600	1,785	1,986
Appliance Standards	Peak (MW)	-	-	193	457	682	934	1,143	1,353	1,554	1,752	1,938	2,115	2,301
Building Standards	Peak (MW)	-	-	-	-	6	23	40	64	96	126	157	189	227
Total Savings	Peak (MW)	-	-	431	940	1,416	1,872	2,317	2,728	3,173	3,638	4,150	4,670	5,253
Emerging Technologies	Energy (GWh)	-	-	101	234	405	608	860	1,187	1,692	2,189	2,771	3,426	4,222
Other Program Measures	Energy (GWh)	-	24	1,317	2,599	3,790	4,566	5,460	6,088	6,802	7,637	8,600	9,539	10,550
Appliance Standards	Energy (GWh)	-	376	918	1,780	2,584	3,406	4,176	4,917	5,502	6,043	6,523	6,958	7,397
Building Standards	Energy (GWh)	-	-	-	-	11	48	85	134	204	273	345	432	538
Total Savings	Energy (GWh)	workshee	400	2,337	4,613	6,789	8,628	10,581	12,327	14,200	16,142	18,240	20,354	22,707
Emerging Technologies	Natural Gas (MM Therms)	-	-	0	1	2	5	8	12	18	25	32	42	54
Other Program Measures	Natural Gas (MM Therms)	-	1	29	56	83	112	143	170	200	230	259	288	320
Appliance Standards	Natural Gas (MM Therms)	-	(6)	(8)	(7)	(7)	(4)	1	6	11	15	19	22	27
Building Standards	Natural Gas (MM Therms)	-	-	-	-	0	1	3	4	6	8	10	13	15
Total Savings	Natural Gas (MM Therms)	-	(4)	21	50	78	114	154	193	235	277	321	365	416

Note:
2014 AAEE also documented here: **CEC-200-2014-009-CMF**, pg. 44, *Table 26: AAEE Savings by Utility, Mid AAEE Scenario*

SB 350 2030 EE Savings Doubling Goal

CEDU 2014 mid-case AAEE X2 extended to 2030

All POUs - Annual Targets (MWh), 2014 - 2023

Utility	Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Alameda	Annual	1,154	1,100	1,158	1,247	1,061	1,081	1,108	1,196	1,346	1,617
Anaheim	Annual	24,026	24,425	24,228	25,742	24,585	24,842	25,254	25,480	25,567	25,204
Azusa	Annual	2,570	2,585	2,568	2,573	2,342	2,438	2,411	2,567	2,386	2,316
Banning	Annual	472	546	532	591	573	621	715	730	802	852
Biggs	Annual	35	39	42	46	47	49	51	52	52	51
Burbank	Annual	9,947	10,739	11,124	11,281	10,852	11,677	12,111	13,037	12,977	12,829
Colton	Annual	966	1,273	1,614	1,759	1,911	2,137	2,435	2,610	3,804	3,712
Corona	Annual	313	316	326	334	325	359	374	361	374	385
Glendale	Annual	11,782	11,671	11,151	11,607	11,486	11,371	12,120	12,830	13,214	13,548
Gridley	Annual	170	170	170	170	170	170	170	170	170	170
Healdsburg	Annual	260	266	293	336	348	382	429	441	598	535
Imperial	Annual	14,508	14,986	15,563	16,656	16,014	17,001	18,073	19,091	19,419	19,240
LADWP	Annual	278,000	310,000	442,000	515,000	541,000	520,000	471,000	240,000	161,000	118,000
Lassen	Annual	249	266	268	290	305	313	338	333	347	364
Lodi	Annual	2,735	2,904	3,155	3,492	3,359	3,543	3,617	3,737	4,311	5,081
Lompoc	Annual	168	186	203	229	195	212	232	246	258	268
Merced	Annual	1,581	1,486	1,179	1,392	1,140	1,040	1,099	1,148	1,386	1,274
Modesto	Annual	15,950	17,104	18,196	18,986	18,254	18,974	19,233	19,162	18,770	17,862
Moreno Valley	Annual	286	276	269	277	251	272	284	303	304	309
Needles	Annual	72	90	107	128	139	159	177	195	215	229
Palo Alto	Annual	6,078	6,257	6,248	6,245	6,248	6,260	6,809	6,846	7,412	7,452
Pasadena	Annual	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750
Pittsburg Power	Annual	140	134	122	123	128	124	122	120	125	122
Plumas-Sierra	Annual	126	128	144	146	133	128	178	150	233	198
Port of Oakland	Annual	91	97	101	104	103	106	108	111	108	105
Rancho Cucamonga	Annual	441	449	470	509	550	598	600	656	634	711
Redding	Annual	3,045	3,224	3,318	3,458	3,207	3,384	3,581	3,857	4,207	4,349
Riverside	Annual	18,399	19,099	18,870	19,756	19,317	20,287	23,368	24,469	25,889	25,865
Roseville	Annual	7,713	7,768	8,037	8,007	7,499	7,790	7,260	7,697	8,094	8,479
SF PUC	Annual	4,353	4,353	4,857	4,857	4,857	2,970	2,536	2,806	2,806	2,806
Shasta Lake	Annual	230	524	299	239	261	243	256	269	361	368
Silicon Valley	Annual	24,076	24,387	23,079	22,848	22,407	21,274	20,961	20,174	18,923	18,282
SMUD	Annual	172,000	175,000	178,000	180,000	182,000	184,000	186,000	187,000	189,000	191,000
Trinity	Annual	68	86	103	122	118	143	161	180	203	219
Truckee Donner	Annual	1,367	1,521	1,558	1,552	1,080	1,134	1,103	1,121	1,198	1,204
Turlock	Annual	9,570	10,081	13,232	11,996	13,674	12,666	13,698	15,601	16,159	17,372
Ukiah	Annual	450	450	448	428	364	404	395	391	414	423
Vernon	Annual	6,417	6,631	6,609	6,664	6,592	6,561	6,454	6,377	7,060	7,065
Victorville	Annual	102	124	146	172	202	231	260	291	341	370
CALIFORNIA	Annual	632,660	673,491	812,537	892,111	915,847	897,694	857,831	634,555	563,217	522,986
Cumulative		632,660	1,306,151	2,118,688	3,010,799	3,926,646	4,824,340	5,682,171	6,316,726	6,879,943	7,402,929	MWh
Cumulative		632.66	1306.151	2118.688	3010.799	3926.646	4824.34	5682.171	6316.726	6879.943	7402.929	GWh

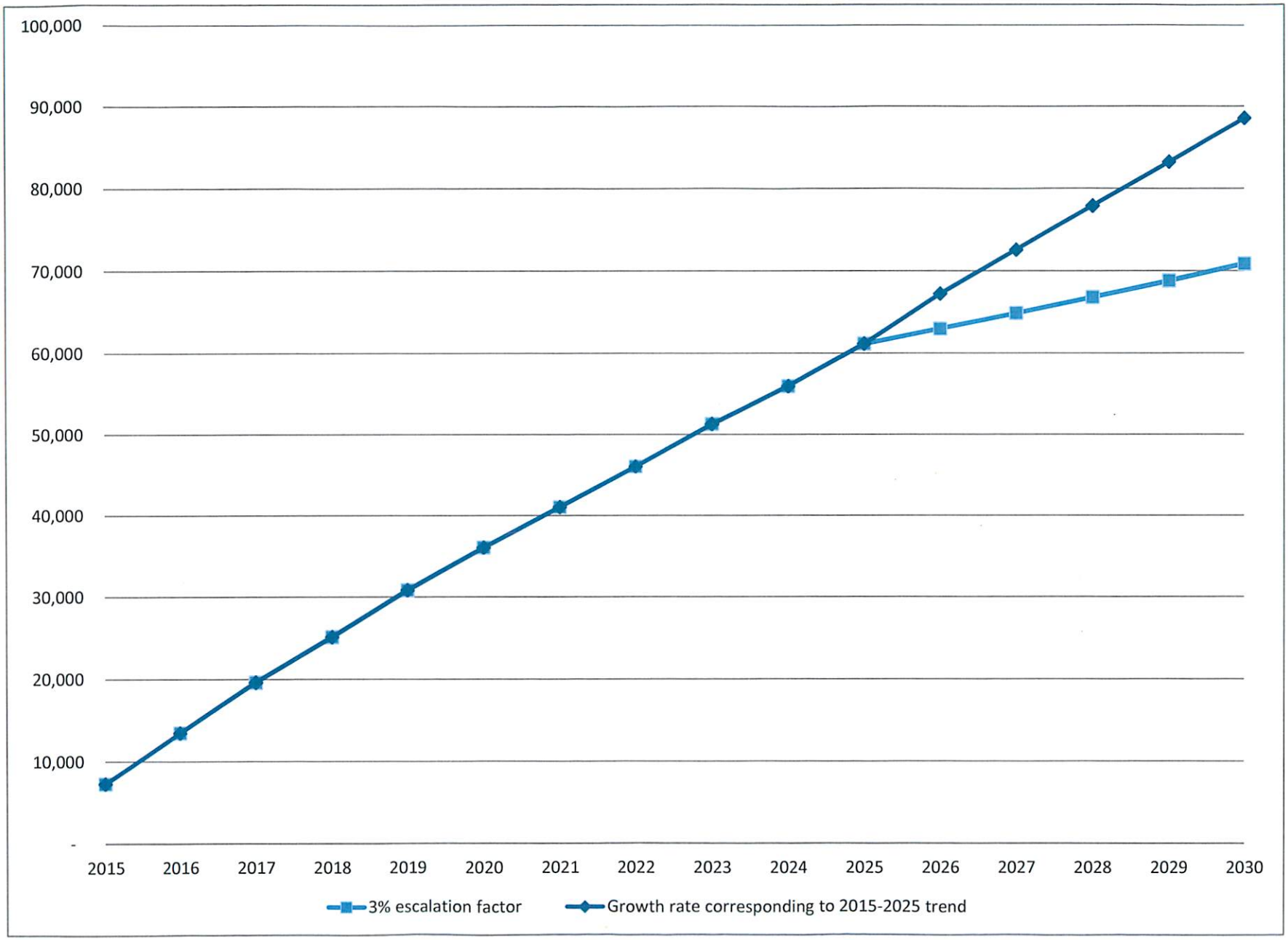
SB 350 2030 EE Savings Doubling Goal

CEDU 2014 mid-case AAEE X2 extended to 2030

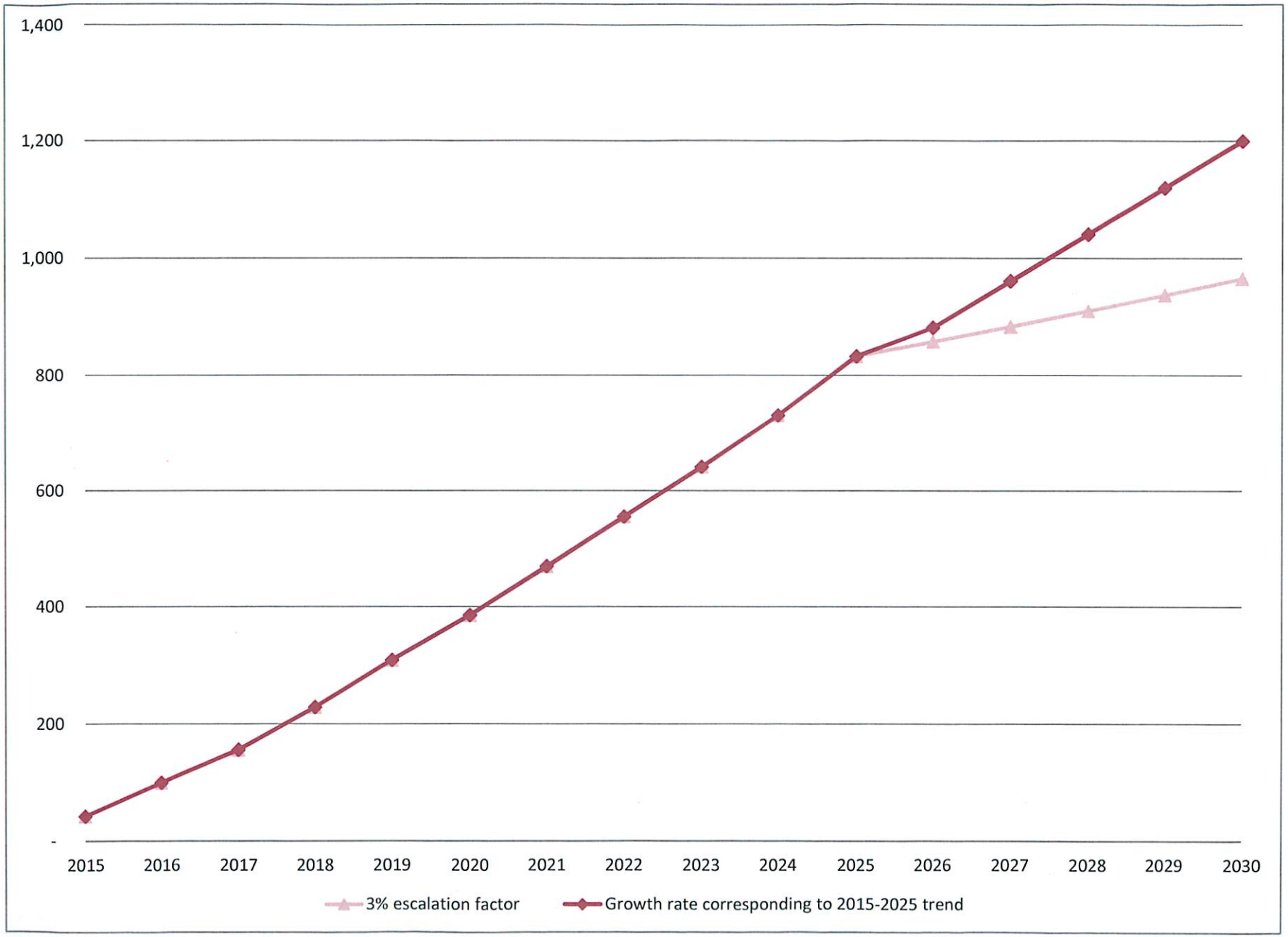
				2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ELECTRICITY SAVINGS																				
Baseline Energy Savings		**Escalation Factor**																		
IOUs	2014 AAEE Projections	1.03	GWH		2,337	4,613	6,789	8,628	10,581	12,327	14,200	16,142	18,240	20,354	22,707	23,388	24,090	24,813	25,557	26,324
POUs	2013 POU SB 1037 Report	1.03	GWh		1,306	2,119	3,011	3,927	4,824	5,682	6,317	6,880	7,403	7,625	7,854	8,089	8,332	8,582	8,839	9,105
Total	2014 AAEE/2015 POU		GWh		3,643	6,732	9,800	12,554	15,406	18,009	20,517	23,022	25,643	27,979	30,561	31,478	32,422	33,395	34,396	35,428
IOUs	2014 AAEE Projections	Growth rate corresponding to 2015-2025 trend	GWh		2,337	4,613	6,789	8,628	10,581	12,327	14,200	16,142	18,240	20,354	22,707	24,328	26,308	28,288	30,268	32,249
POUs	2013 POU SB 1037 Report	Growth rate corresponding to 2015-2025 trend	GWh		1,306	2,119	3,011	3,927	4,824	5,682	6,317	6,880	7,403	7,625	7,854	9,286	9,971	10,656	11,341	12,026
Total	2014 AAEE/2015 POU		GWh		3,643	6,732	9,800	12,554	15,406	18,009	20,517	23,022	25,643	27,979	30,561	33,614	36,279	38,945	41,610	44,275
NATURAL GAS SAVINGS																				
Baseline Energy Savings		**3% escalation factor**																		
IOUs	2014 AAEE Projections	1.03	MM Therms		21	50	78	114	154	193	235	277	321	365	416	428.86	441.73	454.98	468.63	482.69
POUs	2013 POU SB 1037 Report	1.03	MM Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total			MM Therms		21	50	78	114	154	193	235	277	321	365	416	428.86	441.73	454.98	468.63	482.69
IOUs	2014 AAEE Projections	Growth rate corresponding to 2015-2025 trend	MM Therms		21	50	78	114	154	193	235	277	321	365	416	441	480.56	520.33	560.09	599.85
POUs	2013 POU SB 1037 Report	Growth rate corresponding to 2015-2025 trend	MM Therms																	
Total			MM Therms		21	50	78	114	154	193	235	277	321	365	416	441	481	520	560	600
FINAL ENERGY SAVING TARGETS																				
Electricity	*x2 row 6*		GWH		7,286	13,464	19,600	25,109	30,811	36,018	41,034	46,044	51,286	55,959	61,122	62,955	64,844	66,789	68,793	70,857
Natural Gas	*x2 row 12*		MM Therms		42	99	156	228	309	385	469	555	641	731	833	858	883	910	937	965
Electricity	*x2 row 9*	Growth rate corresponding to 2015-2025 trend	GWH		7,286	13,464	19,600	25,109	30,811	36,018	41,034	46,044	51,286	55,959	61,122	67,229	72,559	77,889	83,219	88,549
Natural Gas	*x2 row 18*	Growth rate corresponding to 2015-2025 trend	MM Therms		42	99	156	228	309	385	469	555	641	731	833	882	961	1,041	1,120	1,200
TARGETS CONVERTED TO SITE BTU																				
	BTU Conversion Factor	3.413	BTU/Wh																	
	Doubled 2014 AAEE+2013 POU	- Electric Energy w/ 3% escalation for 2025-2030	3.413 x 10^-6 QUAD/GWh		0.025	0.046	0.067	0.086	0.105	0.123	0.140	0.157	0.175	0.191	0.209	0.215	0.221	0.228	0.235	0.242
	Doubled 2014 AAEE+2013 POU	- Electric Energy w/ linear trend for 2025-2030			0.025	0.046	0.067	0.086	0.105	0.123	0.140	0.157	0.175	0.191	0.209	0.229	0.248	0.266	0.284	0.302
	BTU Conversion Factor	100,000	10^5 BTU/Therm																	
	Doubled 2014 AAEE+2013 POU	- Natural Gas w/ 3% escalation for 2025-2030	QUAD = 10^15 BTU; MM Therm = 10^6 Therm *So divide by 10^9*		0.004	0.010	0.016	0.023	0.031	0.039	0.047	0.055	0.064	0.073	0.083	0.086	0.088	0.091	0.094	0.097
	Doubled 2014 AAEE+2013 POU	- Natural Gas w/ linear trend for 2025-2030			0.004	0.010	0.016	0.023	0.031	0.039	0.047	0.055	0.064	0.073	0.083	0.088	0.096	0.104	0.112	0.120
	Combined - Electricity and Natural	w/ 3% escalation for 2025-2030	Quad BTU		0.029	0.056	0.082	0.109	0.136	0.161	0.187	0.213	0.239	0.264	0.292	0.301	0.310	0.319	0.329	0.338
	Combined - Electricity and Natural	w/ linear trend for 2025-2030	Quad BTU		0.029	0.056	0.082	0.109	0.136	0.161	0.187	0.213	0.239	0.264	0.292	0.318	0.344	0.370	0.396	0.422

REFERENCE SOURCE VALUES *Original*		**Worksheet**		**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
IOUs	2014 AAEE Projections	2014AAEE	GWh	400	2,337	4,613	6,789	8,628	10,581	12,327	14,200	16,142	18,240	20,354	22,707					
POUs	2013 POU SB 1037 Report	POU2013Goals	GWh	633	1,306	2,119	3,011	3,927	4,824	5,682	6,317	6,880	7,403							
IOUs	2014 AAEE Projections	2014AAEE	MM Therms	-4	21	50	78	114	154	193	235	277	321	365	416					
POUs	2013 POU SB 1037 Report	POU2013Goals	MM Therms	0	0	0	0	0	0	0	0	0	0							

Statewide Electricity Savings Doubled



Statewide Natural Gas Savings Doubled



Statewide Site BTU Savings Doubled