

Source: CAC DR 3-06

Sector	Customers			Sales (MWh)	
	Eligible for Opt Out	Opted Out	% Opted Out	Eligible for Opt Out	Opted Out
Commercial	43	11	26%	169,771	58,827
Industrial	226	93	41%	4,178,765	2,767,538
Total C&I	269	104	39%	4,348,536	2,826,365

% Opted Out
35%
66%
65%

From Exhibit A-4

Historical 9
Forecast 19

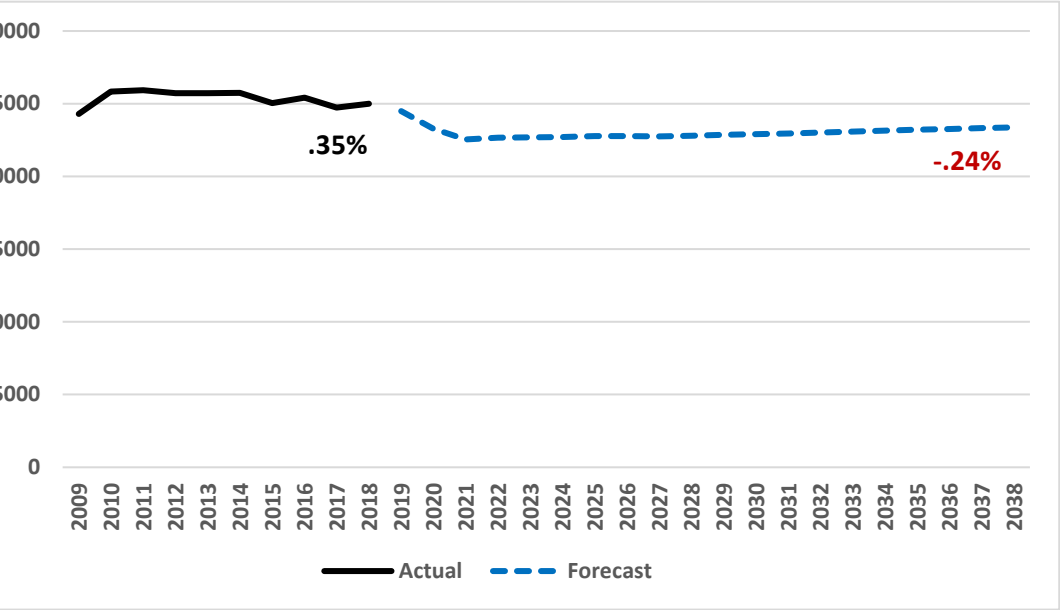
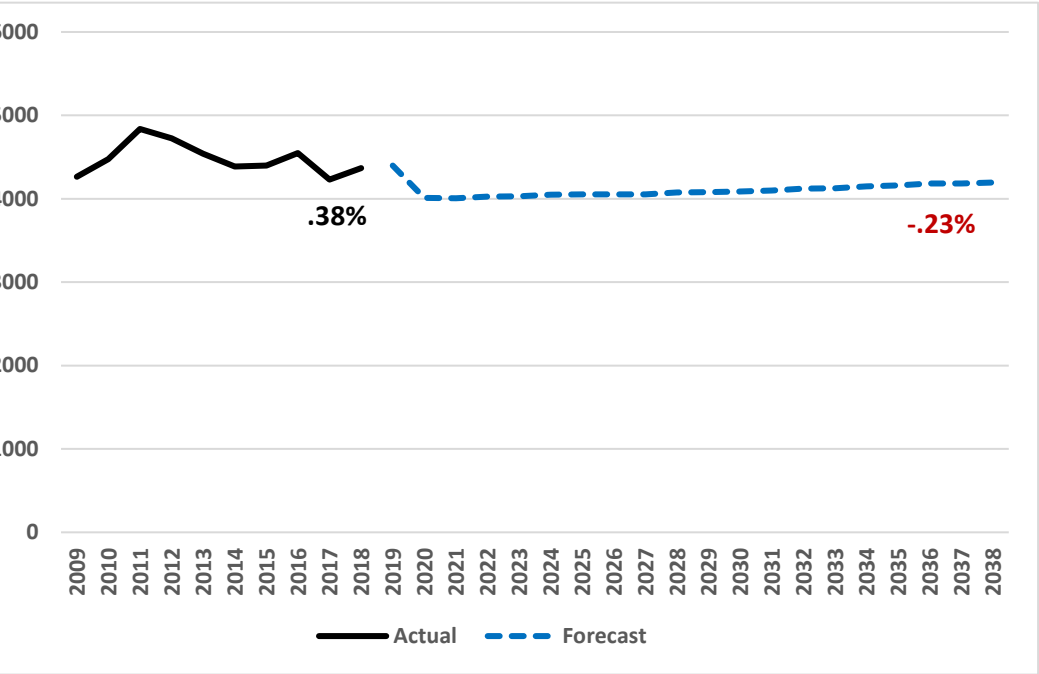
	Summer Peak				Preceding Winter Peak			
	Date	Actual	Forecast	% Growth	Date	Actual	Forecast	% Growth
2009	6/25/2019	4262			1/15/2009	3728		
2010	7/23/2010	4474		5.0%	12/10/2009	3858		3.5%
2011	7/21/2011	4837		8.1%	12/13/2010	3785		-1.9%
2012	7/6/2012	4726		-2.3%	1/20/2012	3686		-2.6%
2013	9/10/2013	4540		-3.9%	1/22/2013	3782		2.6%
2014	9/5/2014	4388		-3.3%	1/22/2014	3938		4.1%
2015	7/28/2015	4398		0.2%	1/14/2015	3952		0.4%
2016	8/11/2016	4547		3.4%	1/13/2016	3702		-6.3%
2017	7/19/2017	4230		-7.0%	12/15/2016	3795		2.5%
2018	6/18/2018	4369		3.3%	1/16/2018	3723		-1.9%
2019			4398	0.7%			3770	1.3%
2020			4012	-8.78%			3582	-5.0%
2021			4006	-0.15%			3362	-6.1%
2022			4026	0.50%			3378	0.5%
2023			4029	0.07%			3381	0.1%
2024			4050	0.52%			3395	0.4%
2025			4051	0.02%			3412	0.5%
2026			4053	0.05%			3413	0.0%
2027			4052	-0.02%			3410	-0.1%
2028			4074	0.54%			3418	0.2%
2029			4080	0.15%			3412	-0.2%
2030			4088	0.20%			3415	0.1%
2031			4100	0.29%			3423	0.2%
2032			4122	0.54%			3430	0.2%
2033			4126	0.10%			3437	0.2%
2034			4147	0.51%			3433	-0.1%
2035			4160	0.31%			3442	0.3%
2036			4183	0.55%			3450	0.2%
2037			4183	0.00%			3455	0.1%
2038			4196	0.31%			3463	0.2%

2019*Total energy requirements reflect 3 months actual and 9 months forecast data

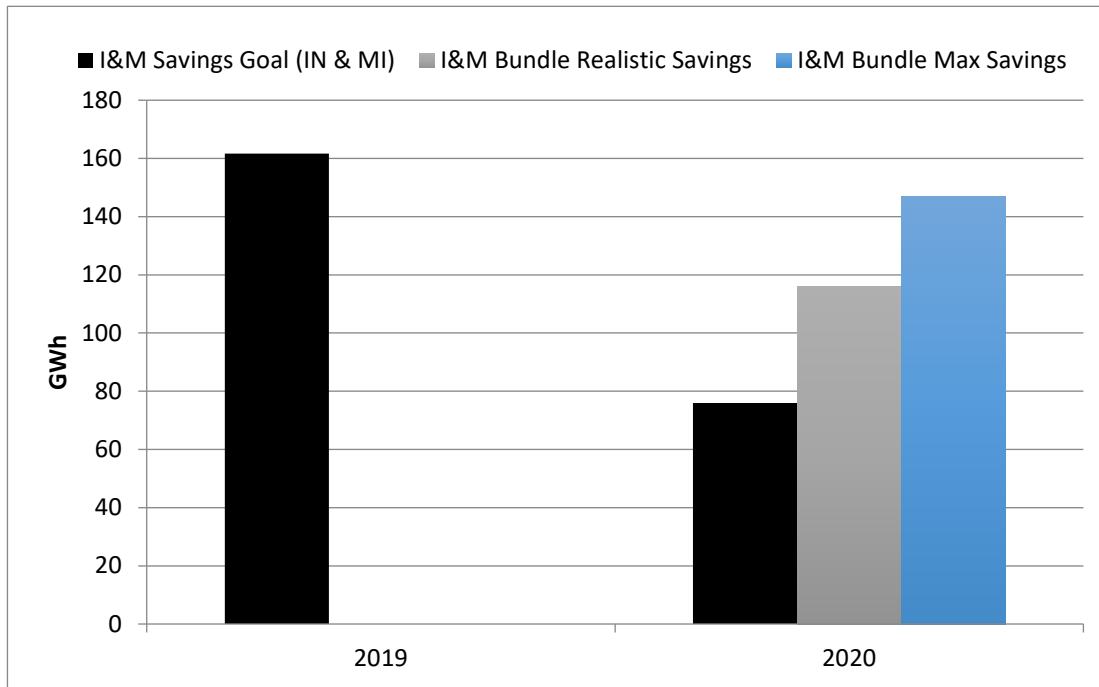
Peak			Energy and Load Forecactor			
Actual	Forecast	% Growth	Actual	Forecast	% Growth	Load Factor
4262			24297			65.1%
4474		5.0%	25829		6.3%	65.9%
4837		8.1%	25929		0.4%	61.2%
4726		-2.3%	25731		-0.8%	62.0%
4540		-3.9%	25719		0.0%	64.7%
4388		-3.3%	25741		0.1%	67.0%
4398		0.2%	25047		-2.7%	65.0%
4547		3.4%	25407		1.4%	63.6%
4230		-7.0%	24745		-2.6%	66.8%
4369		3.3%	25003		1.0%	65.3%
	4398	0.7%		24491	-2.0%	63.7%
	4012	-8.8%		23281	-4.9%	66.1%
	4006	-0.1%		22544	-3.2%	64.2%
	4026	0.5%		22657	0.5%	64.2%
	4029	0.1%		22686	0.1%	64.3%
	4050	0.5%		22700	0.1%	63.8%
	4051	0.0%		22765	0.3%	64.1%
	4053	0.0%		22768	0.0%	64.1%
	4052	0.0%		22754	-0.1%	64.1%
	4074	0.5%		22802	0.2%	63.7%
	4080	0.1%		22874	0.3%	64.0%
	4088	0.2%		22902	0.1%	64.0%
	4100	0.3%		22957	0.2%	63.9%
	4122	0.5%		23017	0.3%	63.6%
	4126	0.1%		23082	0.3%	63.9%
	4147	0.5%		23152	0.3%	63.7%
	4160	0.3%		23218	0.3%	63.7%
	4183	0.6%		23270	0.2%	63.3%
	4183	0.0%		23318	0.2%	63.6%
	4196	0.3%		23377	0.3%	63.6%



	Average Annual Growth		
	Summer Peak	Winter Peak	GWH
Historical	0.38%	0.04%	0.35%
Forecast	-0.23%	-0.43%	-0.24%



GWH	2017	2018	2019	2020
I&M Actual Savings (IN & MI)	125.206	123.467		
I&M Savings Goal (IN & MI)	164.2205	162.68077	161.67208	76
MPS Net Incremental Electric Savings, High	149.688	149.583	149.289	
MPS Net Incremental Electric Savings, Mid	128.798	129.278	129.335	
I&M Bundle Realistic Savings				115.921
I&M Bundle Max Savings				146.906



Installed Cost Yearly Potential Savings

From May 23 :

C&I	0.06	5411	\$	324,660
C&I	0.09	2599	\$	233,910
C&I	0.11	6417	\$	705,870
C&I	0.16	2624	\$	419,840
C&I	0.1	10216	\$	1,021,600
C&I	0.15	3921	\$	588,150
C&I	0.1	3093	\$	309,300
C&I	0.15	1109	\$	166,350
C&I	0.1	20482	\$	2,048,200
C&I	0.15	5707	\$	856,050
C&I	0.19	4036	\$	766,840
C&I	0.29	1770	\$	513,300
C&I	0.1	12149	\$	1,214,900

C&I	0.15	3799	\$	569,850
C&I	0.11	1788	\$	196,680
C&I	0.16	602	\$	96,320
Res	0.6	8759	\$	5,255,400
Res	0.9	1777	\$	1,599,300
Res	1.65	1516	\$	2,501,400
Res	2.48	696	\$	1,726,080
Res	0.26	4520	\$	1,175,200
Res	0.4	2238	\$	895,200
Res	0.24	6340	\$	1,521,600
Res	0.35	3225	\$	1,128,750
Res	0.64		\$	-
Res	0.97		\$	-
Res	0.1	28500	\$	2,850,000
Res	0.54	2694	\$	1,454,760
Res	0.81	919	\$	744,390

IN & MI 2019 Total Budget

19,402,136 MI Case No. U

Bundle Average Annual Spend (2020-2024)

30,883,900

Source

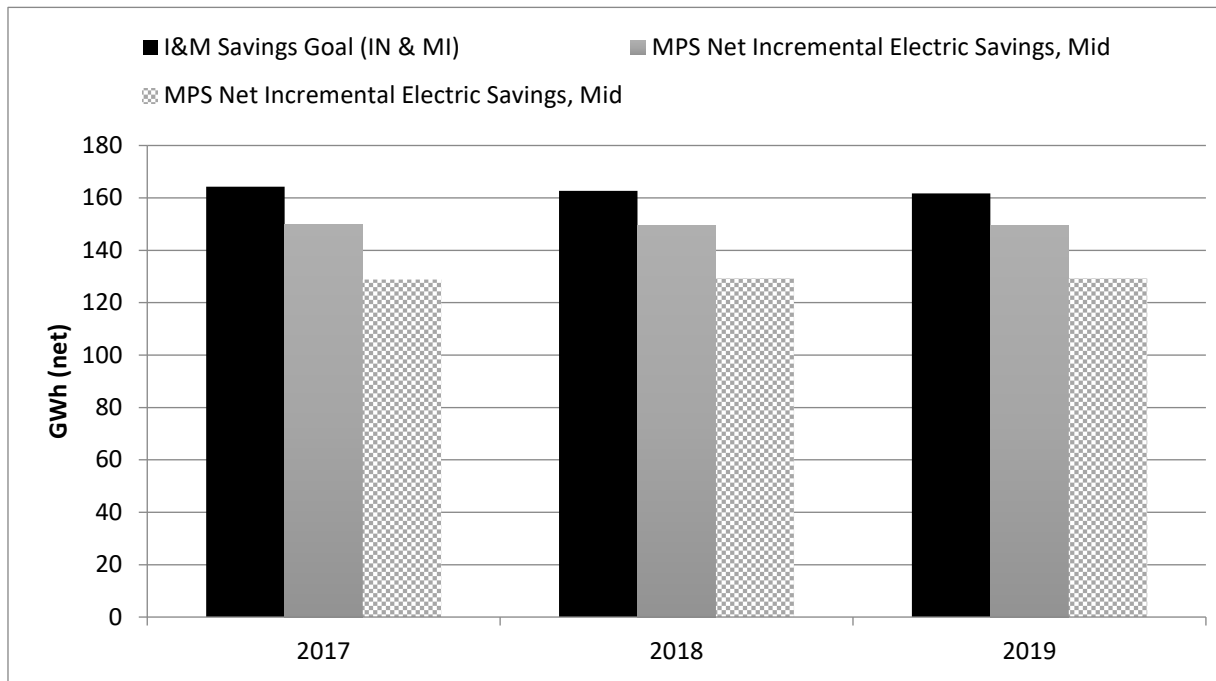
I&M 2017 and 2018 Scorecard

IURC Order in Cause No. 44841, p. 20; adjusted for 87% NTG in Walter Exhibit dated 8_26_2016 in DS

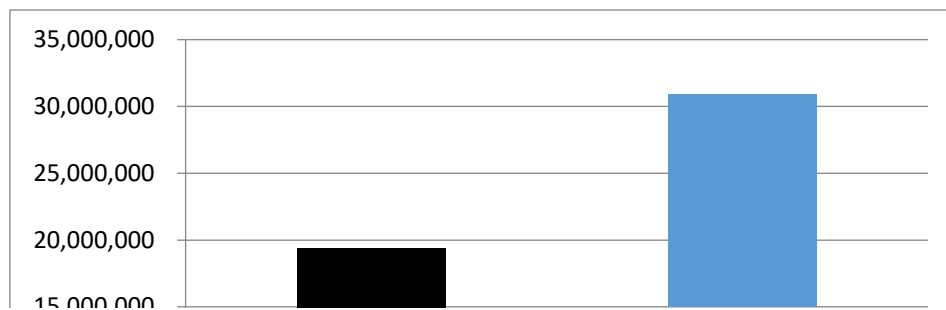
AEG IN Report - Table 7-11, pdf p. 64; AEG MI Report - Table 6-11, pdf pg. 56

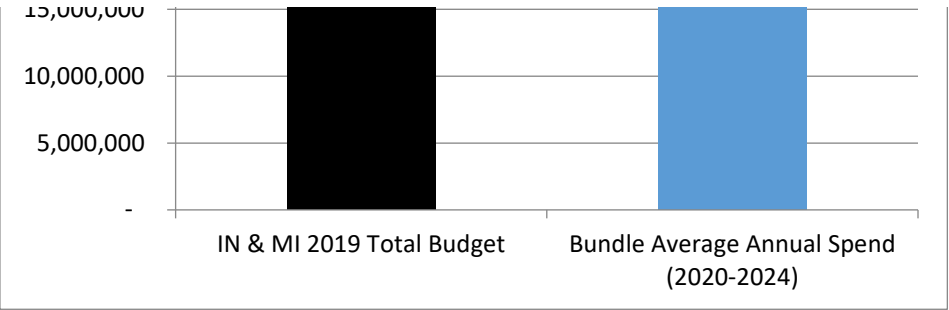
Slide 34 of May study

Slide 18 of December Inputs



slides





45285--CAC Exhibit 2--Public Workpaper 2 (Feb. 4, 2020)

MI case; MI Case No. U-18263, VVO not considered EE in IN so I subtracted that from MI

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Parent Name	Collection	Child Name	Category	Datetime
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2019
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2020
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2021
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2022
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2023
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2024
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2025
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2026
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2027
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2028
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2029
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2030
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2031
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2032
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2033
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2034
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2035
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2036
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2037
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2038
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2039
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2040
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2041
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2042
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2043
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2044
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2045
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2046
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2047
AEP_EAST	Physical Contract	MLOSSIM	Individual Purchases	2048
AEP_EAST	Physical Contract	OVECIM	Individual Purchases	2019
AEP_EAST	Physical Contract	OVECIM	Individual Purchases	2020
AEP_EAST	Physical Contract	OVECIM	Individual Purchases	2021
AEP_EAST	Physical Contract	OVECIM	Individual Purchases	2022
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AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2023
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AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2028
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2029
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2030
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2031
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2032
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2033
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AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2036
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2037
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2038
AEP_EAST	Physical Contract	IM_KITSELMAN_SOL	Renewable Purchases	2039
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40.99925684	0	1919.392636
40.68693272	0	1923.025943
40.48349807	0	1960.711792

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0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
238.0457673	16444.2238	6559.944108
238.8381428	16877.99982	6647.775217
238.0457673	17109.90762	6712.450129
238.0457673	17572.12813	6932.672826
238.0457673	17921.93222	7205.505331
238.8381428	18373.3541	7566.375151
238.0457673	18903.28658	7796.948082
238.0457673	19189.96545	8046.899558
238.0457673	19553.63773	8354.268374
238.8381428	20169.66801	10474.12725
27.49087581	2479.4437	1323.450083
0	0	0
0	0	0
0	0	0
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0	0	0
0	0	0
0	0	0
0	0	0
134.9337385	12823.84722	3749.593758
135.3727673	12941.68407	3752.304055
134.9337385	13031.58966	3797.219582
134.9337385	13438.33829	3917.102271
134.9337385	13772.16145	4105.840396
135.3727673	14250.57269	4318.235539
134.9337385	14624.95022	4412.409454
134.9337385	14583.98606	4533.917908

4728.479738

5875.979192

5718.14622

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[illegible]

Contract GWh	Generation Cost	Generation Revenue
--------------	-----------------	--------------------

1,966	77,011	54,905
1,941	78,815	54,826
1,965	80,057	56,161
2,109	82,049	62,668
2,150	83,881	66,687
2,154	86,180	69,822
2,148	88,090	71,725
2,148	89,563	74,113
2,147	91,491	76,937
2,152	94,257	95,929
1,932	77,306	86,983
1,775	60,982	81,347
1,776	62,354	82,541
1,781	63,990	85,053
1,467	43,312	71,460
1,422	41,165	71,217
773	0	41,303
766	0	41,081
751	0	41,338
752	0	42,824
752	0	43,893
754	0	44,681
754	0	45,208
754	0	46,325
755	0	46,938
756	0	48,687
756	0	49,443
720	0	48,358
605	0	41,520
607	0	42,624

Updated: 6/05/2019

Solution: 2018-48

Dataset: IM_IRP_0

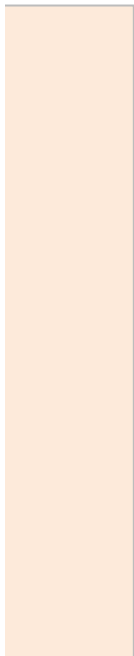
Output: Financial/C

9

IM IRP Base 053119

053119_RP1 Ret RP2 Ret Case5.xml

Companies/IM/Physical Contracts/ Individual + Renewable ONLY



Energy Efficiency Selected in the IRP

Year	Firm Capacity (MW)			Energy (GWh)		
	Commercial & Industrial	Residential	Total	Commercial & Industrial	Residential	Total
2020	19	0	19	76	0	76
2021	37	0	37	151	0	151
2022	54	0	54	218	0	218

Notes: 2018-19 I&M IRP Preferred Plan - Base Band Pricing

Energy Efficiency Selected in the IRP		
	Firm Capacity (MW)	Energy (GWh)
Year	Total	Total
2020	19	76
2021	37	151
2022	54	218

Notes: 2018-19 I&M IRP Preferred Plan - Base Band Pricing

	Utility Cost Tier 1 (\$/Watt)	Utility Cost Tier 2 (\$/Watt)	Utility Cost Tier 1 (\$/kW)	Utility Cost Tier 2 (\$/kW)
2016	\$1.68	\$1.68	\$1,683.69	\$1,683.69
2017	\$1.41	\$1.44	\$1,411.14	\$1,442.42
2018	\$1.48	\$1.48	\$1,479.88	\$1,479.88
2019	\$1.27	\$1.41	\$1,272.19	\$1,413.54
2020	\$1.23	\$1.37	\$1,234.21	\$1,371.35
2021	\$1.18	\$1.32	\$1,184.66	\$1,316.29
2022	\$1.08	\$1.20	\$1,081.61	\$1,201.79
2023	\$1.06	\$1.17	\$1,057.16	\$1,174.63
2024	\$1.15	\$1.28	\$1,150.43	\$1,278.25
2025	\$1.12	\$1.24	\$1,119.91	\$1,244.35
2026	\$1.13	\$1.25	\$1,125.61	\$1,250.68
2027	\$1.09	\$1.21	\$1,092.71	\$1,214.12
2028	\$1.10	\$1.22	\$1,097.53	\$1,219.48
2029	\$1.08	\$1.20	\$1,075.64	\$1,195.15
2030	\$1.05	\$1.17	\$1,052.38	\$1,169.31
2031	\$1.12	\$1.25	\$1,123.17	\$1,247.97
2032	\$1.15	\$1.27	\$1,145.64	\$1,272.93
2033	\$1.17	\$1.30	\$1,168.55	\$1,298.39
2034	\$1.19	\$1.32	\$1,190.75	\$1,323.06
2035	\$1.21	\$1.35	\$1,213.37	\$1,348.19
2036	\$1.24	\$1.38	\$1,237.64	\$1,375.16
2037	\$1.26	\$1.40	\$1,262.39	\$1,402.66
2038	\$1.29	\$1.43	\$1,287.64	\$1,430.71
2039	\$1.31	\$1.46	\$1,312.11	\$1,457.90
2040	\$1.34	\$1.49	\$1,337.04	\$1,485.60
2041	\$1.36	\$1.51	\$1,362.44	\$1,513.82
2042	\$1.39	\$1.54	\$1,388.33	\$1,542.59
2043	\$1.41	\$1.57	\$1,414.71	\$1,571.90
2044	\$1.44	\$1.60	\$1,440.17	\$1,600.19
2045	\$1.47	\$1.63	\$1,466.09	\$1,628.99
2046	\$1.49	\$1.66	\$1,492.48	\$1,658.32
2047	\$1.52	\$1.69	\$1,519.35	\$1,688.16
2048	\$1.52	\$1.69	\$1,519.35	\$1,688.16

Tier 1 % Change	Tier 2 % Change
-16.19%	-14.33%
4.87%	2.60%
-14.03%	-4.48%
-2.99%	-2.99%
-4.01%	-4.01%
-8.70%	-8.70%
-2.26%	-2.26%
8.82%	8.82%
-2.65%	-2.65%
0.51%	0.51%
-2.92%	-2.92%
0.44%	0.44%
-1.99%	-1.99%
-2.16%	-2.16%
6.73%	6.73%
2.00%	2.00%
2.00%	2.00%
1.90%	1.90%
1.90%	1.90%
2.00%	2.00%
2.00%	2.00%
2.00%	2.00%
1.90%	1.90%
1.90%	1.90%
1.90%	1.90%
1.90%	1.90%
1.90%	1.90%
1.80%	1.80%
1.80%	1.80%
1.80%	1.80%
1.80%	1.80%
0.00%	0.00%

r labeled as Confidential Workpaper 3) (Feb. 4, 2020)

	6	6	6	6	6	
	2020	2021	2022	2023	2024	Total
2020	6					6
2021	5.346	6				11.346
2022	4.59	5.346	6			15.936
2023	3.774	4.59	5.346	6		19.71
2024	2.934	3.774	4.59	5.346	6	22.644
2025	2.124	2.934	3.774	4.59	5.346	18.768
2026	1.386	2.124	2.934	3.774	4.59	14.808
2027	0.774	1.386	2.124	2.934	3.774	10.992
2028	0.33	0.774	1.386	2.124	2.934	7.548
2029	0.078	0.33	0.774	1.386	2.124	4.692
2030	0	0.078	0.33	0.774	1.386	2.568
2031	0	0	0.078	0.33	0.774	1.182
2032	0	0	0	0.078	0.33	0.408
2033	0	0	0	0	0.078	0.078
Total						136.68

	6	7	8	10	13	
	2020	2021	2022	2023	2024	Total
2020	6					6
2021	5.346	6.237				11.583
2022	4.59	5.355	6.12			16.065
2023	3.774	4.403	5.032	6.29		19.499
2024	2.934	3.423	3.912	4.89	6.357	21.516
2025	2.124	2.478	2.832	3.54	4.602	15.576
2026	1.386	1.617	1.848	2.31	3.003	10.164
2027	0.774	0.903	1.032	1.29	1.677	5.676
2028	0.33	0.385	0.44	0.55	0.715	2.42
2029	0.078	0.091	0.104	0.13	0.169	0.572
2030						
2031						
2032						
2033						
Total						109.071

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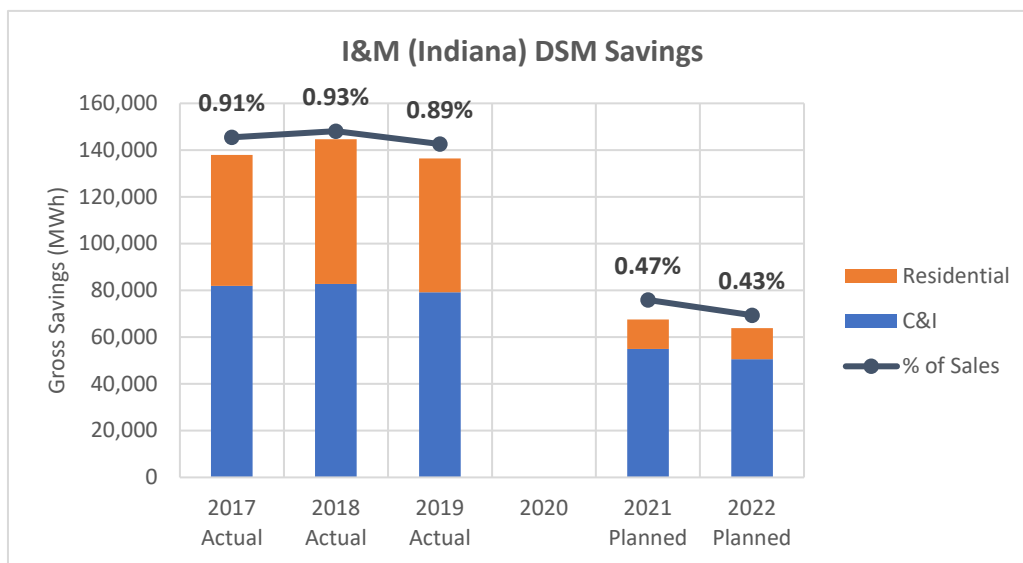
Plexos Generation
6
11.583
16.065
19.499
21.516
15.576
10.164
5.676
2.42
0.572
109.071

1
0.891
0.765
0.629
0.489
0.354
0.231
0.129
0.055
0.013
0

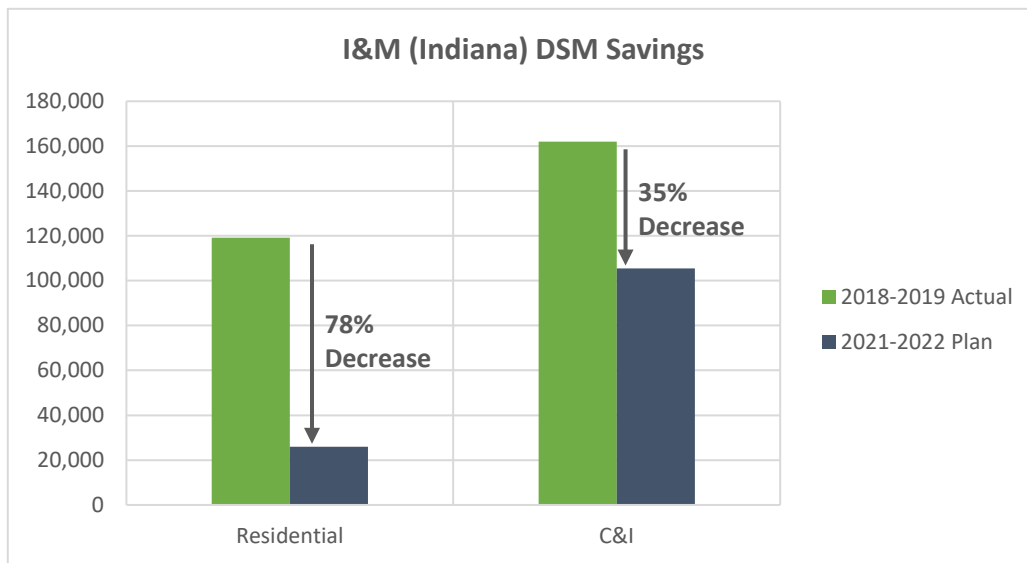
45285-- CAC Exhibit 3-- Workpaper 1

Sources: 2017-2019 actuals from I&M Scorecards
2021-2022 plan values from Walter workpapers (Attach JCW-2S Plan Summary Pg
Sales from Walter workpapers (IM IN & MI Sales & Revenue)

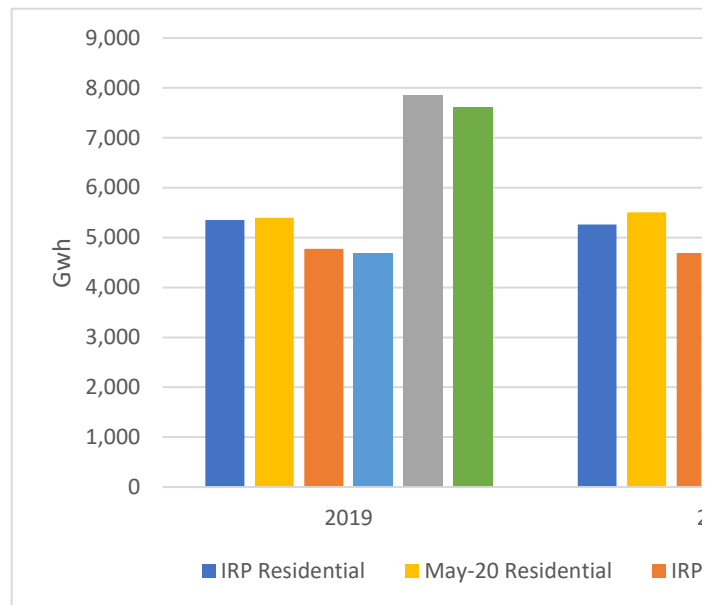
Row Labels	C&I	Residential	Grand Total	Sales (MWh)	% of Sales
2017 Actual	81,863	56,074	137,937	15,166,074	0.91%
2018 Actual	82,795	61,876	144,671	15,629,129	0.93%
2019 Actual	79,174	57,263	136,437	15,313,296	0.89%
2020					
2021 Planned	54,942	12,613	67,555	14,241,576	0.47%
2022 Planned	50,504	13,369	63,873	14,728,925	0.43%
Grand Total	378,946	239,581	618,528		



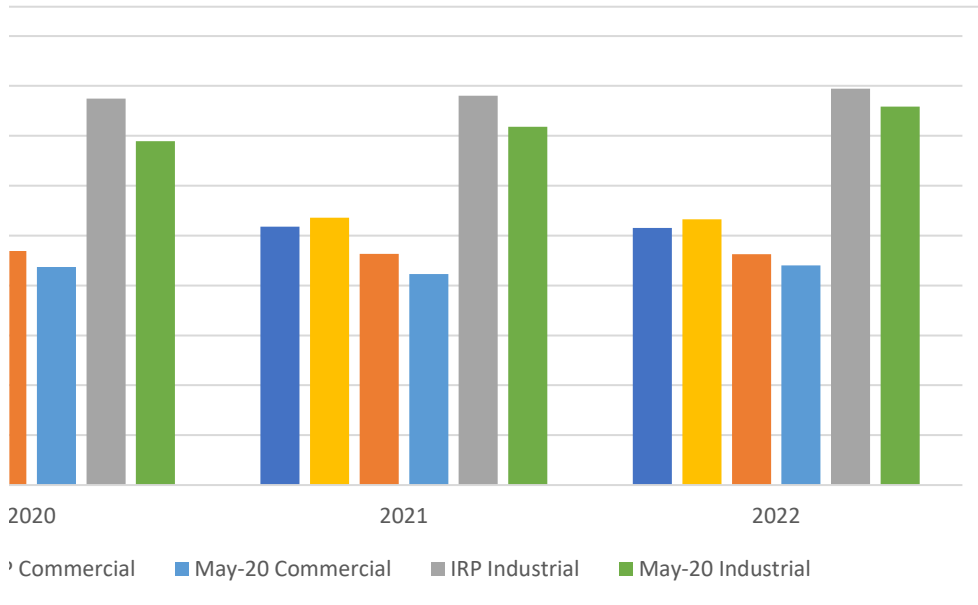
	2018-2019 Actual	2021-2022 Plan	% Change
Residential	119,139	25,982	-78%
C&I	161,969	105,446	-35%



	IRP			May-20		
	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2019	5,351	4,776	7,847	5,398	4,695	7,621
2020	5,261	4,691	7,748	5,509	4,369	6,895
2021	5,177	4,631	7,806	5,358	4,227	7,182
2022	5,157	4,629	7,945	5,330	4,402	7,587
2023	5,163	4,642	7,937	5,296	4,529	7,549
2024	5,189	4,667	7,894	5,263	4,548	7,627
2025	5,222	4,672	7,918	5,227	4,530	7,629
2026	5,220	4,651	7,935	5,205	4,540	7,644
2027	5,214	4,633	7,939	5,187	4,517	7,652
2028	5,211	4,621	7,992	5,177	4,503	7,703
2029	5,219	4,612	8,050	5,167	4,498	7,757
2030	5,223	4,589	8,088	5,168	4,504	7,798



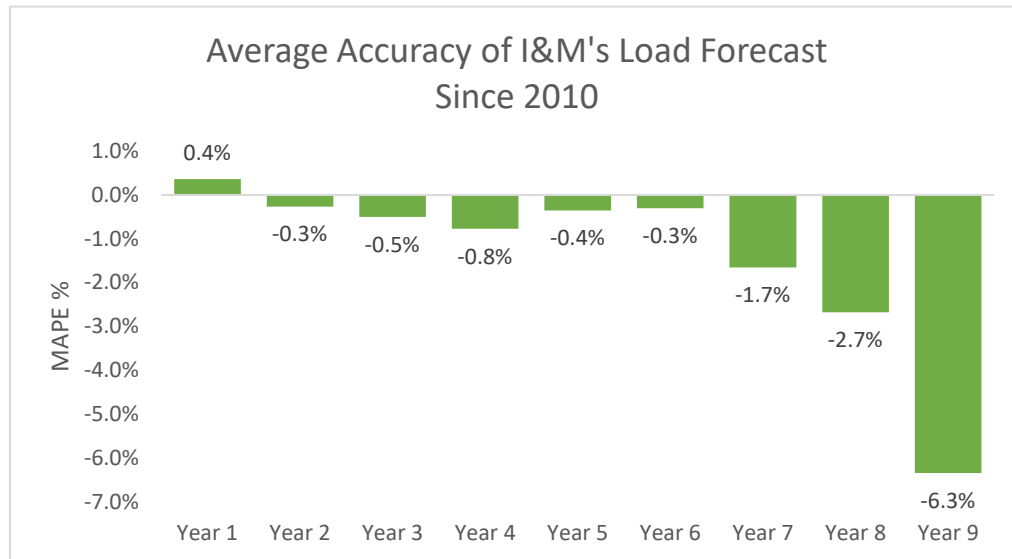
Change			Change		
Residential	Commercial	Industrial	Residential	Commercial	Industrial
1%	-2%	-3%	47	-81	-226
5%	-7%	-11%	248	-322	-853
3%	-9%	-8%	181	-404	-624
3%	-5%	-5%	173	-227	-358
3%	-2%	-5%	133	-113	-388
1%	-3%	-3%	74	-119	-267
0%	-3%	-4%	5	-142	-289
0%	-2%	-4%	-15	-111	-291
-1%	-3%	-4%	-27	-116	-287
-1%	-3%	-4%	-34	-118	-289
-1%	-2%	-4%	-52	-114	-293
-1%	-2%	-4%	-55	-85	-290

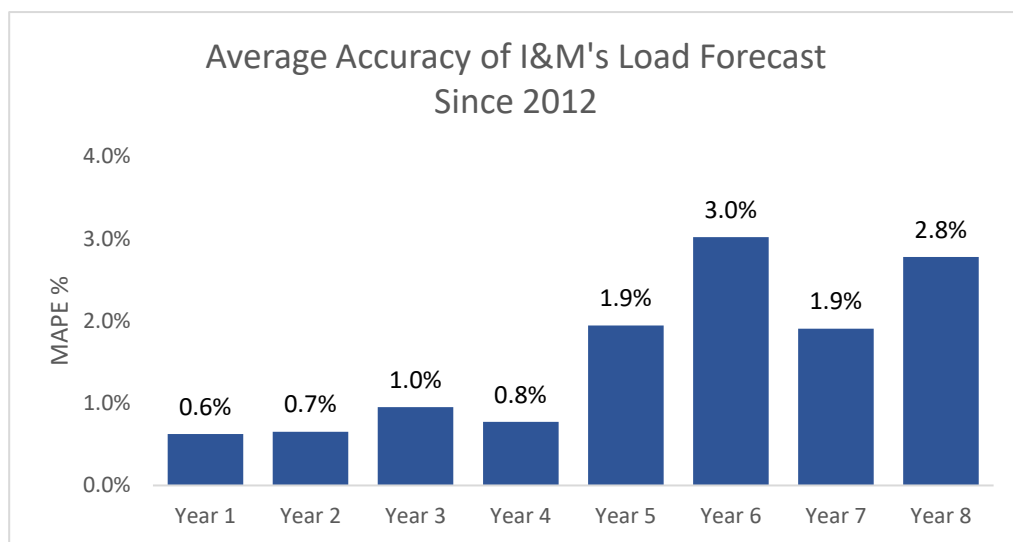


45285-- CAC Exhibit 4-- Workpaper 3

from MPSC SC 5-1 WP CMB Rebuttal

45285-- CAC Exhibit 4-- Workpaper 5





	nkwh	kwh09	kwh10
YEAR	nkwh		
2005	19,116,134,536		
2006	19,178,421,730		
2007	19,272,031,988		
2008	18,804,044,270		
2009	17,993,717,122	19,277,984,738	
2010	18,410,765,040	19,611,041,563	18,511,875,245
2011	18,432,885,360	19,886,141,183	19,106,771,780
2012	18,392,393,134	20,002,145,663	19,286,457,027
2013	18,346,153,805	20,127,993,250	19,458,837,528
2014	18,469,172,080	20,263,678,186	19,596,941,174
2015	18,161,125,332	20,397,473,072	19,738,566,683
2016	18,300,418,421	20,531,331,443	19,884,567,982
2017	18,163,728,475	20,655,145,943	20,020,875,215
2018	18,183,710,039	20,783,809,855	20,159,407,308
2019	17,783,267,862	20,918,532,509	20,297,297,271
2020		21,060,778,999	20,435,175,672

	kwh09	kwh10
2005		
2006		
2007		
2008		
2009	-6.7%	
2010	-6.1%	-0.5%
2011	-7.3%	-3.5%
2012	-8.0%	-4.6%
2013	-8.9%	-5.7%
2014	-8.9%	-5.8%
2015	-11.0%	-8.0%
2016	-10.9%	-8.0%
2017	-12.1%	-9.3%
2018	-12.5%	-9.8%
2019	-15.0%	-12.4%
2020		

Year 1	-6.7%	-0.5%
Year 2	-6.1%	-3.5%
Year 3	-7.3%	-4.6%
Year 4	-8.0%	-5.7%
Year 5	-8.9%	-5.8%
Year 6	-8.9%	-8.0%
Year 7	-11.0%	-8.0%
Year 8	-10.9%	-9.3%
Year 9	-12.1%	-9.8%

kwh11	kwh12	kwh13	kwh14
18,580,045,873			
19,048,836,120	18,411,388,920		
19,324,195,205	18,446,069,802	18,213,034,403	
19,148,802,369	18,283,979,395	18,262,747,596	17,728,395,812
18,944,037,643	18,008,391,807	18,292,335,434	17,611,138,797
18,781,333,526	17,791,672,472	18,185,223,268	17,457,238,399
18,622,574,565	17,578,422,431	18,011,448,989	17,297,744,803
18,463,762,461	17,418,754,731	17,922,726,262	17,150,310,246
18,310,983,338	17,302,467,027	17,885,946,919	17,054,445,125
18,222,729,551	17,281,263,149	17,883,220,461	16,986,561,728

kwh11	kwh12	kwh13	kwh14
-0.8%			
-3.4%	-0.1%		
-5.1%	-0.5%	0.7%	
-3.5%	1.0%	1.1%	4.2%
-4.1%	0.8%	-0.7%	3.1%
-2.6%	2.9%	0.6%	4.8%
-2.5%	3.3%	0.8%	5.0%
-1.5%	4.4%	1.5%	6.0%
-2.9%	2.8%	-0.6%	4.3%
-0.8%	-0.1%	0.7%	4.2%
-3.4%	-0.5%	1.1%	3.1%
-5.1%	1.0%	-0.7%	4.8%
-3.5%	0.8%	0.6%	5.0%
-4.1%	2.9%	0.8%	6.0%
-2.6%	3.3%	1.5%	4.3%
-2.5%	4.4%	-0.6%	
-1.5%	2.8%		
-2.9%			

kwh15	kwh16	kwh17	kwh18
18,422,314,777			
18,341,302,617	17,974,052,049		
18,239,547,659	17,985,188,012	17,885,619,046	
18,173,740,104	17,954,527,973	17,871,882,353	18,169,332,174
18,135,904,147	18,273,444,186	17,831,049,749	18,080,698,210
18,137,617,223	18,250,142,812	17,799,194,827	18,125,843,940

kwh15	kwh16	kwh17	kwh18
-1.4%			
-0.2%	1.8%		
-0.4%	1.0%	1.6%	
0.1%	1.3%	1.7%	0.1%
-1.9%	-2.7%	-0.3%	-1.6%
-1.4%	1.8%	1.6%	0.1%
-0.2%	1.0%	1.7%	-1.6%
-0.4%	1.3%	-0.3%	
0.1%	-2.7%		
-1.9%			

kwh19

18,117,967,826
17,865,692,100

kwh19

-1.8%

	2010	2009	2012-forward
-1.8%	0.4%	-0.3%	0.6%
	-0.3%	-0.9%	0.7%
	-0.5%	-1.3%	1.0%
	-0.8%	-1.7%	0.8%
	-0.4%	-1.6%	1.9%
	-0.3%	-1.7%	3.0%
	-1.7%	-3.5%	1.9%
	-2.7%	-4.7%	2.8%
	-6.3%	-8.2%	#DIV/0!

LCD				
Technical Life	<2025	<30	<40	<=2045
10	1,000	1,000	1,000	1,000
15	1,000	1,000	1,000	1,000

Cost Escalation Rate	2%
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45285--Joint Exhibit 4_Part 2--CAC-I&M Stipulation of I&M Witness Burnett

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh)	Yearly Potential Savings (MWh)	Yearly Potential Savings (MWh) 2030-	Yearly Potential Savings (MWh)	Bundle Life	Modeling Degradation	Shape used
		2020-2024	2025-2029	2039	2040-2045			
C - VFD - AP	\$0.06	5,411	5,748	6,484	6,629	14	15	Com Cool
C - VFD - HAP	\$0.09	2,599	2,444	2,150	2,200	14	15	Com Cool
C - INDUSTRIAL MEASURES - AP	\$0.11	6,417	5,688	4,636	4,361	10	10	Com Other
C - INDUSTRIAL MEASURES - HAP	\$0.16	2,624	2,003	1,190	999	10	10	Com Other
C - HVAC & REFRIGERATION - AP	\$0.10	10,216	9,875	9,757	9,625	17	15	total com
C - HVAC & REFRIGERATION - HAP	\$0.15	3,921	3,407	2,278	1,970	17	15	total com
C - COMMERCIAL OUTDOOR LIGHTING - AP	\$0.10	3,093	3,463	2,688	2,347	14	15	Com Other
C - COMMERCIAL OUTDOOR LIGHTING - HAP	\$0.15	1,109	1,388	906	738	14	15	Com Other
C - COMMERCIAL INDOOR LIGHTING - AP	\$0.10	20,482	22,707	19,885	17,912	13	15	Com Other
C - COMMERCIAL INDOOR LIGHTING - HAP	\$0.15	5,707	6,936	4,674	3,591	13	15	Com Other
C - BUILDING MANAGEMENT SYSTEM - AP	\$0.19	4,036	4,253	4,606	4,735	10	10	Com Other
C - BUILDING MANAGEMENT SYSTEM - HAP	\$0.29	1,770	1,608	1,380	1,325	10	10	Com Other
C - COM MISCELLANEOUS - AP	\$0.10	12,149	16,004	14,315	16,295	16	15	Com Other
C - COM MISCELLANEOUS - HAP	\$0.15	3,799	3,252	4,040	4,896	16	15	Com Other
C - IND MISCELLANEOUS - AP	\$0.11	1,788	2,355	2,107	2,398	10	10	Com Other
C - IND MISCELLANEOUS - HAP	\$0.16	602	515	640	776	10	10	

NOTE: The Yearly Potential Savings numbers in the above table are incremental. They represent the amount of energy savings available if all of the energy from the previous

Max Capacities from Shape file

	20-24	25-29	30-40	41-45
C - VFD - AP	0.6566029	0.6611047	0.66118508	0.6624963
C - VFD - HAP	0.6566029	0.6611047	0.66118508	0.6624963
C - INDUSTRIAL MEASURES - AP	0.1765809	0.176948	0.17679876	0.1767859
C - INDUSTRIAL MEASURES - HAP	0.1765809	0.176948	0.17679876	0.1767859
C - HVAC & REFRIGERATION - AP	0.1909053	0.1933792	0.19327875	0.1935286
C - HVAC & REFRIGERATION - HAP	0.1909053	0.1933792	0.19327875	0.1935286
C - COMMERCIAL OUTDOOR LIGHTING - AP	0.1765809	0.176948	0.17679876	0.1767859
C - COMMERCIAL OUTDOOR LIGHTING - HAP	0.1765809	0.176948	0.17679876	0.1767859
C - COMMERCIAL INDOOR LIGHTING - AP	0.1765809	0.176948	0.17679876	0.1767859
C - COMMERCIAL INDOOR LIGHTING - HAP	0.1765809	0.176948	0.17679876	0.1767859
C - BUILDING MANAGEMENT SYSTEM - AP	0.1765809	0.176948	0.17679876	0.1767859
C - BUILDING MANAGEMENT SYSTEM - HAP	0.1765809	0.176948	0.17679876	0.1767859
C - COM MISCELLANEOUS - AP	0.1765809	0.176948	0.17679876	0.1767859
C - COM MISCELLANEOUS - HAP	0.1765809	0.176948	0.17679876	0.1767859
C - IND MISCELLANEOUS - AP	0.1765809	0.176948	0.17679876	0.1767859
C - IND MISCELLANEOUS - HAP	0.1765809	0.176948	0.17679876	0.1767859

Degradation Percentage

Year	10-Year	15-Year
1	100.00%	100.00%
2	89.10%	92.90%
3	76.50%	85.00%
4	62.90%	76.50%
5	48.90%	67.50%
6	35.40%	58.20%
7	23.10%	48.90%
8	12.90%	39.80%
9	5.50%	31.10%
10	1.30%	23.10%
11	0%	16.00%
12	0%	10.10%
13	0%	5.50%
14	0%	2.30%
15	0%	0.50%

2018 APCO

DSM Modelir

Bundle Name: COM MISCELLANEOUS - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.10	100,263	0	0	0
2021	0.10	95,007	0	0	0
2022	0.10	88,667	0	0	0
2023	0.11	81,396	0	0	0
2024	0.11	73,256	0	0	0
2025	0.11	64,427	110,699	0	0
2026	0.11	55,214	104,896	0	0
2027	0.12	45,838	97,895	0	0
2028	0.12	36,534	89,868	0	0
2029	0.12	27,679	80,881	0	0
2030	0.12	19,555	71,132	122,220	0
2031	0.12	12,591	60,961	115,813	0
2032	0.13	6,994	50,609	108,084	0
2033	0.13	2,983	40,337	99,221	0
2034	0.13	661	30,560	89,299	0
2035	0.13	0	21,591	78,536	0
2036	0.14	0	13,902	67,306	0
2037	0.14	0	7,722	55,876	0
2038	0.14	0	3,294	44,535	0
2039	0.15	0	730	33,741	0
2040	0.15	0	0	23,838	148,986
2041	0.15	0	0	15,348	141,176
2042	0.16	0	0	8,525	131,754
2043	0.16	0	0	3,636	120,950
2044	0.16	0	0	806	108,855
2045	0.16	0	0	0	95,734
2046	0.17	0	0	0	82,045
2047	0.17	0	0	0	68,113
2048	0.17	0	0	0	54,288

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

0.10

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	12,149
2025-2029 Bundle Energy Reduction (MWh) =	16,004
2030-2040 Bundle Energy Reduction (MWh) =	14,315
2041-2045 Bundle Energy Reduction (MWh) =	16,295

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

IRP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
568	0	0	0	12	0	0	0
538	0	0	0	13	0	0	0
502	0	0	0	14	0	0	0
461	0	0	0	16	0	0	0
415	0	0	0	18	0	0	0
0	626	0	0	0	16	0	0
0	593	0	0	0	17	0	0
0	553	0	0	0	19	0	0
0	508	0	0	0	21	0	0
0	457	0	0	0	24	0	0
0	0	691	0	0	0	14	0
0	0	655	0	0	0	15	0
0	0	611	0	0	0	17	0
0	0	561	0	0	0	19	0
0	0	505	0	0	0	21	0
0	0	444	0	0	0	25	0
0	0	381	0	0	0	29	0
0	0	316	0	0	0	36	0
0	0	252	0	0	0	46	0
0	0	191	0	0	0	62	0
0	0	0	843	0	0	0	16
0	0	0	799	0	0	0	18
0	0	0	745	0	0	0	19
0	0	0	684	0	0	0	21
0	0	0	616	0	0	0	24
0	0	0	542	0	0	0	28
0	0	0	464	0	0	0	33
0	0	0	385	0	0	0	41
0	0	0	307	0	0	0	52

2018 APCO

DSM Modelir

Bundle Name: COM MISCELLANEOUS - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.15	150,395	0	0	0
2021	0.15	142,511	0	0	0
2022	0.16	133,000	0	0	0
2023	0.16	122,094	0	0	0
2024	0.16	109,885	0	0	0
2025	0.17	96,640	166,048	0	0
2026	0.17	82,821	157,344	0	0
2027	0.17	68,757	146,843	0	0
2028	0.18	54,802	134,802	0	0
2029	0.18	41,519	121,321	0	0
2030	0.18	29,333	106,698	183,330	0
2031	0.19	18,887	91,441	173,720	0
2032	0.19	10,491	75,913	162,126	0
2033	0.19	4,475	60,505	148,832	0
2034	0.20	992	45,840	133,949	0
2035	0.20	0	32,386	117,803	0
2036	0.21	0	20,852	100,959	0
2037	0.21	0	11,582	83,814	0
2038	0.21	0	4,940	66,803	0
2039	0.22	0	1,095	50,611	0
2040	0.22	0	0	35,757	223,478
2041	0.23	0	0	23,023	211,764
2042	0.23	0	0	12,788	197,631
2043	0.24	0	0	5,455	181,425
2044	0.24	0	0	1,210	163,283
2045	0.25	0	0	0	143,602
2046	0.25	0	0	0	123,068
2047	0.26	0	0	0	102,169
2048	0.26	0	0	0	81,432

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

0.15

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	3,799
2025-2029 Bundle Energy Reduction (MWh) =	3,252
2030-2040 Bundle Energy Reduction (MWh) =	4,040
2041-2045 Bundle Energy Reduction (MWh) =	4,896

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
852	0	0	0	4	0	0	0
807	0	0	0	4	0	0	0
753	0	0	0	4	0	0	0
691	0	0	0	5	0	0	0
622	0	0	0	6	0	0	0
0	938	0	0	0	3	0	0
0	889	0	0	0	4	0	0
0	830	0	0	0	4	0	0
0	762	0	0	0	4	0	0
0	686	0	0	0	5	0	0
0	0	1,037	0	0	0	4	0
0	0	983	0	0	0	4	0
0	0	917	0	0	0	5	0
0	0	842	0	0	0	5	0
0	0	758	0	0	0	6	0
0	0	666	0	0	0	7	0
0	0	571	0	0	0	8	0
0	0	474	0	0	0	10	0
0	0	378	0	0	0	13	0
0	0	286	0	0	0	17	0
0	0	0	1,264	0	0	0	5
0	0	0	1,198	0	0	0	5
0	0	0	1,118	0	0	0	6
0	0	0	1,026	0	0	0	6
0	0	0	924	0	0	0	7
0	0	0	812	0	0	0	8
0	0	0	696	0	0	0	10
0	0	0	578	0	0	0	12
0	0	0	461	0	0	0	16

2018 APCO

DSM Modelir

Bundle Name: IND MISCELLANEOUS - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.11	106,472	0	0	0
2021	0.11	96,764	0	0	0
2022	0.11	84,742	0	0	0
2023	0.11	71,070	0	0	0
2024	0.12	56,357	0	0	0
2025	0.12	41,614	117,554	0	0
2026	0.12	27,698	106,836	0	0
2027	0.12	15,777	93,562	0	0
2028	0.12	6,861	78,467	0	0
2029	0.13	1,654	62,223	0	0
2030	0.13	0	45,945	129,789	0
2031	0.13	0	30,581	117,955	0
2032	0.14	0	17,419	103,300	0
2033	0.14	0	7,575	86,634	0
2034	0.14	0	1,826	68,699	0
2035	0.14	0	0	50,727	0
2036	0.15	0	0	33,764	0
2037	0.15	0	0	19,232	0
2038	0.15	0	0	8,364	0
2039	0.16	0	0	2,016	0
2040	0.16	0	0	0	158,212
2041	0.16	0	0	0	143,787
2042	0.16	0	0	0	125,922
2043	0.17	0	0	0	105,607
2044	0.17	0	0	0	83,743
2045	0.17	0	0	0	61,836
2046	0.18	0	0	0	41,158
2047	0.18	0	0	0	23,444
2048	0.19	0	0	0	10,195

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.11

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000	
2030-2040 Energy Reduction (MWh) (1) =	1,000	
2041-2045 Energy Reduction (MWh) (1) =	1,000	
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948	0.1769480
2030-2040 Maximum Reduction (MW) (2) =	0.1767988	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	1,788	6416.612
2025-2029 Bundle Energy Reduction (MWh) =	2,355	5687.752
2030-2040 Bundle Energy Reduction (MWh) =	2,107	4636.06
2041-2045 Bundle Energy Reduction (MWh) =	2,398	4360.57

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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1 Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
603	0	0	0	2	0	0	0
548	0	0	0	2	0	0	0
480	0	0	0	2	0	0	0
402	0	0	0	3	0	0	0
319	0	0	0	4	0	0	0
0	664	0	0	0	2	0	0
0	604	0	0	0	3	0	0
0	529	0	0	0	3	0	0
0	443	0	0	0	4	0	0
0	352	0	0	0	5	0	0
0	0	734	0	0	0	2	0
0	0	667	0	0	0	2	0
0	0	584	0	0	0	3	0
0	0	490	0	0	0	3	0
0	0	389	0	0	0	4	0
0	0	287	0	0	0	6	0
0	0	191	0	0	0	9	0
0	0	109	0	0	0	16	0
0	0	47	0	0	0	38	0
0	0	11	0	0	0	162	0
0	0	0	895	0	0	0	2
0	0	0	813	0	0	0	3
0	0	0	712	0	0	0	3
0	0	0	597	0	0	0	4
0	0	0	474	0	0	0	5
0	0	0	350	0	0	0	7
0	0	0	233	0	0	0	10
0	0	0	133	0	0	0	19
0	0	0	58	0	0	0	44

2018 APCO

DSM Modelir

Bundle Name: IND MISCELLANEOUS - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.16	159,709	0	0	0
2021	0.16	145,146	0	0	0
2022	0.17	127,113	0	0	0
2023	0.17	106,606	0	0	0
2024	0.17	84,535	0	0	0
2025	0.18	62,421	176,331	0	0
2026	0.18	41,547	160,253	0	0
2027	0.18	23,666	140,343	0	0
2028	0.19	10,292	117,701	0	0
2029	0.19	2,481	93,334	0	0
2030	0.19	0	68,918	194,684	0
2031	0.20	0	45,871	176,933	0
2032	0.20	0	26,129	154,950	0
2033	0.21	0	11,363	129,952	0
2034	0.21	0	2,740	103,048	0
2035	0.21	0	0	76,091	0
2036	0.22	0	0	50,646	0
2037	0.22	0	0	28,848	0
2038	0.23	0	0	12,546	0
2039	0.23	0	0	3,025	0
2040	0.24	0	0	0	237,319
2041	0.24	0	0	0	215,680
2042	0.25	0	0	0	188,883
2043	0.25	0	0	0	158,410
2044	0.26	0	0	0	125,615
2045	0.26	0	0	0	92,755
2046	0.27	0	0	0	61,737
2047	0.27	0	0	0	35,166
2048	0.28	0	0	0	15,293

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.16

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	602
2025-2029 Bundle Energy Reduction (MWh) =	515
2030-2040 Bundle Energy Reduction (MWh) =	640
2041-2045 Bundle Energy Reduction (MWh) =	776

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
904	0	0	0	1	0	0	0
822	0	0	0	1	0	0	0
720	0	0	0	1	0	0	0
604	0	0	0	1	0	0	0
479	0	0	0	1	0	0	0
0	997	0	0	0	1	0	0
0	906	0	0	0	1	0	0
0	793	0	0	0	1	0	0
0	665	0	0	0	1	0	0
0	527	0	0	0	1	0	0
0	0	1,101	0	0	0	1	0
0	0	1,001	0	0	0	1	0
0	0	876	0	0	0	1	0
0	0	735	0	0	0	1	0
0	0	583	0	0	0	1	0
0	0	430	0	0	0	2	0
0	0	286	0	0	0	3	0
0	0	163	0	0	0	5	0
0	0	71	0	0	0	12	0
0	0	17	0	0	0	49	0
0	0	0	1,342	0	0	0	1
0	0	0	1,220	0	0	0	1
0	0	0	1,068	0	0	0	1
0	0	0	896	0	0	0	1
0	0	0	711	0	0	0	2
0	0	0	525	0	0	0	2
0	0	0	349	0	0	0	3
0	0	0	199	0	0	0	6
0	0	0	87	0	0	0	14

2018 APCO

DSM Modelir

Bundle Name: INDUSTRIAL MEASURES - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.11	106,472	0	0	0
2021	0.11	96,764	0	0	0
2022	0.11	84,742	0	0	0
2023	0.11	71,070	0	0	0
2024	0.12	56,357	0	0	0
2025	0.12	41,614	117,554	0	0
2026	0.12	27,698	106,836	0	0
2027	0.12	15,777	93,562	0	0
2028	0.12	6,861	78,467	0	0
2029	0.13	1,654	62,223	0	0
2030	0.13	0	45,945	129,789	0
2031	0.13	0	30,581	117,955	0
2032	0.14	0	17,419	103,300	0
2033	0.14	0	7,575	86,634	0
2034	0.14	0	1,826	68,699	0
2035	0.14	0	0	50,727	0
2036	0.15	0	0	33,764	0
2037	0.15	0	0	19,232	0
2038	0.15	0	0	8,364	0
2039	0.16	0	0	2,016	0
2040	0.16	0	0	0	158,212
2041	0.16	0	0	0	143,787
2042	0.16	0	0	0	125,922
2043	0.17	0	0	0	105,607
2044	0.17	0	0	0	83,743
2045	0.17	0	0	0	61,836
2046	0.18	0	0	0	41,158
2047	0.18	0	0	0	23,444
2048	0.19	0	0	0	10,195

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.11

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	6,417
2025-2029 Bundle Energy Reduction (MWh) =	5,688
2030-2040 Bundle Energy Reduction (MWh) =	4,636
2041-2045 Bundle Energy Reduction (MWh) =	4,361

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

IRP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
603	0	0	0	6	0	0	0
548	0	0	0	7	0	0	0
480	0	0	0	8	0	0	0
402	0	0	0	10	0	0	0
319	0	0	0	13	0	0	0
0	664	0	0	0	6	0	0
0	604	0	0	0	6	0	0
0	529	0	0	0	7	0	0
0	443	0	0	0	9	0	0
0	352	0	0	0	12	0	0
0	0	734	0	0	0	5	0
0	0	667	0	0	0	5	0
0	0	584	0	0	0	6	0
0	0	490	0	0	0	7	0
0	0	389	0	0	0	9	0
0	0	287	0	0	0	13	0
0	0	191	0	0	0	20	0
0	0	109	0	0	0	36	0
0	0	47	0	0	0	84	0
0	0	11	0	0	0	357	0
0	0	0	895	0	0	0	4
0	0	0	813	0	0	0	5
0	0	0	712	0	0	0	6
0	0	0	597	0	0	0	7
0	0	0	474	0	0	0	9
0	0	0	350	0	0	0	12
0	0	0	233	0	0	0	19
0	0	0	133	0	0	0	34
0	0	0	58	0	0	0	79

I&M_C_API&M_C_API&M_C_API&M_C_API&M_C_H&I&M_C_H&I&M_C_H&I&M_C_HAP_Ind_46

2018 APCO

DSM Modelir

Bundle Name: INDUSTRIAL MEASURES - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.16	159,709	0	0	0
2021	0.16	145,146	0	0	0
2022	0.17	127,113	0	0	0
2023	0.17	106,606	0	0	0
2024	0.17	84,535	0	0	0
2025	0.18	62,421	176,331	0	0
2026	0.18	41,547	160,253	0	0
2027	0.18	23,666	140,343	0	0
2028	0.19	10,292	117,701	0	0
2029	0.19	2,481	93,334	0	0
2030	0.19	0	68,918	194,684	0
2031	0.20	0	45,871	176,933	0
2032	0.20	0	26,129	154,950	0
2033	0.21	0	11,363	129,952	0
2034	0.21	0	2,740	103,048	0
2035	0.21	0	0	76,091	0
2036	0.22	0	0	50,646	0
2037	0.22	0	0	28,848	0
2038	0.23	0	0	12,546	0
2039	0.23	0	0	3,025	0
2040	0.24	0	0	0	237,319
2041	0.24	0	0	0	215,680
2042	0.25	0	0	0	188,883
2043	0.25	0	0	0	158,410
2044	0.26	0	0	0	125,615
2045	0.26	0	0	0	92,755
2046	0.27	0	0	0	61,737
2047	0.27	0	0	0	35,166
2048	0.28	0	0	0	15,293

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.16

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	2,624
2025-2029 Bundle Energy Reduction (MWh) =	2,003
2030-2040 Bundle Energy Reduction (MWh) =	1,190
2041-2045 Bundle Energy Reduction (MWh) =	999

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

IRP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
904	0	0	0	3	0	0	0
822	0	0	0	3	0	0	0
720	0	0	0	3	0	0	0
604	0	0	0	4	0	0	0
479	0	0	0	5	0	0	0
0	997	0	0	0	2	0	0
0	906	0	0	0	2	0	0
0	793	0	0	0	3	0	0
0	665	0	0	0	3	0	0
0	527	0	0	0	4	0	0
0	0	1,101	0	0	0	1	0
0	0	1,001	0	0	0	1	0
0	0	876	0	0	0	2	0
0	0	735	0	0	0	2	0
0	0	583	0	0	0	2	0
0	0	430	0	0	0	3	0
0	0	286	0	0	0	5	0
0	0	163	0	0	0	9	0
0	0	71	0	0	0	22	0
0	0	17	0	0	0	92	0
0	0	0	1,342	0	0	0	1
0	0	0	1,220	0	0	0	1
0	0	0	1,068	0	0	0	1
0	0	0	896	0	0	0	2
0	0	0	711	0	0	0	2
0	0	0	525	0	0	0	3
0	0	0	349	0	0	0	4
0	0	0	199	0	0	0	8
0	0	0	87	0	0	0	18

Bundle Name: C - VFD - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.06	58,202	0	0	0
2021	0.06	55,151	0	0	0
2022	0.06	51,470	0	0	0
2023	0.06	47,250	0	0	0
2024	0.06	42,525	0	0	0
2025	0.06	37,399	64,260	0	0
2026	0.07	32,052	60,891	0	0
2027	0.07	26,609	56,828	0	0
2028	0.07	21,208	52,168	0	0
2029	0.07	16,068	46,951	0	0
2030	0.07	11,352	41,292	70,948	0
2031	0.07	7,309	35,387	67,229	0
2032	0.07	4,060	29,378	62,742	0
2033	0.08	1,732	23,415	57,597	0
2034	0.08	384	17,740	51,838	0
2035	0.08	0	12,533	45,589	0
2036	0.08	0	8,070	39,071	0
2037	0.08	0	4,482	32,436	0
2038	0.08	0	1,912	25,852	0
2039	0.08	0	424	19,586	0
2040	0.09	0	0	13,838	86,485
2041	0.09	0	0	8,910	81,952
2042	0.09	0	0	4,949	76,482
2043	0.09	0	0	2,111	70,211
2044	0.09	0	0	468	63,190
2045	0.10	0	0	0	55,573
2046	0.10	0	0	0	47,627
2047	0.10	0	0	0	39,539
	0.10				31,514

Technical Life (Years) = 15

Implementation Cost (2020\$/kWh) = 0.06
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.6566029
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.6611047
2030-2040 Maximum Reduction (MW) (2) =	0.6611851
2041-2045 Maximum Reduction (MW) (2) =	0.6624963
2020-2024 Bundle Energy Reduction (MWh) =	5,411
2025-2029 Bundle Energy Reduction (MWh) =	5,748
2030-2040 Bundle Energy Reduction (MWh) =	6,484
2041-2045 Bundle Energy Reduction (MWh) =	6,629

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

RP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
89	0	0	0	5	0	0	0
84	0	0	0	6	0	0	0
78	0	0	0	6	0	0	0
72	0	0	0	7	0	0	0
65	0	0	0	8	0	0	0
0	97	0	0	0	6	0	0
0	92	0	0	0	6	0	0
0	86	0	0	0	7	0	0
0	79	0	0	0	8	0	0
0	71	0	0	0	9	0	0
0	0	107	0	0	0	6	0
0	0	102	0	0	0	7	0
0	0	95	0	0	0	8	0
0	0	87	0	0	0	8	0
0	0	78	0	0	0	10	0
0	0	69	0	0	0	11	0
0	0	59	0	0	0	13	0
0	0	49	0	0	0	16	0
0	0	39	0	0	0	21	0
0	0	30	0	0	0	28	0
0	0	0	131	0	0	0	7
0	0	0	124	0	0	0	7
0	0	0	115	0	0	0	8
0	0	0	106	0	0	0	9
0	0	0	95	0	0	0	10
0	0	0	84	0	0	0	11
0	0	0	72	0	0	0	14
0	0	0	60	0	0	0	17
0	0	0	48	0	0	0	21

I&M_C_API&M_C_API&M_C_API&M_C_API&M_C_H&I&M_C_H&I&M_C_H&I&M_C_HAP_VFD_46

Bundle Name: C - VFD - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.09	87,303	0	0	0
2021	0.09	82,727	0	0	0
2022	0.09	77,206	0	0	0
2023	0.09	70,875	0	0	0
2024	0.09	63,787	0	0	0
2025	0.10	56,099	96,390	0	0
2026	0.10	48,077	91,337	0	0
2027	0.10	39,913	85,241	0	0
2028	0.10	31,812	78,251	0	0
2029	0.10	24,101	70,426	0	0
2030	0.11	17,028	61,938	106,422	0
2031	0.11	10,964	53,081	100,843	0
2032	0.11	6,090	44,067	94,113	0
2033	0.11	2,598	35,123	86,396	0
2034	0.12	576	26,610	77,756	0
2035	0.12	0	18,800	68,384	0
2036	0.12	0	12,105	58,606	0
2037	0.12	0	6,724	48,654	0
2038	0.12	0	2,868	38,779	0
2039	0.13	0	636	29,380	0
2040	0.13	0	0	20,756	129,728
2041	0.13	0	0	13,365	122,928
2042	0.13	0	0	7,423	114,724
2043	0.14	0	0	3,166	105,316
2044	0.14	0	0	702	94,785
2045	0.14	0	0	0	83,360
2046	0.15	0	0	0	71,440
2047	0.15	0	0	0	59,309
2048	0.15	0	0	0	47,271

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

0.09

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.6566029
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.6611047
2030-2040 Maximum Reduction (MW) (2) =	0.6611851
2041-2045 Maximum Reduction (MW) (2) =	0.6624963
2020-2024 Bundle Energy Reduction (MWh) =	2,599
2025-2029 Bundle Energy Reduction (MWh) =	2,444
2030-2040 Bundle Energy Reduction (MWh) =	2,150
2041-2045 Bundle Energy Reduction (MWh) =	2,200

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
133	0	0	0	3	0	0	0
126	0	0	0	3	0	0	0
118	0	0	0	3	0	0	0
108	0	0	0	3	0	0	0
97	0	0	0	4	0	0	0
0	146	0	0	0	2	0	0
0	138	0	0	0	3	0	0
0	129	0	0	0	3	0	0
0	118	0	0	0	3	0	0
0	107	0	0	0	4	0	0
0	0	161	0	0	0	2	0
0	0	153	0	0	0	2	0
0	0	142	0	0	0	3	0
0	0	131	0	0	0	3	0
0	0	118	0	0	0	3	0
0	0	103	0	0	0	4	0
0	0	89	0	0	0	4	0
0	0	74	0	0	0	5	0
0	0	59	0	0	0	7	0
0	0	44	0	0	0	9	0
0	0	0	196	0	0	0	2
0	0	0	186	0	0	0	2
0	0	0	173	0	0	0	3
0	0	0	159	0	0	0	3
0	0	0	143	0	0	0	3
0	0	0	126	0	0	0	4
0	0	0	108	0	0	0	4
0	0	0	90	0	0	0	6
0	0	0	71	0	0	0	7

2018 APCO

DSM Modelir

Bundle Name: HVAC & REFRIGERATION - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.10	99,875	0	0	0
2021	0.10	94,639	0	0	0
2022	0.10	88,323	0	0	0
2023	0.11	81,081	0	0	0
2024	0.11	72,973	0	0	0
2025	0.11	64,177	110,270	0	0
2026	0.11	55,000	104,489	0	0
2027	0.11	45,660	97,516	0	0
2028	0.12	36,393	89,520	0	0
2029	0.12	27,572	80,568	0	0
2030	0.12	19,479	70,857	121,747	0
2031	0.12	12,542	60,725	115,365	0
2032	0.13	6,967	50,413	107,666	0
2033	0.13	2,972	40,181	98,837	0
2034	0.13	659	30,442	88,953	0
2035	0.13	0	21,507	78,231	0
2036	0.14	0	13,848	67,045	0
2037	0.14	0	7,692	55,660	0
2038	0.14	0	3,281	44,363	0
2039	0.15	0	727	33,610	0
2040	0.15	0	0	23,745	148,409
2041	0.15	0	0	15,289	140,629
2042	0.15	0	0	8,492	131,244
2043	0.16	0	0	3,622	120,482
2044	0.16	0	0	803	108,434
2045	0.16	0	0	0	95,364
2046	0.17	0	0	0	81,728
2047	0.17	0	0	0	67,849
2048	0.17	0	0	0	54,078

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

0.10

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1909053
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.1933792
2030-2040 Maximum Reduction (MW) (2) =	0.1932788
2041-2045 Maximum Reduction (MW) (2) =	0.1935286
2020-2024 Bundle Energy Reduction (MWh) =	10,216
2025-2029 Bundle Energy Reduction (MWh) =	9,875
2030-2040 Bundle Energy Reduction (MWh) =	9,757
2041-2045 Bundle Energy Reduction (MWh) =	9,625

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
523	0	0	0	10	0	0	0
496	0	0	0	11	0	0	0
463	0	0	0	12	0	0	0
425	0	0	0	13	0	0	0
382	0	0	0	15	0	0	0
0	570	0	0	0	10	0	0
0	540	0	0	0	11	0	0
0	504	0	0	0	12	0	0
0	463	0	0	0	13	0	0
0	417	0	0	0	15	0	0
0	0	630	0	0	0	10	0
0	0	597	0	0	0	11	0
0	0	557	0	0	0	11	0
0	0	511	0	0	0	13	0
0	0	460	0	0	0	14	0
0	0	405	0	0	0	17	0
0	0	347	0	0	0	20	0
0	0	288	0	0	0	25	0
0	0	230	0	0	0	31	0
0	0	174	0	0	0	42	0
0	0	0	767	0	0	0	10
0	0	0	727	0	0	0	10
0	0	0	678	0	0	0	11
0	0	0	623	0	0	0	13
0	0	0	560	0	0	0	14
0	0	0	493	0	0	0	17
0	0	0	422	0	0	0	20
0	0	0	351	0	0	0	24
0	0	0	279	0	0	0	31

I&M_C_API&M_C_API&M_C_API&M_C_API&M_C_H&I&M_C_H&I&M_C_H&I&M_C_HAP_HVAC RE

FRIG_46

2018 APCO

DSM Modelir

Bundle Name: VAC & REFRIGERATION - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.15	149,812	0	0	0
2021	0.15	141,959	0	0	0
2022	0.16	132,485	0	0	0
2023	0.16	121,621	0	0	0
2024	0.16	109,459	0	0	0
2025	0.17	96,266	165,405	0	0
2026	0.17	82,501	156,734	0	0
2027	0.17	68,491	146,274	0	0
2028	0.18	54,589	134,280	0	0
2029	0.18	41,358	120,852	0	0
2030	0.18	29,219	106,285	182,620	0
2031	0.19	18,814	91,087	173,047	0
2032	0.19	10,450	75,619	161,498	0
2033	0.19	4,457	60,271	148,255	0
2034	0.20	988	45,663	133,430	0
2035	0.20	0	32,260	117,347	0
2036	0.21	0	20,772	100,568	0
2037	0.21	0	11,538	83,490	0
2038	0.21	0	4,921	66,544	0
2039	0.22	0	1,091	50,415	0
2040	0.22	0	0	35,618	222,613
2041	0.23	0	0	22,934	210,944
2042	0.23	0	0	12,738	196,866
2043	0.24	0	0	5,433	180,723
2044	0.24	0	0	1,205	162,650
2045	0.25	0	0	0	143,046
2046	0.25	0	0	0	122,591
2047	0.26	0	0	0	101,773
2048	0.26	0	0	0	81,117

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

0.15

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1909053
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.1933792
2030-2040 Maximum Reduction (MW) (2) =	0.1932788
2041-2045 Maximum Reduction (MW) (2) =	0.1935286
2020-2024 Bundle Energy Reduction (MWh) =	3,921
2025-2029 Bundle Energy Reduction (MWh) =	3,407
2030-2040 Bundle Energy Reduction (MWh) =	2,278
2041-2045 Bundle Energy Reduction (MWh) =	1,970

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
785	0	0	0	4	0	0	0
744	0	0	0	4	0	0	0
694	0	0	0	5	0	0	0
637	0	0	0	5	0	0	0
573	0	0	0	6	0	0	0
0	855	0	0	0	3	0	0
0	811	0	0	0	4	0	0
0	756	0	0	0	4	0	0
0	694	0	0	0	4	0	0
0	625	0	0	0	5	0	0
0	0	945	0	0	0	2	0
0	0	895	0	0	0	2	0
0	0	836	0	0	0	3	0
0	0	767	0	0	0	3	0
0	0	690	0	0	0	3	0
0	0	607	0	0	0	4	0
0	0	520	0	0	0	5	0
0	0	432	0	0	0	6	0
0	0	344	0	0	0	7	0
0	0	261	0	0	0	10	0
0	0	0	1,150	0	0	0	2
0	0	0	1,090	0	0	0	2
0	0	0	1,017	0	0	0	2
0	0	0	934	0	0	0	3
0	0	0	840	0	0	0	3
0	0	0	739	0	0	0	3
0	0	0	633	0	0	0	4
0	0	0	526	0	0	0	5
0	0	0	419	0	0	0	6

2018 APCO

DSM Modelir

Bundle Name: **COMMERCIAL OUTDOOR LIGHTING - AP**
C - COMMERCIAL OUTDOOR LIGHTING - HAP

45285--Joint Exhibit 4_Part 2--

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.10	100,664	0	0	0
2021	0.10	95,388	0	0	0
2022	0.10	89,022	0	0	0
2023	0.11	81,722	0	0	0
2024	0.11	73,550	0	0	0
2025	0.11	64,684	111,142	0	0
2026	0.11	55,435	105,316	0	0
2027	0.12	46,021	98,287	0	0
2028	0.12	36,681	90,228	0	0
2029	0.12	27,790	81,205	0	0
2030	0.12	19,634	71,417	122,709	0
2031	0.13	12,642	61,205	116,277	0
2032	0.13	7,022	50,811	108,517	0
2033	0.13	2,995	40,498	99,618	0
2034	0.13	664	30,682	89,657	0
2035	0.14	0	21,677	78,850	0
2036	0.14	0	13,957	67,575	0
2037	0.14	0	7,753	56,100	0
2038	0.14	0	3,307	44,714	0
2039	0.15	0	733	33,876	0
2040	0.15	0	0	23,933	149,582
2041	0.15	0	0	15,410	141,741
2042	0.16	0	0	8,559	132,281
2043	0.16	0	0	3,651	121,434
2044	0.16	0	0	810	109,291
2045	0.17	0	0	0	96,118
2046	0.17	0	0	0	82,374
2047	0.17	0	0	0	68,385
2048	0.18	0	0	0	54,506

Technical Life (Years) = **15**

Implementation Cost (2020\$/kWh) = 0.10
Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	3,093
2025-2029 Bundle Energy Reduction (MWh) =	3,463
2030-2040 Bundle Energy Reduction (MWh) =	2,688
2041-2045 Bundle Energy Reduction (MWh) =	2,347

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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-CAC-I&M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
570	0	0	0	3	0	0	0
540	0	0	0	3	0	0	0
504	0	0	0	4	0	0	0
463	0	0	0	4	0	0	0
417	0	0	0	5	0	0	0
0	628	0	0	0	3	0	0
0	595	0	0	0	4	0	0
0	555	0	0	0	4	0	0
0	510	0	0	0	5	0	0
0	459	0	0	0	5	0	0
0	0	694	0	0	0	3	0
0	0	658	0	0	0	3	0
0	0	614	0	0	0	3	0
0	0	563	0	0	0	4	0
0	0	507	0	0	0	4	0
0	0	446	0	0	0	5	0
0	0	382	0	0	0	5	0
0	0	317	0	0	0	7	0
0	0	253	0	0	0	9	0
0	0	192	0	0	0	12	0
0	0	0	846	0	0	0	2
0	0	0	802	0	0	0	3
0	0	0	748	0	0	0	3
0	0	0	687	0	0	0	3
0	0	0	618	0	0	0	3
0	0	0	544	0	0	0	4
0	0	0	466	0	0	0	5
0	0	0	387	0	0	0	6
0	0	0	308	0	0	0	8

I&M_C_API I&M_C_API I&M_C_API I&M_C_API I&M_C_HA I&M_C_HA I&M_C_HA I&M_C_HAP_Out Ligh

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2018 APCO

DSM Modelir

Bundle Name: | ERICIAL OUTDOOR LIGHTING - HAP

45285--Joint Exhibit 4_Part 2--

	Implementation Cost				
	(\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.15	150,997	0	0	0
2021	0.15	143,081	0	0	0
2022	0.16	133,532	0	0	0
2023	0.16	122,583	0	0	0
2024	0.16	110,325	0	0	0
2025	0.17	97,027	166,713	0	0
2026	0.17	83,153	157,974	0	0
2027	0.17	69,032	147,431	0	0
2028	0.18	55,021	135,341	0	0
2029	0.18	41,685	121,807	0	0
2030	0.18	29,450	107,125	184,064	0
2031	0.19	18,962	91,808	174,416	0
2032	0.19	10,533	76,217	162,775	0
2033	0.20	4,493	60,748	149,428	0
2034	0.20	996	46,024	134,485	0
2035	0.20	0	32,515	118,275	0
2036	0.21	0	20,936	101,363	0
2037	0.21	0	11,629	84,150	0
2038	0.22	0	4,960	67,070	0
2039	0.22	0	1,100	50,814	0
2040	0.22	0	0	35,900	224,373
2041	0.23	0	0	23,115	212,612
2042	0.23	0	0	12,839	198,422
2043	0.24	0	0	5,476	182,152
2044	0.24	0	0	1,214	163,936
2045	0.25	0	0	0	144,177
2046	0.25	0	0	0	123,561
2047	0.26	0	0	0	102,578
2048	0.26	0	0	0	81,758

Technical Life (Years) = 15

Implementation Cost (2020\$/kWh) = 0.15
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	1,109
2025-2029 Bundle Energy Reduction (MWh) =	1,388
2030-2040 Bundle Energy Reduction (MWh) =	906
2041-2045 Bundle Energy Reduction (MWh) =	738

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

IRP

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-CAC-I&M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
855	0	0	0	1	0	0	0
810	0	0	0	1	0	0	0
756	0	0	0	1	0	0	0
694	0	0	0	1	0	0	0
625	0	0	0	2	0	0	0
0	942	0	0	0	1	0	0
0	893	0	0	0	1	0	0
0	833	0	0	0	2	0	0
0	765	0	0	0	2	0	0
0	688	0	0	0	2	0	0
0	0	1,041	0	0	0	1	0
0	0	987	0	0	0	1	0
0	0	921	0	0	0	1	0
0	0	845	0	0	0	1	0
0	0	761	0	0	0	1	0
0	0	669	0	0	0	2	0
0	0	573	0	0	0	2	0
0	0	476	0	0	0	2	0
0	0	379	0	0	0	3	0
0	0	287	0	0	0	4	0
0	0	0	1,269	0	0	0	1
0	0	0	1,203	0	0	0	1
0	0	0	1,122	0	0	0	1
0	0	0	1,030	0	0	0	1
0	0	0	927	0	0	0	1
0	0	0	816	0	0	0	1
0	0	0	699	0	0	0	2
0	0	0	580	0	0	0	2
0	0	0	462	0	0	0	2

2018 APCO

DSM Modelir

Bundle Name: |MERCIAL INDOOR LIGHTING - AP

45285--Joint Exhibit 4_Part 2--

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.10	96,880	0	0	0
2021	0.10	91,802	0	0	0
2022	0.10	85,675	0	0	0
2023	0.10	78,650	0	0	0
2024	0.10	70,785	0	0	0
2025	0.11	62,253	106,964	0	0
2026	0.11	53,351	101,357	0	0
2027	0.11	44,291	94,592	0	0
2028	0.11	35,302	86,836	0	0
2029	0.12	26,745	78,152	0	0
2030	0.12	18,895	68,732	118,097	0
2031	0.12	12,166	58,904	111,906	0
2032	0.12	6,758	48,901	104,438	0
2033	0.13	2,882	38,976	95,874	0
2034	0.13	639	29,529	86,286	0
2035	0.13	0	20,862	75,886	0
2036	0.13	0	13,433	65,035	0
2037	0.14	0	7,461	53,991	0
2038	0.14	0	3,182	43,033	0
2039	0.14	0	706	32,603	0
2040	0.14	0	0	23,033	143,959
2041	0.15	0	0	14,831	136,413
2042	0.15	0	0	8,238	127,309
2043	0.15	0	0	3,514	116,870
2044	0.16	0	0	779	105,183
2045	0.16	0	0	0	92,505
2046	0.16	0	0	0	79,277
2047	0.17	0	0	0	65,815
2048	0.17	0	0	0	52,457

Technical Life (Years) = 15

Implementation Cost (2020\$/kWh) = 0.10
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	20,482
2025-2029 Bundle Energy Reduction (MWh) =	22,707
2030-2040 Bundle Energy Reduction (MWh) =	19,885
2041-2045 Bundle Energy Reduction (MWh) =	17,912

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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-CAC-I&M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
549	0	0	0	20	0	0	0
520	0	0	0	22	0	0	0
485	0	0	0	24	0	0	0
445	0	0	0	27	0	0	0
401	0	0	0	30	0	0	0
0	604	0	0	0	23	0	0
0	573	0	0	0	24	0	0
0	535	0	0	0	27	0	0
0	491	0	0	0	30	0	0
0	442	0	0	0	34	0	0
0	0	668	0	0	0	20	0
0	0	633	0	0	0	21	0
0	0	591	0	0	0	23	0
0	0	542	0	0	0	26	0
0	0	488	0	0	0	29	0
0	0	429	0	0	0	34	0
0	0	368	0	0	0	41	0
0	0	305	0	0	0	50	0
0	0	243	0	0	0	64	0
0	0	184	0	0	0	86	0
0	0	0	814	0	0	0	18
0	0	0	772	0	0	0	19
0	0	0	720	0	0	0	21
0	0	0	661	0	0	0	23
0	0	0	595	0	0	0	27
0	0	0	523	0	0	0	31
0	0	0	448	0	0	0	37
0	0	0	372	0	0	0	45
0	0	0	297	0	0	0	58

I&M_C_API I&M_C_API I&M_C_API I&M_C_API I&M_C_HA I&M_C_HA I&M_C_HA I&M_C_HAP_Ind Light

[illegible]

[illegible]

[illegible]

APCo_R_AP_Heat_30	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_30	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_30	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_30	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_30	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	630	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	597	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	557	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	511	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	460	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	405	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	347	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	288	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	230	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	174	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Light_25	Build Cost	0	\$/kW	1
APCo_R_AP_Light_25	Build Cost	0	\$/kW	1
APCo_R_AP_Light_25	Build Cost	570	\$/kW	1
APCo_R_AP_Light_25	Build Cost	540	\$/kW	1
APCo_R_AP_Light_25	Build Cost	504	\$/kW	1
APCo_R_AP_Light_25	Build Cost	463	\$/kW	1
APCo_R_AP_Light_25	Build Cost	417	\$/kW	1
APCo_R_AP_Light_25	Build Cost	0	\$/kW	1
APCo_R_AP_Light_25	Build Cost	0	\$/kW	1

[illegible]

[illegible]

APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	0	\$/kW	1
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APCo_R_AP_Th Shell_46	Build Cost	115	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	106	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	95	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	84	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	72	\$/kW	1
APCo_R_AP_Th Shell_46	Build Cost	60	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	549	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	520	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	485	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	445	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	401	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	0	\$/kW	1
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APCo_R_AP_Water Heat_25	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_25	Build Cost	0	\$/kW	1
APCo R AP Water Heat 25	Build Cost	0	\$/kW	1

[illegible]

APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
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APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	668	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	633	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	591	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	542	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	488	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	429	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	368	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	305	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	243	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	184	\$/kW	1
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APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_AP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
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APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
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APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo_R_HAP_App_25	Build Cost	#REF!	\$/kW	1
APCo R HAP App 25	Build Cost	#REF!	\$/kW	1

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

APCo_R_HAP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_HAP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_HAP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_HAP_Water Heat_46	Build Cost	0	\$/kW	1
APCo_R_HAP_Water Heat_46	Build Cost	0	\$/kW	1

Date From	Date To	Timeslice	Action	Expression	Scenario	Memo	Category
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1/1/2019 0:00			=				APCo EE
1/1/2020 0:00			=				APCo EE
1/1/2021 0:00			=				APCo EE
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1/1/2024 0:00	=	APCo EE
1/1/2025 0:00	=	APCo EE
1/1/2026 0:00	=	APCo EE
1/1/2027 0:00	=	APCo EE
1/1/2028 0:00	=	APCo EE
1/1/2029 0:00	=	APCo EE
1/1/2030 0:00	=	APCo EE
1/1/2031 0:00	=	APCo EE
1/1/2032 0:00	=	APCo EE
1/1/2033 0:00	=	APCo EE
1/1/2034 0:00	=	APCo EE
1/1/2035 0:00	=	APCo EE
1/1/2036 0:00	=	APCo EE
1/1/2037 0:00	=	APCo EE
1/1/2038 0:00	=	APCo EE
1/1/2039 0:00	=	APCo EE
1/1/2040 0:00	=	APCo EE
1/1/2041 0:00	=	APCo EE
1/1/2042 0:00	=	APCo EE

1/1/2043 0:00	=	APCo EE
1/1/2044 0:00	=	APCo EE
1/1/2045 0:00	=	APCo EE
1/1/2046 0:00	=	APCo EE
1/1/2047 0:00	=	APCo EE

45285--Joint Exhibit 4_Part 2--CAC-I&M Stipulation of I&M Witness Burnett

2018 APCO

DSM Modelir

Bundle Name: **MERCIAL INDOOR LIGHTING - HAP**

45285--Joint Exhibit 4_Part 2--

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.15	145,321	0	0	0
2021	0.15	137,703	0	0	0
2022	0.15	128,513	0	0	0
2023	0.15	117,975	0	0	0
2024	0.16	106,177	0	0	0
2025	0.16	93,379	160,446	0	0
2026	0.16	80,027	152,035	0	0
2027	0.17	66,437	141,889	0	0
2028	0.17	52,953	130,254	0	0
2029	0.17	40,118	117,228	0	0
2030	0.18	28,343	103,098	177,145	0
2031	0.18	18,249	88,356	167,859	0
2032	0.18	10,137	73,352	156,656	0
2033	0.19	4,324	58,464	143,811	0
2034	0.19	959	44,294	129,430	0
2035	0.20	0	31,293	113,829	0
2036	0.20	0	20,149	97,553	0
2037	0.20	0	11,192	80,987	0
2038	0.21	0	4,774	64,549	0
2039	0.21	0	1,059	48,904	0
2040	0.22	0	0	34,550	215,939
2041	0.22	0	0	22,246	204,619
2042	0.22	0	0	12,356	190,963
2043	0.23	0	0	5,271	175,304
2044	0.23	0	0	1,169	157,774
2045	0.24	0	0	0	138,757
2046	0.24	0	0	0	118,916
2047	0.25	0	0	0	98,722
2048	0.25	0	0	0	78,685

Technical Life (Years) = **15**

Implementation Cost (2020\$/kWh) = 0.15
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	5,707
2025-2029 Bundle Energy Reduction (MWh) =	6,936
2030-2040 Bundle Energy Reduction (MWh) =	4,674
2041-2045 Bundle Energy Reduction (MWh) =	3,591

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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-CAC-I&M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
823	0	0	0	6	0	0	0
780	0	0	0	6	0	0	0
728	0	0	0	7	0	0	0
668	0	0	0	7	0	0	0
601	0	0	0	8	0	0	0
0	907	0	0	0	7	0	0
0	859	0	0	0	7	0	0
0	802	0	0	0	8	0	0
0	736	0	0	0	9	0	0
0	663	0	0	0	10	0	0
0	0	1,002	0	0	0	5	0
0	0	949	0	0	0	5	0
0	0	886	0	0	0	5	0
0	0	813	0	0	0	6	0
0	0	732	0	0	0	7	0
0	0	644	0	0	0	8	0
0	0	552	0	0	0	10	0
0	0	458	0	0	0	12	0
0	0	365	0	0	0	15	0
0	0	277	0	0	0	20	0
0	0	0	1,221	0	0	0	4
0	0	0	1,157	0	0	0	4
0	0	0	1,080	0	0	0	4
0	0	0	992	0	0	0	5
0	0	0	892	0	0	0	5
0	0	0	785	0	0	0	6
0	0	0	673	0	0	0	7
0	0	0	558	0	0	0	9
0	0	0	445	0	0	0	12

2018 APCO

DSM Modelir

Bundle Name: **SCADA AND LOGGING MANAGEMENT SYSTEM - A 45285--Joint Exhibit 4_Part 2--CAC-I&M**

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.19	193,472	0	0	0
2021	0.20	175,831	0	0	0
2022	0.20	153,985	0	0	0
2023	0.21	129,142	0	0	0
2024	0.21	102,406	0	0	0
2025	0.21	75,617	213,608	0	0
2026	0.22	50,330	194,132	0	0
2027	0.22	28,669	170,012	0	0
2028	0.23	12,468	142,584	0	0
2029	0.23	3,006	113,065	0	0
2030	0.24	0	83,488	235,841	0
2031	0.24	0	55,569	214,337	0
2032	0.25	0	31,653	187,707	0
2033	0.25	0	13,765	157,424	0
2034	0.26	0	3,319	124,833	0
2035	0.26	0	0	92,177	0
2036	0.27	0	0	61,353	0
2037	0.27	0	0	34,947	0
2038	0.28	0	0	15,198	0
2039	0.28	0	0	3,664	0
2040	0.29	0	0	0	287,489
2041	0.29	0	0	0	261,276
2042	0.30	0	0	0	228,814
2043	0.31	0	0	0	191,899
2044	0.31	0	0	0	152,171
2045	0.32	0	0	0	112,363
2046	0.32	0	0	0	74,788
2047	0.33	0	0	0	42,600
2048	0.34	0	0	0	18,526

Technical Life (Years) = 10

Implementation Cost (2020\$/kWh) = 0.19
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	4,036
2025-2029 Bundle Energy Reduction (MWh) =	4,253
2030-2040 Bundle Energy Reduction (MWh) =	4,606
2041-2045 Bundle Energy Reduction (MWh) =	4,735

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1,096	0	0	0	4	0	0	0
996	0	0	0	5	0	0	0
872	0	0	0	5	0	0	0
731	0	0	0	6	0	0	0
580	0	0	0	8	0	0	0
0	1,207	0	0	0	4	0	0
0	1,097	0	0	0	5	0	0
0	961	0	0	0	6	0	0
0	806	0	0	0	7	0	0
0	639	0	0	0	9	0	0
0	0	1,334	0	0	0	5	0
0	0	1,212	0	0	0	5	0
0	0	1,062	0	0	0	6	0
0	0	890	0	0	0	7	0
0	0	706	0	0	0	9	0
0	0	521	0	0	0	13	0
0	0	347	0	0	0	20	0
0	0	198	0	0	0	36	0
0	0	86	0	0	0	84	0
0	0	21	0	0	0	354	0
0	0	0	1,626	0	0	0	5
0	0	0	1,478	0	0	0	5
0	0	0	1,294	0	0	0	6
0	0	0	1,085	0	0	0	8
0	0	0	861	0	0	0	10
0	0	0	636	0	0	0	13
0	0	0	423	0	0	0	20
0	0	0	241	0	0	0	37
0	0	0	105	0	0	0	86

I&M_C_API&M_C_API&M_C_API&M_C_API&M_C_H&I&M_C_H&I&M_C_H&I&M_C_HAP_BMS_46

2018 APCO

DSM Modelir

Bundle Name: NG MANAGEMENT SYSTEM - HAP

45285--Joint Exhibit 4_Part 2--

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.29	290,208	0	0	0
2021	0.30	263,746	0	0	0
2022	0.30	230,978	0	0	0
2023	0.31	193,714	0	0	0
2024	0.31	153,610	0	0	0
2025	0.32	113,426	320,413	0	0
2026	0.33	75,496	291,197	0	0
2027	0.33	43,003	255,018	0	0
2028	0.34	18,701	213,875	0	0
2029	0.35	4,509	169,597	0	0
2030	0.35	0	125,232	353,761	0
2031	0.36	0	83,353	321,505	0
2032	0.37	0	47,479	281,561	0
2033	0.38	0	20,648	236,136	0
2034	0.38	0	4,978	187,249	0
2035	0.39	0	0	138,266	0
2036	0.40	0	0	92,029	0
2037	0.41	0	0	52,421	0
2038	0.41	0	0	22,797	0
2039	0.42	0	0	5,496	0
2040	0.43	0	0	0	431,233
2041	0.44	0	0	0	391,913
2042	0.45	0	0	0	343,221
2043	0.46	0	0	0	287,848
2044	0.47	0	0	0	228,256
2045	0.48	0	0	0	168,545
2046	0.49	0	0	0	112,183
2047	0.50	0	0	0	63,900
2048	0.51	0	0	0	27,789

Technical Life (Years) = 10

Implementation Cost (2020\$/kWh) = 0.29
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.1765809
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.176948
2030-2040 Maximum Reduction (MW) (2) =	0.1767988
2041-2045 Maximum Reduction (MW) (2) =	0.1767859
2020-2024 Bundle Energy Reduction (MWh) =	1,770
2025-2029 Bundle Energy Reduction (MWh) =	1,608
2030-2040 Bundle Energy Reduction (MWh) =	1,380
2041-2045 Bundle Energy Reduction (MWh) =	1,325

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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-CAC-I&M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1,643	0	0	0	2	0	0	0
1,494	0	0	0	2	0	0	0
1,308	0	0	0	2	0	0	0
1,097	0	0	0	3	0	0	0
870	0	0	0	4	0	0	0
0	1,811	0	0	0	2	0	0
0	1,646	0	0	0	2	0	0
0	1,441	0	0	0	2	0	0
0	1,209	0	0	0	3	0	0
0	958	0	0	0	3	0	0
0	0	2,001	0	0	0	1	0
0	0	1,818	0	0	0	2	0
0	0	1,593	0	0	0	2	0
0	0	1,336	0	0	0	2	0
0	0	1,059	0	0	0	3	0
0	0	782	0	0	0	4	0
0	0	521	0	0	0	6	0
0	0	296	0	0	0	11	0
0	0	129	0	0	0	25	0
0	0	31	0	0	0	106	0
0	0	0	2,439	0	0	0	1
0	0	0	2,217	0	0	0	1
0	0	0	1,941	0	0	0	2
0	0	0	1,628	0	0	0	2
0	0	0	1,291	0	0	0	3
0	0	0	953	0	0	0	4
0	0	0	635	0	0	0	6
0	0	0	361	0	0	0	10
0	0	0	157	0	0	0	24

Generator	Property	Value	Data File	Units	Band	Date From
APCo_R_AP_App_25	Max Capacity	#REF!		MW	1	
APCo_R_AP_App_30	Max Capacity	#REF!		MW	1	
APCo_R_AP_App_46	Max Capacity	#REF!		MW	1	
APCo_R_AP_Bill_25	Max Capacity	#REF!		MW	1	
APCo_R_AP_Heat_25	Max Capacity	0.190905307		MW	1	
APCo_R_AP_Heat_30	Max Capacity	0.193379172		MW	1	
APCo_R_AP_Heat_46	Max Capacity	0.193278752		MW	1	
APCo_R_AP_Light_25	Max Capacity	0.176580898		MW	1	
APCo_R_AP_Th Shell_25	Max Capacity	0.656602942		MW	1	
APCo_R_AP_Th Shell_30	Max Capacity	0.661104712		MW	1	
APCo_R_AP_Th Shell_46	Max Capacity	0.661185077		MW	1	
APCo_R_AP_Water Heat_25	Max Capacity	0.176580898		MW	1	
APCo_R_AP_Water Heat_30	Max Capacity	0.176948022		MW	1	
APCo_R_AP_Water Heat_46	Max Capacity	0.176798756		MW	1	
APCo_R_HAP_App_25	Max Capacity	#REF!		MW	1	
APCo_R_HAP_App_30	Max Capacity	#REF!		MW	1	
APCo_R_HAP_App_46	Max Capacity	#REF!		MW	1	
APCo_R_HAP_Heat_25	Max Capacity	0.176580898		MW	1	
APCo_R_HAP_Heat_30	Max Capacity	0.176948022		MW	1	
APCo_R_HAP_Light_25	Max Capacity	0.176580898		MW	1	
APCo_R_HAP_Light_30	Max Capacity	0.176948022		MW	1	
APCo_R_HAP_Light_46	Max Capacity	0.176798756		MW	1	
APCo_R_HAP_Th Shell_25	Max Capacity	0.656602942		MW	1	
APCo_R_HAP_Th Shell_30	Max Capacity	0.661104712		MW	1	
APCo_R_HAP_Th Shell_46	Max Capacity	0.661185077		MW	1	
APCo_R_HAP_Water Heat_25	Max Capacity	0.176580898		MW	1	
APCo_R_HAP_Water Heat_30	Max Capacity	0.176948022		MW	1	
APCo_R_HAP_Water Heat_46	Max Capacity	0.176798756		MW	1	

xhibit 4_Part 2--CAC-I&M Stipulation of I&M Witness Burnett

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APCo_R_HAP_Water Heat_46	Max Units Built in Year	0	-	1
APCo_R_HAP_Water Heat_46	Max Units Built in Year	0	-	1
APCo_R_HAP_Water Heat_46	Max Units Built in Year	0	-	1
APCo_R_HAP_Water Heat_46	Max Units Built in Year	0	-	1
APCo_R_HAP_Water Heat_46	Max Units Built in Year	0	-	1

Date From	Date To	Timeslice	Action	Expression	Scenario	Memo	Category	Year
1/1/2018 0:00			=				APCo EE	2018
1/1/2019 0:00			=				APCo EE	2019
1/1/2020 0:00			=				APCo EE	2020
1/1/2021 0:00			=				APCo EE	2021
1/1/2022 0:00			=				APCo EE	2022
1/1/2023 0:00			=				APCo EE	2023
1/1/2024 0:00			=				APCo EE	2024
1/1/2025 0:00			=				APCo EE	2025
1/1/2026 0:00			=				APCo EE	2026
1/1/2027 0:00			=				APCo EE	2027
1/1/2028 0:00			=				APCo EE	2028
1/1/2029 0:00			=				APCo EE	2029
1/1/2030 0:00			=				APCo EE	2030
1/1/2031 0:00			=				APCo EE	2031
1/1/2032 0:00			=				APCo EE	2032
1/1/2033 0:00			=				APCo EE	2033
1/1/2034 0:00			=				APCo EE	2034
1/1/2035 0:00			=				APCo EE	2035
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1/1/2019 0:00			=				APCo EE	2019
1/1/2020 0:00			=				APCo EE	2020
1/1/2021 0:00			=				APCo EE	2021
1/1/2022 0:00			=				APCo EE	2022
1/1/2023 0:00			=				APCo EE	2023
1/1/2024 0:00			=				APCo EE	2024
1/1/2025 0:00			=				APCo EE	2025
1/1/2026 0:00			=				APCo EE	2026
1/1/2027 0:00			=				APCo EE	2027
1/1/2028 0:00			=				APCo EE	2028
1/1/2029 0:00			=				APCo EE	2029
1/1/2030 0:00			=				APCo EE	2030

1/1/2031 0:00	=	APCo EE	2031
1/1/2032 0:00	=	APCo EE	2032
1/1/2033 0:00	=	APCo EE	2033
1/1/2034 0:00	=	APCo EE	2034
1/1/2035 0:00	=	APCo EE	2035
1/1/2036 0:00	=	APCo EE	2036
1/1/2037 0:00	=	APCo EE	2037
1/1/2038 0:00	=	APCo EE	2038
1/1/2039 0:00	=	APCo EE	2039
1/1/2040 0:00	=	APCo EE	2040
1/1/2041 0:00	=	APCo EE	2041
1/1/2042 0:00	=	APCo EE	2042
1/1/2043 0:00	=	APCo EE	2043
1/1/2044 0:00	=	APCo EE	2044
1/1/2045 0:00	=	APCo EE	2045
1/1/2046 0:00	=	APCo EE	2046
1/1/2047 0:00	=	APCo EE	2047
1/1/2018 0:00	=	APCo EE	2018
1/1/2019 0:00	=	APCo EE	2019
1/1/2020 0:00	=	APCo EE	2020
1/1/2021 0:00	=	APCo EE	2021
1/1/2022 0:00	=	APCo EE	2022
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Witness Burnett

Technical Life	LCD			
	<2025	<30	<40	<=2045
	10	1,000	1,000	1,000
	15	1,000	1,000	1,000

Cost Escalation Rate	2%
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45285--Joint Exhibit 4_Part 2--CAC-I&M Stipulation of I&M Witness Burnett

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh) 2020-2024	Yearly Potential Savings (MWh) 2025-2029	Yearly Potential Savings (MWh) 2030-2039	Yearly Potential Savings (MWh) 2040-2045	Bundle Life	Modeling Degradation	Shape used
HVAC Equipment - AP	\$0.60	8,759	10,256	11,790	12,346	10	10	Res cool+heat
HVAC Equipment - HAP	\$0.90	1,777	1,956	1,799	1,770	10	10	Res cool+heat
Building Shell - AP	\$1.65	1,516	1,623	1,786	1,834	20	15	Res cool+heat
Building Shell - HAP	\$2.48	696	615	525	0	20	15	Res cool+heat
Appliances - AP	\$0.26	4,520	4,720	4,969	5,087	8	10	Res Other
Appliances - HAP	\$0.40	2,238	2,004	1,689	1,627	8	10	Res Other
Water Heating - AP	\$0.24	6,340	7,232	6,226	5,295	10	10	Res Other
Water Heating - HP	\$0.35	3,225	3,304	2,184	1,617	10	10	Res Other
Lighting - AP	\$0.64	0	0	1,954	1,866	11	10	Res Light
Lighting - HP	\$0.97	0	0	592	1,029	11	10	Res Light
Behavioral - AP	\$0.10	28,500	28,500	28,500	28,500	1	10	total res
Miscellaneous - AP	\$0.54	2,694	3,549	3,175	3,614	11	10	Res Other
Miscellaneous - HAP	\$0.81	919	786	977	1,184	11	10	Res Other

NOTE: The Yearly Potential Savings numbers in the above table are incremental. They represent the amount of energy savings available if all of the er

Max Capacities from Shape file				
	20-24	25-29	30-39	40-45
HVAC Equipment - AP	0.359248	0.356857	0.350383	0.336298
HVAC Equipment - HAP	0.359248	0.356857	0.350383	0.336298
Building Shell - AP	0.359248	0.356857	0.350383	0.336298
Building Shell - HAP	0.359248	0.356857	0.350383	0.336298
Appliances - AP	0.266955	0.267675	0.267724	0.268065
Appliances - HAP	0.266955	0.267675	0.267724	0.268065
Water Heating - AP	0.266955	0.267675	0.267724	0.268065
Water Heating - HP	0.266955	0.267675	0.267724	0.268065
Lighting - AP	0	0	0.358624	0.35903
Lighting - HP	0	0	0.358624	0.35903
Behavioral - AP	0.255211	0.258895	0.265046	0.273474
Miscellaneous - AP	0.266955	0.267675	0.267724	0.268065
Miscellaneous - HAP	0.266955	0.267675	0.267724	0.268065

Degradation Percentage			
Year	10-Year	1-Year	15-Year
1	100.00%	100.00%	100.00%
2	89.10%	100.00%	92.90%
3	76.50%	100.00%	85.00%
4	62.90%	100.00%	76.50%
5	48.90%	100.00%	67.50%
6	35.40%	100.00%	58.20%
7	23.10%	100.00%	48.90%
8	12.90%	100.00%	39.80%
9	5.50%	100.00%	31.10%
10	1.30%	100.00%	23.10%
11	0%	100.00%	16.00%
12	0%	100.00%	10.10%
13	0%	100.00%	5.50%
14	0%	100.00%	2.30%
15	0%	100.00%	0.50%

Bundle Name: | Miscellaneous - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.54	540,000	0	0	0
2021	0.55	490,763	0	0	0
2022	0.56	429,789	0	0	0
2023	0.57	360,450	0	0	0
2024	0.58	285,827	0	0	0
2025	0.60	211,056	596,204	0	0
2026	0.61	140,478	541,842	0	0
2027	0.62	80,017	474,522	0	0
2028	0.63	34,798	397,966	0	0
2029	0.65	8,390	315,576	0	0
2030	0.66	0	233,023	658,257	0
2031	0.67	0	155,099	598,237	0
2032	0.68	0	88,346	523,911	0
2033	0.70	0	38,420	439,386	0
2034	0.71	0	9,263	348,422	0
2035	0.73	0	0	257,276	0
2036	0.74	0	0	171,241	0
2037	0.76	0	0	97,541	0
2038	0.77	0	0	42,419	0
2039	0.79	0	0	10,227	0
2040	0.80	0	0	0	802,412
2041	0.82	0	0	0	729,248
2042	0.83	0	0	0	638,644
2043	0.85	0	0	0	535,610
2044	0.87	0	0	0	424,724
2045	0.89	0	0	0	313,618
2046	0.90	0	0	0	208,742
2047	0.92	0	0	0	118,902
2048	0.94	0	0	0	51,708

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.54

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	2,694
2025-2029 Bundle Energy Reduction (MWh) =	3,549
2030-2040 Bundle Energy Reduction (MWh) =	3,175
2041-2045 Bundle Energy Reduction (MWh) =	3,614

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
2,023	0	0	0	3	0	0	0
1,838	0	0	0	3	0	0	0
1,610	0	0	0	4	0	0	0
1,350	0	0	0	4	0	0	0
1,071	0	0	0	6	0	0	0
0	2,227	0	0	0	4	0	0
0	2,024	0	0	0	4	0	0
0	1,773	0	0	0	5	0	0
0	1,487	0	0	0	6	0	0
0	1,179	0	0	0	7	0	0
0	0	2,459	0	0	0	3	0
0	0	2,235	0	0	0	4	0
0	0	1,957	0	0	0	4	0
0	0	1,641	0	0	0	5	0
0	0	1,301	0	0	0	6	0
0	0	961	0	0	0	9	0
0	0	640	0	0	0	14	0
0	0	364	0	0	0	25	0
0	0	158	0	0	0	58	0
0	0	38	0	0	0	244	0
0	0	0	2,993	0	0	0	4
0	0	0	2,720	0	0	0	4
0	0	0	2,382	0	0	0	5
0	0	0	1,998	0	0	0	6
0	0	0	1,584	0	0	0	7
0	0	0	1,170	0	0	0	10
0	0	0	779	0	0	0	16
0	0	0	444	0	0	0	28
0	0	0	193	0	0	0	66

Bundle Name: | Miscellaneous - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.81	810,000	0	0	0
2021	0.83	736,144	0	0	0
2022	0.84	644,684	0	0	0
2023	0.86	540,675	0	0	0
2024	0.88	428,741	0	0	0
2025	0.89	316,584	894,305	0	0
2026	0.91	210,716	812,763	0	0
2027	0.93	120,026	711,783	0	0
2028	0.95	52,197	596,949	0	0
2029	0.97	12,584	473,364	0	0
2030	0.99	0	349,534	987,385	0
2031	1.01	0	232,648	897,356	0
2032	1.03	0	132,519	785,866	0
2033	1.05	0	57,630	659,080	0
2034	1.07	0	13,894	522,632	0
2035	1.09	0	0	385,914	0
2036	1.11	0	0	256,862	0
2037	1.13	0	0	146,311	0
2038	1.16	0	0	63,628	0
2039	1.18	0	0	15,340	0
2040	1.20	0	0	0	1,203,617
2041	1.23	0	0	0	1,093,872
2042	1.25	0	0	0	957,966
2043	1.28	0	0	0	803,414
2044	1.30	0	0	0	637,086
2045	1.33	0	0	0	470,427
2046	1.36	0	0	0	313,113
2047	1.38	0	0	0	178,353
2048	1.41	0	0	0	77,563

Technical Life (Years) = 10

Implementation Cost (2020\$/kWh) = 0.81
Cost Escalation Rate = 2.00%2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	919
2025-2029 Bundle Energy Reduction (MWh) =	786
2030-2040 Bundle Energy Reduction (MWh) =	977
2041-2045 Bundle Energy Reduction (MWh) =	1,184

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
3,034	0	0	0	1	0	0	0
2,758	0	0	0	1	0	0	0
2,415	0	0	0	1	0	0	0
2,025	0	0	0	1	0	0	0
1,606	0	0	0	2	0	0	0
0	3,341	0	0	0	1	0	0
0	3,036	0	0	0	1	0	0
0	2,659	0	0	0	1	0	0
0	2,230	0	0	0	1	0	0
0	1,768	0	0	0	2	0	0
0	0	3,688	0	0	0	1	0
0	0	3,352	0	0	0	1	0
0	0	2,935	0	0	0	1	0
0	0	2,462	0	0	0	2	0
0	0	1,952	0	0	0	2	0
0	0	1,441	0	0	0	3	0
0	0	959	0	0	0	4	0
0	0	547	0	0	0	8	0
0	0	238	0	0	0	18	0
0	0	57	0	0	0	75	0
0	0	0	4,490	0	0	0	1
0	0	0	4,081	0	0	0	1
0	0	0	3,574	0	0	0	2
0	0	0	2,997	0	0	0	2
0	0	0	2,377	0	0	0	2
0	0	0	1,755	0	0	0	3
0	0	0	1,168	0	0	0	5
0	0	0	665	0	0	0	9
0	0	0	289	0	0	0	22

Bundle Name: HVAC Equipment - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.60	602,789	0	0	0
2021	0.61	547,827	0	0	0
2022	0.63	479,764	0	0	0
2023	0.64	402,362	0	0	0
2024	0.65	319,062	0	0	0
2025	0.67	235,597	665,528	0	0
2026	0.68	156,812	604,845	0	0
2027	0.69	89,322	529,698	0	0
2028	0.71	38,845	444,240	0	0
2029	0.72	9,365	352,270	0	0
2030	0.73	0	260,118	734,797	0
2031	0.75	0	173,133	667,798	0
2032	0.76	0	98,618	584,829	0
2033	0.78	0	42,887	490,477	0
2034	0.80	0	10,340	388,935	0
2035	0.81	0	0	287,191	0
2036	0.83	0	0	191,153	0
2037	0.84	0	0	108,883	0
2038	0.86	0	0	47,351	0
2039	0.88	0	0	11,416	0
2040	0.90	0	0	0	895,713
2041	0.91	0	0	0	814,042
2042	0.93	0	0	0	712,904
2043	0.95	0	0	0	597,888
2044	0.97	0	0	0	474,109
2045	0.99	0	0	0	350,085
2046	1.01	0	0	0	233,014
2047	1.03	0	0	0	132,727
2048	1.05	0	0	0	57,721

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.60

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.3592481
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.3568573
2030-2040 Maximum Reduction (MW) (2) =	0.3503832
2041-2045 Maximum Reduction (MW) (2) =	0.3362975
2020-2024 Bundle Energy Reduction (MWh) =	8,759
2025-2029 Bundle Energy Reduction (MWh) =	10,256
2030-2040 Bundle Energy Reduction (MWh) =	11,790
2041-2045 Bundle Energy Reduction (MWh) =	12,346

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1,678	0	0	0	9	0	0	0
1,525	0	0	0	10	0	0	0
1,335	0	0	0	11	0	0	0
1,120	0	0	0	14	0	0	0
888	0	0	0	18	0	0	0
0	1,865	0	0	0	10	0	0
0	1,695	0	0	0	12	0	0
0	1,484	0	0	0	13	0	0
0	1,245	0	0	0	16	0	0
0	987	0	0	0	21	0	0
0	0	2,097	0	0	0	12	0
0	0	1,906	0	0	0	13	0
0	0	1,669	0	0	0	15	0
0	0	1,400	0	0	0	19	0
0	0	1,110	0	0	0	24	0
0	0	820	0	0	0	33	0
0	0	546	0	0	0	51	0
0	0	311	0	0	0	91	0
0	0	135	0	0	0	214	0
0	0	33	0	0	0	907	0
0	0	0	2,663	0	0	0	12
0	0	0	2,421	0	0	0	14
0	0	0	2,120	0	0	0	16
0	0	0	1,778	0	0	0	20
0	0	0	1,410	0	0	0	25
0	0	0	1,041	0	0	0	35
0	0	0	693	0	0	0	53
0	0	0	395	0	0	0	96
0	0	0	172	0	0	0	224

Bundle Name: HVAC Equipment - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.90	904,184	0	0	0
2021	0.92	821,740	0	0	0
2022	0.94	719,645	0	0	0
2023	0.96	603,543	0	0	0
2024	0.98	478,593	0	0	0
2025	1.00	353,395	998,292	0	0
2026	1.02	235,218	907,268	0	0
2027	1.04	133,982	794,547	0	0
2028	1.06	58,267	666,360	0	0
2029	1.08	14,048	528,405	0	0
2030	1.10	0	390,177	1,102,195	0
2031	1.12	0	259,699	1,001,697	0
2032	1.15	0	147,927	877,244	0
2033	1.17	0	64,331	735,715	0
2034	1.19	0	15,510	583,402	0
2035	1.22	0	0	430,787	0
2036	1.24	0	0	286,729	0
2037	1.27	0	0	163,324	0
2038	1.29	0	0	71,027	0
2039	1.32	0	0	17,124	0
2040	1.34	0	0	0	1,343,570
2041	1.37	0	0	0	1,221,063
2042	1.40	0	0	0	1,069,355
2043	1.43	0	0	0	896,833
2044	1.45	0	0	0	711,164
2045	1.48	0	0	0	525,127
2046	1.51	0	0	0	349,521
2047	1.54	0	0	0	199,091
2048	1.57	0	0	0	86,581

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.90

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000	
2030-2040 Energy Reduction (MWh) (1) =	1,000	
2041-2045 Energy Reduction (MWh) (1) =	1,000	
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.3592481	0.359248
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.3568573	0.356857
2030-2040 Maximum Reduction (MW) (2) =	0.3503832	0.350383
2041-2045 Maximum Reduction (MW) (2) =	0.3362975	0.336298
2020-2024 Bundle Energy Reduction (MWh) =	1,777	
2025-2029 Bundle Energy Reduction (MWh) =	1,956	
2030-2040 Bundle Energy Reduction (MWh) =	1,799	
2041-2045 Bundle Energy Reduction (MWh) =	1,770	

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
2,517	0	0	0	2	0	0	0
2,287	0	0	0	2	0	0	0
2,003	0	0	0	2	0	0	0
1,680	0	0	0	3	0	0	0
1,332	0	0	0	4	0	0	0
0	2,797	0	0	0	2	0	0
0	2,542	0	0	0	2	0	0
0	2,227	0	0	0	3	0	0
0	1,867	0	0	0	3	0	0
0	1,481	0	0	0	4	0	0
0	0	3,146	0	0	0	2	0
0	0	2,859	0	0	0	2	0
0	0	2,504	0	0	0	2	0
0	0	2,100	0	0	0	3	0
0	0	1,665	0	0	0	4	0
0	0	1,229	0	0	0	5	0
0	0	818	0	0	0	8	0
0	0	466	0	0	0	14	0
0	0	203	0	0	0	33	0
0	0	49	0	0	0	138	0
0	0	0	3,995	0	0	0	2
0	0	0	3,631	0	0	0	2
0	0	0	3,180	0	0	0	2
0	0	0	2,667	0	0	0	3
0	0	0	2,115	0	0	0	4
0	0	0	1,561	0	0	0	5
0	0	0	1,039	0	0	0	8
0	0	0	592	0	0	0	14
0	0	0	257	0	0	0	32

2018 IM IF

DSM Modelir

Bundle Name: Building Shell - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	1.65	1,652,212	0	0	0
2021	1.69	1,565,603	0	0	0
2022	1.72	1,461,118	0	0	0
2023	1.75	1,341,306	0	0	0
2024	1.79	1,207,175	0	0	0
2025	1.82	1,061,670	1,824,176	0	0
2026	1.86	909,863	1,728,553	0	0
2027	1.90	755,353	1,613,192	0	0
2028	1.94	602,043	1,480,910	0	0
2029	1.97	456,120	1,332,819	0	0
2030	2.01	322,246	1,172,170	2,014,038	0
2031	2.05	207,486	1,004,562	1,908,462	0
2032	2.10	115,247	833,971	1,781,094	0
2033	2.14	49,158	664,704	1,635,044	0
2034	2.18	10,900	503,594	1,471,540	0
2035	2.22	0	355,786	1,294,170	0
2036	2.27	0	229,081	1,109,117	0
2037	2.31	0	127,242	920,772	0
2038	2.36	0	54,275	733,887	0
2039	2.41	0	12,035	556,008	0
2040	2.46	0	0	392,816	2,455,101
2041	2.50	0	0	252,924	2,326,404
2042	2.55	0	0	140,486	2,171,144
2043	2.61	0	0	59,924	1,993,110
2044	2.66	0	0	13,287	1,793,799
2045	2.71	0	0	0	1,577,586
2046	2.76	0	0	0	1,352,008
2047	2.82	0	0	0	1,122,415
2048	2.88	0	0	0	894,605

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

1.65

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.3592481
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.3568573
2030-2040 Maximum Reduction (MW) (2) =	0.3503832
2041-2045 Maximum Reduction (MW) (2) =	0.3362975
2020-2024 Bundle Energy Reduction (MWh) =	1,516
2025-2029 Bundle Energy Reduction (MWh) =	1,623
2030-2040 Bundle Energy Reduction (MWh) =	1,786
2041-2045 Bundle Energy Reduction (MWh) =	1,834

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

RP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
4,599	0	0	0	2	0	0	0
4,358	0	0	0	2	0	0	0
4,067	0	0	0	2	0	0	0
3,734	0	0	0	2	0	0	0
3,360	0	0	0	2	0	0	0
0	5,112	0	0	0	2	0	0
0	4,844	0	0	0	2	0	0
0	4,521	0	0	0	2	0	0
0	4,150	0	0	0	2	0	0
0	3,735	0	0	0	2	0	0
0	0	5,748	0	0	0	2	0
0	0	5,447	0	0	0	2	0
0	0	5,083	0	0	0	2	0
0	0	4,666	0	0	0	2	0
0	0	4,200	0	0	0	3	0
0	0	3,694	0	0	0	3	0
0	0	3,165	0	0	0	4	0
0	0	2,628	0	0	0	4	0
0	0	2,095	0	0	0	6	0
0	0	1,587	0	0	0	8	0
0	0	0	7,300	0	0	0	2
0	0	0	6,918	0	0	0	2
0	0	0	6,456	0	0	0	2
0	0	0	5,927	0	0	0	2
0	0	0	5,334	0	0	0	3
0	0	0	4,691	0	0	0	3
0	0	0	4,020	0	0	0	4
0	0	0	3,338	0	0	0	5
0	0	0	2,660	0	0	0	6

2018 IM IF

DSM Modelir

Bundle Name: Building Shell - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	2.48	2,478,319	0	0	0
2021	2.53	2,348,405	0	0	0
2022	2.58	2,191,676	0	0	0
2023	2.63	2,011,959	0	0	0
2024	2.68	1,810,763	0	0	0
2025	2.74	1,592,506	2,736,264	0	0
2026	2.79	1,364,794	2,592,829	0	0
2027	2.85	1,133,030	2,419,788	0	0
2028	2.90	903,065	2,221,365	0	0
2029	2.96	684,180	1,999,229	0	0
2030	3.02	483,369	1,758,255	3,021,057	0
2031	3.08	311,229	1,506,843	2,862,693	0
2032	3.14	172,871	1,250,957	2,671,641	0
2033	3.21	73,737	997,057	2,452,567	0
2034	3.27	16,350	755,391	2,207,310	0
2035	3.34	0	533,679	1,941,256	0
2036	3.40	0	343,622	1,663,676	0
2037	3.47	0	190,863	1,381,157	0
2038	3.54	0	81,412	1,100,831	0
2039	3.61	0	18,052	834,012	0
2040	3.68	0	0	589,224	3,682,651
2041	3.76	0	0	379,387	3,489,607
2042	3.83	0	0	210,729	3,256,716
2043	3.91	0	0	89,885	2,989,665
2044	3.99	0	0	19,931	2,690,699
2045	4.07	0	0	0	2,366,380
2046	4.15	0	0	0	2,028,012
2047	4.23	0	0	0	1,683,623
2048	4.31	0	0	0	1,341,907

Technical Life (Years) =

15

Implementation Cost (2020\$/kWh) =

2.48

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.3592481
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.3568573
2030-2040 Maximum Reduction (MW) (2) =	0.3503832
2041-2045 Maximum Reduction (MW) (2) =	0.3362975
2020-2024 Bundle Energy Reduction (MWh) =	696
2025-2029 Bundle Energy Reduction (MWh) =	615
2030-2040 Bundle Energy Reduction (MWh) =	525
2041-2045 Bundle Energy Reduction (MWh) =	0

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

RP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
6,899	0	0	0	1	0	0	0
6,537	0	0	0	1	0	0	0
6,101	0	0	0	1	0	0	0
5,600	0	0	0	1	0	0	0
5,040	0	0	0	1	0	0	0
0	7,668	0	0	0	1	0	0
0	7,266	0	0	0	1	0	0
0	6,781	0	0	0	1	0	0
0	6,225	0	0	0	1	0	0
0	5,602	0	0	0	1	0	0
0	0	8,622	0	0	0	1	0
0	0	8,170	0	0	0	1	0
0	0	7,625	0	0	0	1	0
0	0	7,000	0	0	0	1	0
0	0	6,300	0	0	0	1	0
0	0	5,540	0	0	0	1	0
0	0	4,748	0	0	0	1	0
0	0	3,942	0	0	0	1	0
0	0	3,142	0	0	0	2	0
0	0	2,380	0	0	0	2	0
0	0	0	10,951	0	0	0	0
0	0	0	10,377	0	0	0	0
0	0	0	9,684	0	0	0	0
0	0	0	8,890	0	0	0	0
0	0	0	8,001	0	0	0	0
0	0	0	7,037	0	0	0	0
0	0	0	6,030	0	0	0	0
0	0	0	5,006	0	0	0	0
0	0	0	3,990	0	0	0	0

2018 IM II

DSM Modelir

Bundle Name: Appliances - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.26	264,080	0	0	0
2021	0.27	240,001	0	0	0
2022	0.27	210,183	0	0	0
2023	0.28	176,273	0	0	0
2024	0.29	139,780	0	0	0
2025	0.29	103,214	291,566	0	0
2026	0.30	68,699	264,981	0	0
2027	0.30	39,131	232,059	0	0
2028	0.31	17,018	194,620	0	0
2029	0.32	4,103	154,328	0	0
2030	0.32	0	113,957	321,912	0
2031	0.33	0	75,849	292,560	0
2032	0.33	0	43,204	256,212	0
2033	0.34	0	18,789	214,876	0
2034	0.35	0	4,530	170,391	0
2035	0.36	0	0	125,818	0
2036	0.36	0	0	83,743	0
2037	0.37	0	0	47,701	0
2038	0.38	0	0	20,744	0
2039	0.38	0	0	5,001	0
2040	0.39	0	0	0	392,409
2041	0.40	0	0	0	356,629
2042	0.41	0	0	0	312,321
2043	0.42	0	0	0	261,933
2044	0.42	0	0	0	207,706
2045	0.43	0	0	0	153,371
2046	0.44	0	0	0	102,083
2047	0.45	0	0	0	58,147
2048	0.46	0	0	0	25,287

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.26

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	4,520
2025-2029 Bundle Energy Reduction (MWh) =	4,720
2030-2040 Bundle Energy Reduction (MWh) =	4,969
2041-2045 Bundle Energy Reduction (MWh) =	5,087

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
989	0	0	0	5	0	0	0
899	0	0	0	5	0	0	0
787	0	0	0	6	0	0	0
660	0	0	0	7	0	0	0
524	0	0	0	9	0	0	0
0	1,089	0	0	0	5	0	0
0	990	0	0	0	5	0	0
0	867	0	0	0	6	0	0
0	727	0	0	0	8	0	0
0	577	0	0	0	10	0	0
0	0	1,202	0	0	0	5	0
0	0	1,093	0	0	0	6	0
0	0	957	0	0	0	6	0
0	0	803	0	0	0	8	0
0	0	636	0	0	0	10	0
0	0	470	0	0	0	14	0
0	0	313	0	0	0	22	0
0	0	178	0	0	0	39	0
0	0	77	0	0	0	90	0
0	0	19	0	0	0	382	0
0	0	0	1,464	0	0	0	5
0	0	0	1,330	0	0	0	6
0	0	0	1,165	0	0	0	7
0	0	0	977	0	0	0	8
0	0	0	775	0	0	0	10
0	0	0	572	0	0	0	14
0	0	0	381	0	0	0	22
0	0	0	217	0	0	0	39
0	0	0	94	0	0	0	92

2018 IM II

DSM Modelir

Bundle Name: Appliances - HAP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.40	396,120	0	0	0
2021	0.40	360,002	0	0	0
2022	0.41	315,274	0	0	0
2023	0.42	264,410	0	0	0
2024	0.43	209,670	0	0	0
2025	0.44	154,821	437,348	0	0
2026	0.45	103,048	397,471	0	0
2027	0.46	58,697	348,088	0	0
2028	0.46	25,526	291,930	0	0
2029	0.47	6,154	231,493	0	0
2030	0.48	0	170,935	482,868	0
2031	0.49	0	113,773	438,840	0
2032	0.50	0	64,806	384,318	0
2033	0.51	0	28,183	322,314	0
2034	0.52	0	6,795	255,587	0
2035	0.53	0	0	188,726	0
2036	0.54	0	0	125,615	0
2037	0.55	0	0	71,552	0
2038	0.57	0	0	31,117	0
2039	0.58	0	0	7,502	0
2040	0.59	0	0	0	588,613
2041	0.60	0	0	0	534,944
2042	0.61	0	0	0	468,481
2043	0.62	0	0	0	392,899
2044	0.64	0	0	0	311,559
2045	0.65	0	0	0	230,056
2046	0.66	0	0	0	153,124
2047	0.68	0	0	0	87,221
2048	0.69	0	0	0	37,931

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.40

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	2,238
2025-2029 Bundle Energy Reduction (MWh) =	2,004
2030-2040 Bundle Energy Reduction (MWh) =	1,689
2041-2045 Bundle Energy Reduction (MWh) =	1,627

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1,484	0	0	0	2	0	0	0
1,349	0	0	0	3	0	0	0
1,181	0	0	0	3	0	0	0
990	0	0	0	4	0	0	0
785	0	0	0	5	0	0	0
0	1,634	0	0	0	2	0	0
0	1,485	0	0	0	2	0	0
0	1,300	0	0	0	3	0	0
0	1,091	0	0	0	3	0	0
0	865	0	0	0	4	0	0
0	0	1,804	0	0	0	2	0
0	0	1,639	0	0	0	2	0
0	0	1,435	0	0	0	2	0
0	0	1,204	0	0	0	3	0
0	0	955	0	0	0	3	0
0	0	705	0	0	0	5	0
0	0	469	0	0	0	7	0
0	0	267	0	0	0	13	0
0	0	116	0	0	0	31	0
0	0	28	0	0	0	130	0
0	0	0	2,196	0	0	0	2
0	0	0	1,996	0	0	0	2
0	0	0	1,748	0	0	0	2
0	0	0	1,466	0	0	0	3
0	0	0	1,162	0	0	0	3
0	0	0	858	0	0	0	5
0	0	0	571	0	0	0	7
0	0	0	325	0	0	0	13
0	0	0	141	0	0	0	30

0
0
0
0
0
0
0
0
0
0
0
0
2
2
2
3
3
5
7
13
31
130
0
0
0
0
0
0
0
0

Bundle Name: Water Heating - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.24	235,684	0	0	0
2021	0.24	214,195	0	0	0
2022	0.25	187,583	0	0	0
2023	0.25	157,319	0	0	0
2024	0.26	124,750	0	0	0
2025	0.26	92,116	260,215	0	0
2026	0.27	61,312	236,488	0	0
2027	0.27	34,924	207,106	0	0
2028	0.28	15,188	173,693	0	0
2029	0.28	3,662	137,734	0	0
2030	0.29	0	101,703	287,298	0
2031	0.29	0	67,693	261,102	0
2032	0.30	0	38,559	228,662	0
2033	0.30	0	16,769	191,771	0
2034	0.31	0	4,043	152,070	0
2035	0.32	0	0	112,289	0
2036	0.32	0	0	74,739	0
2037	0.33	0	0	42,572	0
2038	0.34	0	0	18,514	0
2039	0.34	0	0	4,464	0
2040	0.35	0	0	0	350,215
2041	0.36	0	0	0	318,282
2042	0.36	0	0	0	278,738
2043	0.37	0	0	0	233,768
2044	0.38	0	0	0	185,372
2045	0.39	0	0	0	136,880
2046	0.39	0	0	0	91,106
2047	0.40	0	0	0	51,895
2048	0.41	0	0	0	22,568

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.24

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	6,340
2025-2029 Bundle Energy Reduction (MWh) =	7,232
2030-2040 Bundle Energy Reduction (MWh) =	6,226
2041-2045 Bundle Energy Reduction (MWh) =	5,295

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
883	0	0	0	6	0	0	0
802	0	0	0	7	0	0	0
703	0	0	0	8	0	0	0
589	0	0	0	10	0	0	0
467	0	0	0	13	0	0	0
0	972	0	0	0	7	0	0
0	883	0	0	0	8	0	0
0	774	0	0	0	9	0	0
0	649	0	0	0	11	0	0
0	515	0	0	0	15	0	0
0	0	1,073	0	0	0	6	0
0	0	975	0	0	0	7	0
0	0	854	0	0	0	8	0
0	0	716	0	0	0	10	0
0	0	568	0	0	0	13	0
0	0	419	0	0	0	18	0
0	0	279	0	0	0	27	0
0	0	159	0	0	0	48	0
0	0	69	0	0	0	113	0
0	0	17	0	0	0	479	0
0	0	0	1,306	0	0	0	5
0	0	0	1,187	0	0	0	6
0	0	0	1,040	0	0	0	7
0	0	0	872	0	0	0	8
0	0	0	692	0	0	0	11
0	0	0	511	0	0	0	15
0	0	0	340	0	0	0	23
0	0	0	194	0	0	0	41
0	0	0	84	0	0	0	96

Bundle Name: Water Heating - HP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.35	353,527	0	0	0
2021	0.36	321,292	0	0	0
2022	0.37	281,374	0	0	0
2023	0.38	235,979	0	0	0
2024	0.38	187,125	0	0	0
2025	0.39	138,174	390,322	0	0
2026	0.40	91,968	354,732	0	0
2027	0.41	52,386	310,660	0	0
2028	0.41	22,782	260,540	0	0
2029	0.42	5,492	206,601	0	0
2030	0.43	0	152,555	430,947	0
2031	0.44	0	101,540	391,653	0
2032	0.45	0	57,838	342,993	0
2033	0.46	0	25,153	287,657	0
2034	0.47	0	6,064	228,104	0
2035	0.48	0	0	168,433	0
2036	0.49	0	0	112,108	0
2037	0.50	0	0	63,858	0
2038	0.50	0	0	27,771	0
2039	0.52	0	0	6,695	0
2040	0.53	0	0	0	525,322
2041	0.54	0	0	0	477,423
2042	0.55	0	0	0	418,107
2043	0.56	0	0	0	350,652
2044	0.57	0	0	0	278,058
2045	0.58	0	0	0	205,319
2046	0.59	0	0	0	136,659
2047	0.60	0	0	0	77,842
2048	0.62	0	0	0	33,852

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.35

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2669548
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2676748
2030-2040 Maximum Reduction (MW) (2) =	0.2677241
2041-2045 Maximum Reduction (MW) (2) =	0.2680646
2020-2024 Bundle Energy Reduction (MWh) =	3,225
2025-2029 Bundle Energy Reduction (MWh) =	3,304
2030-2040 Bundle Energy Reduction (MWh) =	2,184
2041-2045 Bundle Energy Reduction (MWh) =	1,617

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1,324	0	0	0	3	0	0	0
1,204	0	0	0	4	0	0	0
1,054	0	0	0	4	0	0	0
884	0	0	0	5	0	0	0
701	0	0	0	7	0	0	0
0	1,458	0	0	0	3	0	0
0	1,325	0	0	0	4	0	0
0	1,161	0	0	0	4	0	0
0	973	0	0	0	5	0	0
0	772	0	0	0	7	0	0
0	0	1,610	0	0	0	2	0
0	0	1,463	0	0	0	2	0
0	0	1,281	0	0	0	3	0
0	0	1,074	0	0	0	3	0
0	0	852	0	0	0	4	0
0	0	629	0	0	0	6	0
0	0	419	0	0	0	9	0
0	0	239	0	0	0	17	0
0	0	104	0	0	0	40	0
0	0	25	0	0	0	168	0
0	0	0	1,960	0	0	0	2
0	0	0	1,781	0	0	0	2
0	0	0	1,560	0	0	0	2
0	0	0	1,308	0	0	0	3
0	0	0	1,037	0	0	0	3
0	0	0	766	0	0	0	5
0	0	0	510	0	0	0	7
0	0	0	290	0	0	0	13
0	0	0	126	0	0	0	29

Bundle Name: Lighting - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.64	643,797	0	0	0
2021	0.66	585,095	0	0	0
2022	0.67	512,402	0	0	0
2023	0.68	429,734	0	0	0
2024	0.70	340,768	0	0	0
2025	0.71	251,624	710,804	0	0
2026	0.73	167,480	645,993	0	0
2027	0.74	95,398	565,733	0	0
2028	0.75	41,487	474,461	0	0
2029	0.77	10,002	376,235	0	0
2030	0.78	0	277,814	784,785	0
2031	0.80	0	184,911	713,228	0
2032	0.82	0	105,327	624,615	0
2033	0.83	0	45,805	523,844	0
2034	0.85	0	11,043	415,394	0
2035	0.87	0	0	306,729	0
2036	0.88	0	0	204,157	0
2037	0.90	0	0	116,290	0
2038	0.92	0	0	50,573	0
2039	0.94	0	0	12,193	0
2040	0.96	0	0	0	956,648
2041	0.98	0	0	0	869,421
2042	1.00	0	0	0	761,402
2043	1.02	0	0	0	638,562
2044	1.04	0	0	0	506,363
2045	1.06	0	0	0	373,901
2046	1.08	0	0	0	248,866
2047	1.10	0	0	0	141,757
2048	1.12	0	0	0	61,648

Technical Life (Years) =

10

Implementation Cost (2020\$/kWh) =

0.64

Cost Escalation Rate =

2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ =

1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0
2030-2040 Maximum Reduction (MW) (2) =	0.3586243
2041-2045 Maximum Reduction (MW) (2) =	0.35903
2020-2024 Bundle Energy Reduction (MWh) =	0
2025-2029 Bundle Energy Reduction (MWh) =	0
2030-2040 Bundle Energy Reduction (MWh) =	1,954
2041-2045 Bundle Energy Reduction (MWh) =	1,866

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

RP

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M Stipulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	0	2,188	0	0	0	2	0
0	0	1,989	0	0	0	2	0
0	0	1,742	0	0	0	3	0
0	0	1,461	0	0	0	3	0
0	0	1,158	0	0	0	4	0
0	0	855	0	0	0	6	0
0	0	569	0	0	0	8	0
0	0	324	0	0	0	15	0
0	0	141	0	0	0	36	0
0	0	34	0	0	0	150	0
0	0	0	2,665	0	0	0	2
0	0	0	2,422	0	0	0	2
0	0	0	2,121	0	0	0	2
0	0	0	1,779	0	0	0	3
0	0	0	1,410	0	0	0	4
0	0	0	1,041	0	0	0	5
0	0	0	693	0	0	0	8
0	0	0	395	0	0	0	14
0	0	0	172	0	0	0	34

2018 IM II

DSM Modelir

Bundle Name: Lighting - HP

45285--Joint Exhibit 4_Part 2--CAC-I&M Stip

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.97	965,695	0	0	0
2021	0.99	877,643	0	0	0
2022	1.00	768,602	0	0	0
2023	1.02	644,601	0	0	0
2024	1.05	511,151	0	0	0
2025	1.07	377,437	1,066,205	0	0
2026	1.09	251,219	968,989	0	0
2027	1.11	143,097	848,599	0	0
2028	1.13	62,231	711,692	0	0
2029	1.15	15,003	564,352	0	0
2030	1.18	0	416,721	1,177,177	0
2031	1.20	0	277,366	1,069,842	0
2032	1.22	0	157,991	936,922	0
2033	1.25	0	68,708	785,765	0
2034	1.27	0	16,565	623,091	0
2035	1.30	0	0	460,093	0
2036	1.33	0	0	306,235	0
2037	1.35	0	0	174,435	0
2038	1.38	0	0	75,859	0
2039	1.41	0	0	18,289	0
2040	1.43	0	0	0	1,434,972
2041	1.46	0	0	0	1,304,131
2042	1.49	0	0	0	1,142,103
2043	1.52	0	0	0	957,844
2044	1.55	0	0	0	759,544
2045	1.58	0	0	0	560,851
2046	1.62	0	0	0	373,299
2047	1.65	0	0	0	212,635
2048	1.68	0	0	0	92,471

Technical Life (Years) = 10

Implementation Cost (2020\$/kWh) = 0.97
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0
2030-2040 Maximum Reduction (MW) (2) =	0.3586243
2041-2045 Maximum Reduction (MW) (2) =	0.35903
2020-2024 Bundle Energy Reduction (MWh) =	0
2025-2029 Bundle Energy Reduction (MWh) =	0
2030-2040 Bundle Energy Reduction (MWh) =	592
2041-2045 Bundle Energy Reduction (MWh) =	1,029

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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ulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
#DIV/0!	0	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	#DIV/0!	0	0	0	0	0	0
0	0	3,282	0	0	0	1	0
0	0	2,983	0	0	0	1	0
0	0	2,613	0	0	0	1	0
0	0	2,191	0	0	0	1	0
0	0	1,737	0	0	0	1	0
0	0	1,283	0	0	0	2	0
0	0	854	0	0	0	3	0
0	0	486	0	0	0	5	0
0	0	212	0	0	0	11	0
0	0	51	0	0	0	46	0
0	0	0	3,997	0	0	0	1
0	0	0	3,632	0	0	0	1
0	0	0	3,181	0	0	0	1
0	0	0	2,668	0	0	0	2
0	0	0	2,116	0	0	0	2
0	0	0	1,562	0	0	0	3
0	0	0	1,040	0	0	0	4
0	0	0	592	0	0	0	8
0	0	0	258	0	0	0	19

2018 IM IF

DSM Modelir

Bundle Name: Behavioral - AP

45285--Joint Exhibit 4_Part 2--CAC-I&M Stip

	Implementation Cost (\$/kWh)	(\$) <2025	(\$) <2030	(\$) <2040	(\$) <2045
2018	0.00	0	0	0	0
2019	0.00	0	0	0	0
2020	0.10	101,039	0	0	0
2021	0.10	91,826	0	0	0
2022	0.11	80,417	0	0	0
2023	0.11	67,443	0	0	0
2024	0.11	53,481	0	0	0
2025	0.11	0	111,555	0	0
2026	0.11	0	101,383	0	0
2027	0.12	0	88,787	0	0
2028	0.12	0	74,463	0	0
2029	0.12	0	59,047	0	0
2030	0.12	0	0	123,165	0
2031	0.13	0	0	111,935	0
2032	0.13	0	0	98,028	0
2033	0.13	0	0	82,213	0
2034	0.13	0	0	65,193	0
2035	0.14	0	0	48,139	0
2036	0.14	0	0	32,041	0
2037	0.14	0	0	18,251	0
2038	0.14	0	0	7,937	0
2039	0.15	0	0	1,914	0
2040	0.15	0	0	0	150,138
2041	0.15	0	0	0	136,448
2042	0.16	0	0	0	119,496
2043	0.16	0	0	0	100,217
2044	0.16	0	0	0	79,469
2045	0.17	0	0	0	58,681
2046	0.17	0	0	0	39,057
2047	0.17	0	0	0	22,248
2048	0.18	0	0	0	9,675

Technical Life (Years) = 10

Implementation Cost (2020\$/kWh) = 0.10
 Cost Escalation Rate = 2.00%

2020-2024 Energy Reduction (MWh)⁽¹⁾ = 1,000

2025-2029 Energy Reduction (MWh) ⁽¹⁾ =	1,000
2030-2040 Energy Reduction (MWh) (1) =	1,000
2041-2045 Energy Reduction (MWh) (1) =	1,000
2020-2024 Maximum Reduction (MW) ⁽²⁾ =	0.2552109
2025-2029 Maximum Reduction (MW) ⁽²⁾ =	0.2588953
2030-2040 Maximum Reduction (MW) (2) =	0.2650462
2041-2045 Maximum Reduction (MW) (2) =	0.2734739
2020-2024 Bundle Energy Reduction (MWh) =	28,500
2025-2029 Bundle Energy Reduction (MWh) =	28,500
2030-2040 Bundle Energy Reduction (MWh) =	28,500
2041-2045 Bundle Energy Reduction (MWh) =	28,500

Notes:

(1) This value should be based on the annual energy reduction of the smallest DSM bundle from all of the DSM alternatives. The smallest Bundle is Residential Bundle 7 for all time segments

(2) This value should be used for the Maximum Capacity input in LT Plan. Value should be based on respective time segments maximum demand value from the loadshape input into the model for this alternative

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ulation of I&M Witness Burnett

<2025	<2030	<=2040	<=2045	<2025	<2030	<=2040	<=2045
Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Build Cost (\$/kW)	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year	Max Units Built in Year
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
396	0	0	0	29	0	0	0
360	0	0	0	29	0	0	0
315	0	0	0	29	0	0	0
264	0	0	0	29	0	0	0
210	0	0	0	29	0	0	0
0	431	0	0	0	29	0	0
0	392	0	0	0	29	0	0
0	343	0	0	0	29	0	0
0	288	0	0	0	29	0	0
0	228	0	0	0	29	0	0
0	0	465	0	0	0	29	0
0	0	422	0	0	0	29	0
0	0	370	0	0	0	29	0
0	0	310	0	0	0	29	0
0	0	246	0	0	0	29	0
0	0	182	0	0	0	29	0
0	0	121	0	0	0	29	0
0	0	69	0	0	0	29	0
0	0	30	0	0	0	29	0
0	0	7	0	0	0	29	0
0	0	0	549	0	0	0	29
0	0	0	499	0	0	0	29
0	0	0	437	0	0	0	29
0	0	0	366	0	0	0	29
0	0	0	291	0	0	0	29
0	0	0	215	0	0	0	29
0	0	0	143	0	0	0	29
0	0	0	81	0	0	0	29
0	0	0	35	0	0	0	29