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AZ CORP COMMISSION
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March 1, 2016

Arizona Corporation Commission
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Docket Control
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, AZ 85007

RE: Arizona Public Service Company's 2015 Demand Side Management (DSM) Progress Report; Docket No. E-00000U-16-0069.

Pursuant to the Electric Energy Efficiency Standard Rules (EERS) and A.A.C. R14-2-2409(A):

By March 1 of each year, an affected utility shall submit . . . a DSM progress report providing information on each of the affected utility's Commission-approved DSM programs. . .

In addition, Decisions No. 73089, 74006, 74703, and 74813 require the DSM Progress Reports to include supplemental information. As a result, APS submits its 2015 DSM Annual Progress Report in compliance with EERS and the above-referenced decisions.

If you have any questions regarding this information, please contact Kerri A. Carnes at (602) 250-3341.

Sincerely,

Kerri A. Carnes

KC/kr

cc: Barbara Keene
Brian Bozzo

ARIZONA PUBLIC SERVICE COMPANY

2015 DEMAND SIDE MANAGEMENT ANNUAL PROGRESS REPORT

March 1, 2016



aps

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I. Introduction

Arizona Public Service Company ("APS" or "Company") is filing this Demand Side Management Annual Progress Report ("Progress Report") for 2015 ("Reporting Period") in compliance with R14-2-2409(A) and the reporting requirements contained in Arizona Corporation Commission ("ACC" or "Commission") Decision Nos. 73089 (April 4, 2012), 74406 (March 19, 2014), 74703 (August 21, 2014), and 74813 (November 13, 2014). This report includes the following information for all APS Demand Side Management ("DSM") programs that were in place during the Reporting Period:

- APS's progress toward meeting the cumulative energy efficiency standard;
- An identification of Commission approved DSM Programs and measures by customer segment;
- A description of the findings from any research projects completed;
- A brief description of the programs;
- Program goals, objectives, and savings targets;
- Level of customer participation;
- Costs incurred disaggregated by type of cost, such as administrative costs, rebates, and monitoring costs;
- A description of the results of evaluation and monitoring activities;
- kW and kWh savings;
- Environmental benefits including reduced emissions and water savings;
- Incremental benefits and net benefits in dollars;
- Performance Incentive calculations;
- Problems encountered and proposed solutions;
- A description of modifications proposed for the following year;
- If applicable, program or program measure termination and proposed date of termination;
- Where applicable, reporting requirements included in Commission Decision No. 73089, 74406, 74703, and 74813. Due to the length of Decision No. 74703 reporting requirements, this information has been included in separate work papers; and
- Other significant information.

II. 2015 DSM Program Results

A. Compliance with Energy Efficiency ("EE") Requirements

For calendar year 2015, the Commission established a cumulative annual EE requirement of 9.50 percent of the utility's 2014 retail kilowatt-hour ("kWh") sales. A summary of APS's 2015 compliance with the Energy Efficiency Standard is shown in Table 1. In 2015, the Company achieved 102% of the Commission's annual EE goal. APS achieved the cumulative megawatt hour ("MWh") savings goal for 2015, achieving cumulative savings of 9.55% against a goal of 9.50%, while spending \$2.8 million less than the overall budget approved for 2015 of \$68.9 million.

Table 1
2015 DSM Savings Goal & Achievement

Goal Calculation	
2014 Retail Sales ¹	27,017,353
2015 Cumulative EE Standard	<u>9.50%</u>
2015 Goal (MWh)	2,566,649
Less Cumulative Savings from 2014 Applied to 2015 ²	<u>2,026,753</u>
2015 DSM Savings Goal	539,896
Results	
Contribution From Demand Response (10% of Goal)	53,990
Contribution From Energy Efficiency Programs	<u>498,434</u>
Total 2015 MWh Achieved	552,424
Over or (Under) 2015 Goal	12,528
% of 2015 Savings Goal Achieved	102.3%
2015 Annual Savings % of 2014 Retail Sales	2.04%
2015 Cumulative Savings as a % of 2014 Retail Sales	9.55%
3rd Party MER Verified Savings for 2015	552,069
Difference: 2015 MER Verified to 2015 APR	(355)

Note:

¹Includes billed and unbilled sales, does not include line losses, excludes Freeport McMoran Mine

²Cumulative savings through 2014 are MER Verified MWh savings.

III. Program Results and Program Incentive Calculations

Program expenses are provided in Tables 2a through 3b and DSM program megawatt ("MW") and MWh savings are provided in Tables 4 and 5. Tables 6 and 7 provide net benefits and Table 8 shows the performance incentive calculation for 2015. Table 9 provides the environmental benefits associated with the lifetime energy savings resulting from DSM programs. Table 10 shows 2015 demand response ("DR") load reduction and savings values.

Year To Date DSM Program Expenses

Table 2a
Demand Response Program Expenses 2015

Program	Measurement Evaluation and				Program Implementation ¹	Program Marketing	Planning & Administration	Total Program Costs
	Rebates & Incentives	Research ("MER")	Metering					
HEI Pilot ²	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Marketing & MER of Rate Options	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Peak Solutions	\$0	\$0	\$0	\$1,762,296	\$0	\$28,662	\$1,790,958	
Total	\$0	\$0	\$0	\$1,762,296	\$0	\$28,662	\$1,790,958	

Table 2b
Energy Efficiency Program Expenses 2015

Program	Training &			Program Implementation ¹	Program Marketing	Planning & Administration	Total Program Costs
	Rebates & Incentives	Technical Assistance	Consumer Education				
Residential Programs							
Consumer Products	\$4,621,674	\$0	\$0	\$3,064,113	\$163,538	\$417,028	\$8,266,353
Existing Homes HVAC	\$5,297,417	\$130,824	\$121,466	\$1,257,272	\$110,777	\$322,662	\$7,240,418
Existing Homes - Home Performance	\$1,325,377	\$1,761	\$4,751	\$928,233	\$61,866	\$109,452	\$2,431,440
New Construction	\$4,124,379	\$7,205	\$452	\$663,363	\$163,739	\$340,477	\$5,299,615
Appliance Recycling	\$288,630	\$0	\$0	\$477,673	\$185,138	\$108,055	\$1,059,496
Conservation Behavior	\$0	\$0	\$0	\$1,437,721	\$0	\$60,613	\$1,498,334
Multi-Family	\$879,280	\$0	\$0	\$846,527	\$32,033	\$94,915	\$1,852,755
Shade Tree	\$424	\$0	\$0	\$325	\$0	\$0	\$749
Prepaid Energy Conservation ²	\$0	\$0	\$0	\$7,866	\$1,744	\$47,832	\$57,442
Limited Income	\$2,092,653	\$0	\$22,541	\$59,186	\$23,959	\$76,003	\$2,274,342
Total	\$18,629,834	\$139,790	\$149,210	\$8,742,279	\$742,794	\$1,577,037	\$29,980,944
Non-Residential Programs							
Large Existing Facilities	\$13,666,171	\$176,262	\$8,125	\$4,146,342	\$826,794	\$440,019	\$19,263,713
New Construction	\$2,540,830	\$28,010	\$1,310	\$589,999	\$10,161	\$76,881	\$3,247,191
Small Business	\$1,473,246	\$27,606	\$2,432	\$546,778	\$111,043	\$87,885	\$2,248,990
Energy Information Services	\$31,526	\$0	\$0	\$5,141	\$0	\$218	\$36,885
Schools ³	\$1,341,909	\$13,786	\$732	\$838,925	\$30,240	\$56,522	\$2,282,114
Total	\$19,053,682	\$245,664	\$12,599	\$6,127,185	\$978,238	\$661,525	\$27,078,893
Codes & Standards	\$0	\$0	\$0	\$147,252	\$0	\$25,325	\$172,577
Total EE Program Costs	\$37,683,516	\$385,454	\$161,809	\$15,016,716	\$1,721,032	\$2,263,887	\$57,232,414
Measurement, Evaluation & Research							\$1,835,226
Performance Incentive ⁴							\$5,275,737
Total EE Program Expense							\$64,343,377
Total DSM Expense							\$66,134,335

Notes:

¹Includes the cost for the Implementation Contractor.

²The HEI Pilot incurred carry cost of 362,3673, and the Prepaid Energy Conservation Program incurred carrying cost of \$241,338 in 2015

³Schools are permitted to receive funding from other Non-Residential programs. Refer to the Schools Program section for additional information regarding total funds allocated to school districts.

⁴Details of the Performance Incentive calculation are provided in Table 8.

Table 2c

2015 Energy Efficiency Program Implementation Costs - APS Compared to Contractor¹

Program	APS Expense	Contractor Expense	Total Implementation Cost
Residential Programs			
Consumer Products	\$244,291	\$2,819,822	\$3,064,113
Existing Homes HVAC	\$12,899	\$1,244,373	\$1,257,272
Existing Homes - Home Performance	\$2,475	\$925,758	\$928,233
New Construction	\$359,467	\$303,896	\$663,363
Appliance Recycling	\$7,178	\$470,495	\$477,673
Conservation Behavior	\$32,718	\$1,405,003	\$1,437,721
Multi-Family	\$34,578	\$811,949	\$846,527
Shade Tree	\$0	\$325	\$325
Prepaid Energy Conservation	\$304	\$7,562	\$7,866
Limited Income	<u>\$0</u>	<u>\$59,186</u>	<u>\$59,186</u>
Residential Total	\$693,910	\$8,048,369	\$8,742,279
Non-Residential Programs		\$8,048,369	
Large Existing Facilities	\$0	\$4,146,342	\$4,146,342
New Construction	\$0	\$589,999	\$589,999
Small Business	\$0	\$546,778	\$546,778
Energy Information Services	\$0	\$5,141	\$5,141
Schools	<u>\$0</u>	<u>\$838,925</u>	\$838,925
Non-Residential Total	\$0	\$6,127,185	\$6,127,185
Codes & Standards	<u>\$104,928</u>	<u>\$42,324</u>	<u>\$147,252</u>
EE Implementation Costs	\$798,838	\$14,217,878	\$15,016,716

¹Required by Commission Decision No. 73089.

Program-To-Date DSM Program Expenses

Table 3a

Program-To-Date Demand Response Program Expenses: January 2010 - December 2015

Program	Rebates & Incentives	Measurement Evaluation and Research	Metering	Program Implementation ¹	Program Marketing	Planning & Administration	Total Program Costs
HEI Pilot	\$596,904	\$242,929	\$0	\$706,433	\$129,123	\$569,131	\$2,244,520
Marketing & MER of Rate Options	\$0	\$0	\$37,756	\$147,290	\$168,016	\$0	\$353,062
Peak Solutions	\$0	\$0	\$51,017	\$13,065,354	\$0	\$292,142	\$13,408,513
Total	\$596,904	\$242,929	\$88,773	\$13,919,077	\$297,139	\$861,273	\$16,006,095

Table 3b

Program-To-Date: Energy Efficiency Program Expenses: January 2005 - December 2015

Program	Rebates & Incentives	Training & Technical Assistance	Consumer Education	Program Implementation ¹	Program Marketing	Planning & Administration	Total Program Costs
Residential Programs							
Consumer Products	\$37,050,222	\$4,633	\$53,335	\$19,188,031	\$4,066,742	\$2,407,194	\$62,770,157
Existing Homes HVAC	\$35,956,544	\$1,205,894	\$1,789,706	\$9,443,873	\$2,077,306	\$1,556,029	\$52,029,352
Existing Homes - Home Performance	\$11,218,853	\$127,461	\$7,695	\$6,744,756	\$929,526	\$514,015	\$19,542,306
New Construction	\$19,693,935	\$775,036	\$130,597	\$3,259,915	\$3,043,725	\$1,520,844	\$28,424,052
Appliance Recycling	\$1,520,331	\$0	\$0	\$3,721,457	\$1,143,867	\$356,276	\$6,741,931
Conservation Behavior	\$0	\$0	\$0	\$4,637,641	\$0	\$337,151	\$4,974,792
Multi-Family	\$2,589,979	\$5,511	\$101	\$3,552,367	\$64,391	\$427,959	\$6,640,308
Shade Tree	\$165,813	\$0	\$3,837	\$725,169	\$19,407	\$57,191	\$971,417
Prepaid Energy Conservation	\$0	\$0	\$0	\$7,866	\$1,744	\$47,832	\$57,442
Limited Income	\$18,005,223	\$118,015	\$57,764	\$829,046	\$122,969	\$1,134,117	\$20,267,134
Total	\$126,200,900	\$2,236,550	\$2,043,035	\$52,110,121	\$11,469,677	\$8,358,608	\$202,418,891
Non-Residential Programs							
Large Existing Facilities	\$83,936,973	\$1,485,335	\$307,947	\$22,194,061	\$4,532,725	\$3,080,608	\$115,537,649
New Construction	\$16,860,886	\$271,878	\$60,026	\$6,482,146	\$1,278,871	\$904,638	\$25,858,445
Small Business	\$11,716,276	\$186,477	\$31,986	\$5,025,909	\$950,847	\$639,788	\$18,551,283
Building Operator Training	\$0	\$56,897	\$0	\$22,043	\$15,783	\$7,480	\$102,203
Energy Information Services	\$206,752	\$18,317	\$1,753	\$221,259	\$12,686	\$29,112	\$489,879
Schools ²	\$11,520,706	\$260,946	\$28,922	\$4,717,292	\$823,064	\$566,068	\$17,916,998
Total	\$124,241,593	\$2,279,850	\$430,634	\$38,662,710	\$7,613,976	\$5,227,694	\$178,456,457
Codes & Standards	\$0	\$0	\$0	\$359,723	\$0	\$84,585	\$444,308
Total EE Program Costs	\$250,442,493	\$4,516,400	\$2,473,669	\$91,132,554	\$19,083,653	\$13,670,887	\$381,319,656
						Measurement, Evaluation & Research	\$16,634,195
						Performance Incentive ³	\$46,856,199
						Total EE Program Expense	\$444,810,050
						Total DSM Expense	\$460,816,145

Notes:

¹Includes the cost for the Implementation Contractor.

²Schools are permitted to receive funding from other Non-Residential programs. Refer to the Schools Program section for additional information regarding total funds allocated to school districts.

³Details of the Performance Incentive calculation are provided in Table 8. The program-to-date performance incentive amount is a summation of the performance incentive amount as calculated during each previous reporting period beginning with the January through June 2005 Progress Report.

D Year-to-Date DSM Electric Savings

Table 4
DSM Electric Savings 2015^{1, 3, 5}

Program	Gross Peak MW Capacity Savings	Gross Annual MWH Savings	Gross Lifetime MWH Savings ²	Capacity Savings ⁴	Net Annual MWH Savings ⁴	Net Lifetime MWH Savings ^{2, 4}
Residential Programs						
Consumer Products	11.6	110,744	970,205	11.6	110,744	970,205
Existing Homes HVAC	14.0	18,232	243,598	14.0	18,232	243,598
Existing Homes - Home Performance	2.6	3,947	61,418	2.6	3,947	61,418
New Construction	5.8	11,257	225,140	5.8	11,257	225,140
Appliance Recycling	1.2	8,374	50,243	1.2	8,374	50,243
Conservation Behavior	12.0	57,444	57,444	12.0	57,444	57,444
Multi-Family	1.6	9,623	115,668	1.6	9,623	115,668
Prepaid Energy Conservation	0.4	1,929	1,929	0.4	1,929	1,929
Limited Income	<u>0.3</u>	<u>1,793</u>	<u>31,369</u>	<u>0.3</u>	<u>1,793</u>	<u>31,369</u>
Total	49.5	223,343	1,757,014	49.5	223,343	1,757,014
Non-Residential Programs						
Large Existing Facilities	32.7	164,814	2,368,952	32.7	164,814	2,368,952
New Construction	7.7	33,426	472,719	7.7	33,426	472,719
Small Business	4.1	14,867	178,080	4.1	14,867	178,080
Energy Information Services	2.1	31	157	2.1	31	157
Schools	<u>3.8</u>	<u>12,925</u>	<u>192,453</u>	<u>3.8</u>	<u>12,925</u>	<u>192,453</u>
Total	50.4	226,063	3,212,361	50.4	226,063	3,212,361
Codes & Standards	11.9	45,915	476,139	11.9	45,915	476,139
System Savings	0.1	3,113	16,322	0.1	3,113	16,322
DR Contribution		<u>53,990</u>			<u>53,990</u>	
Total DSM Savings	111.9	552,424	5,461,836	111.9	552,424	5,461,836

Notes:

¹Savings for 2008 and after are MER adjusted, per Decision No. 69663, and savings prior to 2008 are not MER adjusted.

²Refers to savings over the expected lifetime of all program measures.

³Savings are adjusted for line losses (energy 7.0%, demand 11.7%) and a capacity reserve factor of 15%.

⁴Based on 2010 MER net to gross ratio ("NTGR") analysis, APS is utilizing a NTGR of 1.0 for all DSM programs and measures. workpapers.

Program-To-Date DSM Electric Savings

Table 5
Program-To-Date DSM Electric Savings: January 2005 - December 2015^{1,3}

Program	Gross Peak MW Capacity Savings	Gross Annual MWH Savings	Gross Lifetime MWH Savings ²	Net Peak MW Capacity Savings ⁴	Net Annual MWH Savings ⁴	Net Lifetime MWH Savings ^{2,4}
Residential Programs						
Consumer Products	153.9	1,349,181	8,627,460	135.5	1,203,088	7,794,051
Existing Homes HVAC	75.8	112,328	1,477,985	66.3	102,891	1,337,812
Existing Homes - Home Performance	19.2	33,265	463,825	19.0	32,860	459,368
New Construction	48.5	93,152	1,863,035	47.6	91,148	1,822,949
Appliance Recycling	10.0	66,195	397,166	9.2	60,756	364,532
Conservation Behavior	28.4	150,845	150,845	28.4	150,845	150,845
Multi-Family	4.0	35,884	352,653	4.0	35,884	352,653
Shade Tree	1.1	2,005	60,114	1.1	2,005	60,114
Prepaid Energy Conservation	0.4	1,929	1,929	0.4	1,929	1,929
Limited Income	<u>2.2</u>	<u>14,576</u>	<u>264,128</u>	<u>2.2</u>	<u>14,576</u>	<u>264,128</u>
Total	343.5	1,859,360	13,659,140	313.7	1,695,982	12,608,381
Non-Residential Programs						
Large Existing Facilities	175.1	1,158,693	15,645,653	169.8	1,112,478	15,011,697
New Construction	38.8	284,550	4,085,915	36.2	249,189	3,582,135
Small Business	27.8	130,851	1,773,586	27.1	126,705	1,716,275
Building Operator Training	0.2	1,001	12,447	0.1	701	8,713
Energy Information Services	8.6	2,892	42,204	8.6	2,892	42,204
Schools	<u>22.8</u>	<u>116,787</u>	<u>1,651,856</u>	<u>21.9</u>	<u>111,499</u>	<u>1,571,727</u>
Total	273.3	1,694,774	23,211,661	263.7	1,603,464	21,932,751
Codes & Standards	23.9	107,648	928,205	23.9	107,648	928,205
System Savings	0.1	3,113	16,322	0.1	3,113	16,322
DR Contribution		<u>254,132</u>			<u>254,132</u>	
Total DSM Savings	640.8	3,919,027	37,815,328	601.4	3,664,339	35,485,659

Notes:

¹Savings for 2008 and after are MER adjusted, per Decision No. 69663, and savings prior to 2008 are not MER adjusted.

²Refers to savings over the expected lifetime of all program measures.

³Savings are adjusted for line losses (energy 7.0%, demand 11.7%) and a capacity reserve factor of 15%.

⁴Based on 2010 MER Net to Gross Ratio ("NTGR") analysis, APS is utilizing a NTGR of 1.0 for all DSM programs and measures.

Year-to-Date Energy Efficiency Societal Benefits

Table 6
Energy Efficiency Societal Benefits 2015

Program	Program Cost	Societal Benefits	Societal Cost	Net Benefits	Benefit/Cost Ratio
Residential Programs					
Consumer Products	\$8,266,353	42,287,663	18,310,872	\$23,976,791	2.31
Existing Homes HVAC	\$7,240,418	\$19,951,598	\$9,879,333	\$10,072,265	2.02
Existing Homes - Home Performance	\$2,431,440	\$5,356,516	\$4,738,339	\$618,177	1.13
New Construction	\$5,299,615	\$13,580,248	\$10,203,494	\$3,376,754	1.33
Appliance Recycling	\$1,059,496	\$1,321,243	\$770,866	\$550,377	1.71
Conservation Behavior	\$1,498,334	\$1,739,776	\$1,498,334	\$241,443	1.16
Multi-Family	\$1,852,755	\$5,904,394	\$2,580,188	\$3,324,206	2.29
Prepaid Energy Conservation	\$57,442	\$58,409	\$57,442	\$967	1.02
Limited Income ^{1,2}	\$2,274,342	\$2,264,936	\$2,264,936	\$0	1.00
Total	\$29,980,195	\$92,464,784	\$50,303,804	\$42,160,980	1.84
Non-Residential Programs					
Large Existing Facilities	\$19,263,713	\$71,354,925	\$50,284,798	\$21,070,127	1.42
New Construction	\$3,247,191	\$17,436,828	\$6,914,515	\$10,522,313	2.52
Small Business	\$2,248,990	\$6,121,524	\$3,669,339	\$2,452,185	1.67
Energy Information Services	\$36,884	\$919,651	\$80,604	\$839,047	11.41
Schools	\$2,282,114	\$5,773,180	\$5,614,935	\$158,245	1.03
Total	\$27,078,892	\$101,606,108	\$66,564,191	\$35,041,917	1.53
Codes & Standards	\$172,577	\$20,303,192	\$18,414,855	\$1,888,337	
Measurement, Evaluation & Research	\$1,835,226	\$0	\$1,835,226	-\$1,835,226	
Performance Incentive	\$5,275,737	\$0	\$5,275,737	-\$5,275,737	
Total Energy Efficiency Societal Benefits	\$64,342,627	\$214,374,084	\$142,393,813	\$71,980,271	1.51

Notes:

¹Program Costs include weatherization and bill assistance. Societal Costs do not include bill assistance because it does not contribute to electric savings.

²APS analysis is consistent with Decision No. 68647.

6. Program To-Date EE Societal Benefits

Table 7

Program-To-Date Energy Efficiency Societal Benefits: January 2005 - December 2015

Program	Program Cost	Societal Benefits	Societal Cost	Net Benefits
Residential Programs				
Consumer Products	\$62,770,157	\$387,400,351	\$105,022,332	\$282,378,019
Existing Homes HVAC	\$52,029,352	\$106,951,066	\$74,825,786	\$32,125,280
Existing Homes - Home Performance	\$19,542,306	\$40,672,948	\$32,296,553	\$8,376,395
New Construction	\$28,424,052	\$113,857,763	\$60,937,512	\$52,920,252
Appliance Recycling	\$6,741,931	\$17,548,709	\$5,222,843	\$12,325,866
Conservation Behavior	\$4,974,792	\$5,128,929	\$4,860,973	\$267,957
Multi-Family	\$6,640,309	\$16,782,597	\$8,713,949	\$8,068,648
Shade Tree	\$970,668	\$4,512,595	\$2,357,226	\$2,155,369
Prepaid Energy Conservation	\$57,442	\$58,409	\$57,442	\$967
Limited Income ^{1,2}	\$20,267,134	\$18,231,022	\$18,231,022	\$0
Total	\$202,418,143	\$711,144,390	\$312,525,638	\$398,618,752
Non-Residential Programs				
Large Existing Facilities	\$115,537,649	\$624,966,341	\$271,732,700	\$353,233,641
New Construction	\$25,858,445	\$158,354,111	\$52,994,956	\$105,359,155
Small Business	\$18,551,283	\$91,664,696	\$27,770,830	\$63,893,866
Building Operator Training	\$102,203	\$424,302	\$183,392	\$240,910
Energy Information Services	\$489,878	\$3,259,171	\$859,863	\$2,399,308
Schools	\$17,916,998	\$75,817,042	\$39,466,085	\$36,350,957
Total	\$178,456,456	\$954,485,663	\$393,007,826	\$561,477,837
Codes & Standards	\$444,308	\$39,518,587	\$30,534,694	\$8,983,893
Measurement, Evaluation & Research	\$16,634,195	\$0	\$16,634,195	-\$16,634,195
Performance Incentive	\$46,859,932	\$0	\$46,859,932	-\$46,859,932
Total Energy Efficiency Societal Benefits	\$444,813,034	\$1,705,148,640	\$799,562,285	\$905,586,355

Notes:

¹Program Costs include weatherization and bill assistance. Societal Costs do not include bill assistance because it does not contribute to electric savings.

²APS analysis is consistent with Decision No. 68647.

IV 2015 Performance Incentive Calculations

Table 8
2015 Performance Incentive

Achievement Relative to Performance Incentive Level	
Total MWh Saved in 2015	552,424
Less System Savings	3,113
Total MWh Saved less System Savings	549,311
Total MWh Saved less System Savings as % of 2015 Goal	101.7%

Achievement Relative to DSM Goal	Performance Incentive as % of Net Benefits	Performance Incentive Capped at No More Than \$0.0125 per kWh saved
96% to 105%	7%	
Net Benefits (Prior to PI and Codes & Standards)	\$75,367,671	503,396,000 kWh x \$0.0125
Calculation of Performance Incentive	\$5,275,737	\$6,292,450
Performance Incentive Amount for 2015 (Minimum of % of Net Benefits or Capped amount at \$0.0125 per kWh)	\$5,275,737	

Notes:

¹The Performance Incentive methodology/calculation was approved in Decision No. 69663 and was modified in Decision No. 71448 and Decision No. 74406.

I. Net Environmental Benefits

Table 9
2015 Net Environmental Benefits

Reporting Period	Water (Mil Gal)	SOx (Lbs)	NOx (Lbs)	CO2 (Mil Lbs)	PM10 (Lbs)
Year-to-Date: Jan - Dec	1,731	24,305	461,798	4,910	134,907
Program-to-Date: Since Jan 2005	11,249	157,911	3,000,312	31,902	876,496

Notes:

¹The environmental reductions are based on the net energy savings of all program measures installed during the Reporting Period over their expected lifetimes.

²Some measures will result in customer water savings, which this calculation does not include. Only utility water savings are included in this calculation.

Demand Response Load Reduction and Energy Savings

Table 10
Demand Response Program/Initiatives¹
Load Reduction and Energy Savings 2015

Program/Initiative	Load Reduction (MW)	Energy Savings (MWh) ²
APS Peak Solutions	29.4	128,680
Critical Peak Pricing	0.2	832
Peak Time Rebates	0.4	1,752
Time of Use Rates & Super Peak	157.0	687,660
Total	187.0	818,924

Maximum Demand Response Counted Towards the EES (10% of annual goal) ³	53,990
-----------------------------------------------------------------------------------	---------------

Notes:

¹No load reduction was assumed for the HEI Pilot because the savings are unknown at this time.

²Energy Savings (MWh) = Load reduction (MW) X (8,760/2) hours which is a 50% load factor.

³Per ACC Decision No. 71436, the credit for demand response and load management peak reductions shall not exceed 10% of the EE standard for any year.

K. Supplemental Charts

Table 11

DSM Funds Billed by Customer Class: January - December 2015¹

DSM Funds Collected by Class (\$000)*	
Residential	\$24,248,598
Commercial	\$23,355,096
Industrial	\$3,511,963
Irrigation	\$38,356
Streetlights	\$267,351
Other Public Authority	\$5,208
Total DSM Funds	\$51,426,572

* Does not include \$10 million collected in base rates through the system benefits charge.

Table 12

Retail Sales by Customer Class: January - December 2015

Retail Sales	Year End 2015
Residential	13,159,754
Commercial	12,364,153
Industrial	2,264,610
Irrigation	10,923
Hwy Lighting & Other Public Authority	151,051
Total Retail Sales (MWhs)	27,950,491

Table 13

EE Savings for the Following Rate Schedules: January - December 2015¹

Rate Schedule	MW Savings	Annual MWh Savings	Lifetime MWh Savings
E-32 L	10.5	58,657	979,328
E-32 TOU	2.0	10,052	155,797
E-34	2.1	12,544	171,900
E-35	2.3	7,623	87,788
E36 XL	-	-	-
GS on E-30	0.0	57	401
Lighting Services	0.1	371	4,715

Note: this table contains a subset of all non-residential rates, therefore the totals do not match Table 4.

Terms and Definitions Used in Tables 1-13

Consumer Education: Funds allocated to support general consumer education about EE improvements and programs.

Free-riders: Program participants who would have installed the energy-efficient DSM measures anyway, even if the program were not in operation.

Gross Savings: Demand and energy savings related to the DSM programs prior to accounting for reductions for free riders and additions for spillover.

Measurement, Evaluation & Research ("MER"): Activities that will identify current baseline energy efficiency levels and the market potential of DSM measures, perform process evaluations, verify that energy-efficient measures are installed, track savings, and identify additional EE research.

Net Savings: Demand and energy savings related to the DSM programs after accounting for reductions for free-riders and additions for spillover.

Performance Incentive: Percentage share of DSM net economic benefits (benefits minus costs), capped at \$0.0125 per kWh, depending on the percent of MWh savings goal achieved.

Planning and Administration: APS's costs to plan, develop and administer programs, which includes management of program budgets, oversight of the RFP process and implementation contractor, program development, program coordination and general overhead expenses.

Program Implementation: Program delivery costs associated with implementing the program - includes implementation contract labor and overhead costs, as well as other direct program delivery costs.

Program Marketing: Expenses related to program marketing and increasing DSM consumer awareness (direct program marketing costs as opposed to general consumer education).

Rebates and Incentives: Money allocated for customer rebates and incentives, installation of low income weatherization and low income bill assistance.

Spillover: Refers to indirect energy impacts of the program and estimated savings from customers who implement energy-efficient savings strategies as a result of knowledge of APS's program but who do not receive an incentive through the program.

Training and Technical Assistance: Cost of EE training and technical assistance.

IV. Residential Energy Efficiency Programs

1. Consumer Products Program

Introduction

The Consumer Products Program is made up of two elements – Residential Lighting and Residential Pool Products. The Residential Lighting element of the program promotes high-efficiency ENERGY STAR® Compact Fluorescent Light Bulbs (“CFLs”) and Light Emitting Diodes (“LEDs”). CFLs and LEDs use an average of 75%-90% less energy than standard incandescent bulbs and last up to twenty-five times longer, typically saving consumers between \$35 - \$80 in energy costs over the life of each bulb. The program offers discounts on CFLs and LEDs through cooperative agreements with retailers and lighting manufacturers. This provides consumers with reduced retail prices on energy efficient lighting at local retailers.

As part of the Program, APS also offers CFL recycling in partnership with participating retailers and Veolia Environmental Services, which operates a recycling facility in Phoenix. Customers may take their burned out CFLs to participating retail locations (including select Ace, True Value and Home Depot stores) throughout the APS service territory for free recycling.

The Energy-Efficient Pool Pump element of the Consumer Products program is designed to improve residential pool operations while saving energy and maintaining equivalent or better standards for pool sanitation and cleanliness. The program promotes the installation and optimal calibration of energy-efficient variable-speed pool pumps with a rebate of \$220 per pump.

Program Goals and Objectives - Lighting Program

The goal of the lighting program is to promote the purchase of high-efficiency, ENERGY STAR® rated CFLs and LEDs, while increasing awareness on the benefits of ENERGY STAR® rated lighting products.

The goal of the Energy-Efficient Pool Pump program element is to promote the purchase of high-efficiency ENERGY STAR® variable-speed pool pumps. In a typical Arizona home with a pool, the pool pump energy use can make up a substantial portion of annual energy use, often second after heating and cooling costs.

Table 14 - Consumer Products Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
12.1	100,490	769,120

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Level of Program Participation

During this Reporting Period, the energy-efficient lighting element of the program resulted in sales of 1,835,053 CFLs and 709,979 LEDs through participating retail locations. In addition, APS distributed 120,757 CFLs during community outreach events, for a combined total of 2,665,789 CFLs and LEDs during 2015. Approximately 260 retail outlets participated

in the lighting program throughout APS' service territory, including: Ace Hardware, Costco, Dollar Tree, Goodwill Industries, Home Depot, Lowe's, Sam's Club, Target, and Wal-Mart.

The Pool Pump program element provided rebates for 5,116 variable-speed pool pumps purchased by customers during this Reporting Period and currently includes over 200 participating pool retailers, distributors, and pool builders. During this Reporting Period, 9 pump calibration training seminars were held with a total of more than 1116 pool professionals trained. In addition, program representatives routinely conducted retail visits to inform pool professionals and provide updates regarding the APS rebate program.

Evaluation/Monitoring Activities and Research Results

- Updated incremental material cost and avoided incandescent replacement cost assumptions for CFL and LED measures offered.
- Initiated research regarding the number of CFLs and LEDs being sold and installed in commercial building applications.
- Adjusted incremental material cost and O&M cost savings for variable speed pool pumps, based on a mix of manufacturer and pump sizes derived from the implementation tracking data.
- Observed and provided process improvement feedback on pool pump calibration training for participating trade allies.
- Continued to review and update CFL, LED and Pool Pump, Measure Analysis Spreadsheets and Analytic Database.
- Analyzed and characterized new measures for potential inclusion in CPP portfolio including: smart thermostats, heat pump water heaters, and ENERGY STAR® appliances.

Consumer Education and Outreach

The program conducted retailer visits and retailer trainings during the Reporting Period to educate retail sales staff, assess inventories of merchandise, check point of purchase displays, address availability of qualified product, and communicate with retail sales staff.

In addition to the bulb sales at retail locations, APS has purchased a supply of CFLs to use for the low income program and for customer education and awareness building purposes.

APS supported 190 community education and customer outreach events during this reporting period to promote the Consumer Products programs and educate customers about APS programs, rebates, and opportunities for saving energy and money. For a comprehensive list of events and dates, please refer to the work-papers provided to ACC Staff.

Advertising and article placements for the Lighting program element included the following:

- Updated the "Lighting Savings Calculator" to include LEDs, available at: www.aps.com/main/various/CFL/calculator.html?source=hme or aps.com/calculator providing customers a way to predict the savings they could achieve by switching to energy efficient lighting. The calculator provides recommendations for which type of lighting should be used to replace each bulb in the home and then the tool will either email or print out a customized shopping list.
- Created a video to explain how to select and purchase LEDs and CFLs for your home.
- LED radio spots aired August through September on local radio stations.

- Information on aps.com including a listing of all participating retail locations and a retail locator function that shows the closest stores throughout the service area based on entering a zip code.
- Articles in the Lifestyles Residential newsletters/e-newsletters: February, April, June and August.
- Point of sale signage at participating Lighting and Pool retail locations.
- Produced three bill inserts with three different calls to action that went out to customers in January, March, May, and September highlighting APS discounted CFLs and LEDs.
- Held 22 days of staffed Costco retail events in October throughout the metropolitan area service territory resulting in increased sales and awareness.
- A significant digital marketing presence was implemented August through September providing additional awareness.
- Sent geo-targeted lighting messaging through social media to promote retail events August through September.
- Ran print ads in the Yuma, Flagstaff, Casa Grande and Prescott Valley markets highlighting weekend LED promotion events at the local Costco and Home Depot stores.

In addition, the program conducted a wide range of marketing and advertising activities to raise awareness about variable-speed pool pumps including:

- Provided program brochures for consumers at outreach events.
- Direct mail campaign to target market of pool customers in September.
- Maintained program web pages on aps.com including basic information, online application forms, video content, answers to frequently asked questions, and a list of participating Pool Retailers.
- Produced collateral for point-of-sale materials, including many different styles and sizes of store signage.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

During this reporting period, LED giveaway Light bulbs were approved for this program per Commission Decision No. 74406. The same Commission Decision provided the ability to reduce incentive levels and subsequently APS reduced rebate for variable speed pool pumps from \$270 to \$220 per unit. No other program or measures were modified or terminated.

Other Significant Information

The US EPA ENERGY STAR certification was incorporated as part of the required minimum criteria for qualifying eligible variable-speed pool pumps to participate in the program.

MER Adjusted Gross MW and MWh Savings

Table 15 - MER Adjusted Gross MW and MWh Savings - Consumer Products Program

Measure	# Units	Annual Gross MWh Savings**	Lifetime Gross MWh Savings**	MW Peak Demand Savings**
CFLs - Retail*	1,835,053	55,784	390,487	6.4
CFLs - Giveaway	120,757	3,792	26,541	0.5
LEDs	709,979	29,684	445,265	3.1
2015 In-Service CFLs	NA	12,491	0	1.2
2X Incandescent***	0	0	0	0.0
Variable Speed Pool Pumps	5,116	8,993	107,912	0.4
TOTAL	2,670,905	110,744	970,205	11.6

*The total number of units is adjusted for 1) bulbs not yet placed into service 2) bulbs installed outside APS territory. Please refer to workpapers for the complete list of units in this reporting period.

**Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

***2x Incandescent bulbs are an approved measure, but there was no program activity in this reporting period due to a lack of product availability.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

Benefits and Net Benefits, Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

2. Appliance Recycling Program

Description

The program educates APS customers regarding the energy savings that can be achieved by recycling their old, operating, extra refrigerator or freezer. These appliances use a great deal of energy and by turning those in for recycling, customers can save up to \$100 per year on their electric bill. This program provides customers an incentive to remove old, inefficient appliances from the grid.

APS customers with an old operating extra refrigerator can receive a \$30 rebate with free pick-up service at the customers' convenience that can be scheduled either online at aps.com/turnitin or by calling toll free 877-514-6654. APS partners with JACO Environmental, Inc. to provide the free pick up and recycling service.

Program Goals, Objectives and Savings Targets

The program objective is to educate APS customers that their second older, working refrigerator or freezer in the garage or laundry room is costing them an additional \$100 per year in energy costs to operate. Refrigerators and freezers today are much more energy-efficient than models built prior to 1993, with models sold today using about 1/3 the energy of older units.

Table 16 - Appliance Recycling Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
1.6	11,360	68,150

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

During this Reporting Period, APS recycled 6,819 refrigerators and freezers. Units were picked up across APS's service territory statewide.

Evaluation/Monitoring Activities and Research Results

- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database.
- Continued review of implementation program tracking database.

Consumer Education and Outreach

- Program marketing efforts during this Reporting Period include the following:
 - Bill inserts – February, May, June and August.
 - Newsletter article – March, April, July, September and October.
 - Segmented direct mail campaign launched in August.
 - Targeted email letter campaign that dropped during the month of August.
 - Geo-targeted Facebook campaign that ran May through June.
 - Radio advertising during the month of August.
 - A significant digital marketing presence was implemented July through September providing additional participation and awareness.

Problems Encountered and Proposed Solutions

During this Reporting Period, JACO Environmental (JACO), the third party contractor responsible for implementing the appliance recycling program for APS, formally went into Receivership and discontinued operation in Arizona without notice to APS on November 23, 2015. APS suspended the appliance recycling program at that time.

Program Modifications/Terminations

After JACO discontinued operations, APS evaluated its options, including engaging in discussions with another appliance recycling company. Based upon the pricing information APS received, APS has determined that the program will not be cost effective moving forward. This program will be suspended indefinitely in 2016.

MER Adjusted Gross MW and MWh Savings

Table 17 - MER Adjusted Gross MW and MWh Savings - Appliance Recycling Program

Measure	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Refrigerators	6,099	7,644	45,866	1.1
Freezers	720	729	4,377	0.1
TOTAL	6,819	8,373	50,243	1.2

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c). Commission Decision No. 73089 requires APS to report spending for non-EE measures in the Appliance Recycling Program. There were no non-EE measures or associated spending in this program during this Reporting Period.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

3. Residential New Home Construction

Overview

This program promotes high-efficiency construction practices for new homes. It offers incentives to builders that meet the program’s EE standards. The program emphasizes the whole building approach to improving EE and includes field testing of homes to ensure performance. Participating builders are trained to apply building science principles to assure that high efficiency homes also have superior comfort and performance. The program also provides education for prospective homebuyers about the benefits of choosing an energy-efficient home and the features to consider.

The program takes advantage of the national ENERGY STAR® brand name, and promotes the U.S. Environmental Protection Agency (“EPA”) ENERGY STAR® label to prospective homebuyers. To encourage builders to meet the program’s high-efficiency standards, APS provides builder incentives of \$600 per home for ENERGY STAR® version 3 compliant homes. To encourage builders to meet even higher EE standards, the program also offers a second tier incentive of \$1,500 per home for builders that meet the higher savings level of Home Energy Rating System (“HERS”) 60.

Program Goals, Objectives and Savings Targets

The program objective is to increase the penetration of homes built to high-efficiency standards. The rationale for this program is that residential new construction in the APS service territory, particularly the Phoenix metro area, has historically been one of the biggest drivers of APS’s system load growth. It is more cost-effective to work with builders to implement EE at the time of construction rather than to attempt to retrofit efficiency after a home has been built. For many new home measures, such as building envelope improvements, the benefits of EE upgrades will be sustained for the life of the home to produce cost-effective savings.

Table 18 - Residential New Construction Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
4.15	10,860	217,227

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

At the end of this Reporting Period, there were 67 homebuilders and 390 subdivisions currently participating. The program currently includes ENERGY STAR® communities throughout the APS service territory including the Phoenix metro area, Yuma, Casa Grande, Florence, Prescott, Verde Valley, and Flagstaff.

Specifically, in 2015 APS paid builder incentives for the following completed homes:

- 3,713 ENERGY STAR Version 3
- 1,066 ENERGY STAR Version 3 – HERS 60

Evaluation, Monitoring, Administration, and Research Results

- Interviewed HERS Raters in October 2015, to identify program opportunities and overall program satisfaction.
- Developed and re-calibrated energy simulation models based on most recent program participants billing records, building characteristics, and HERS scores.
- Initiated calibration of non-participant energy simulation models based on non-participant billing records, climate zones, and square footages.
- Updated baseline efficiency assumptions and energy savings impacts for non-participant homes based on new building code adoptions across all APS jurisdictions.
- Continued to review and update Residential New Construction Measure Analysis Spreadsheets and Analytic Database.

Consumer Education and Outreach

Program marketing and education efforts during this Reporting Period include the following:

- *Television* – APS developed and aired a new ENERGY STAR homes TV spot for New Home Source TV that aired on channel 3. The hosted segments tout the energy savings and benefits of ENERGY STAR homes.
- *Online Ads* – APS developed banner ads that ran all year on newhomesource.com. Newhomesource.com is one of the most used web resources for customers searching for new homes listings and information on local builders.
- *Realtor Publication* – Monthly publication lists all new home communities and homes for sale in the metro Phoenix area. APS advertising includes banner ads highlighting all participating ENERGY STAR communities.
- *2015 Homebuilders Association Member Directory* - the back cover ad to promote the APS ENERGY STAR® Home program to builders
- *Provided Sales Agent Training* - for APS ENERGY STAR® Home builder sales staff.
- *Distributed APS ENERGY STAR® Home Program Sales Book* - for builder sales agents to use in selling the features of ENERGY STAR® Homes to prospective homebuyers.
- *Distributed APS ENERGY STAR® Model Home Materials* - for builders to put in model homes to advertise the different features and benefits of an ENERGY STAR® homes.
- *Distributed a homebuyer brochure* - that is targeted to new buyers and discusses the features and benefits of an ENERGY STAR® home. The brochures are being distributed at community events and at participating builders' model home sales offices.
- In October, APS participated in the Southwest Builder Show trade expo and met with builders, HERS raters, and other industry partners.

Programs, Initiatives, and Proposed Solutions

As municipalities continue to adopt increasing energy efficiency requirements in their residential building codes, there is less savings available for homes built to current ENERGY STAR requirements. APS will monitor this situation in 2016 and propose program modifications as needed.

Program Modifications, Terminations

No program modifications were made during this reporting period.

Other Significant Information

In recognition of the ongoing success of the APS EE program portfolio and the APS ENERGY STAR® Homes and Home Performance with ENERGY STAR Programs, APS was selected by EPA as a 2016 ENERGY STAR® Partner of the Year, Sustained Excellence Award winner. This is the highest award that can be earned by an ENERGY STAR® partner, and is bestowed on partners who show sustained excellence in their commitment to EE and whose organization is a national model of best practices in advancing EE. APS has now earned ENERGY STAR® awards for ten consecutive years.

MER Adjusted Gross MW and MWh Savings

Table 19 - MER Adjusted Gross MW and MWh Savings - Residential New Construction Program

Measure	# Units	Lifetime		
		Annual Gross MWh Savings	Gross MWh Savings	MW Peak Demand Savings
APS ENERGY STAR Homes V3	3,713	7,721	154,415	4.0
APS ENERGY STAR Homes HERS60	1,066	3,536	70,725	1.8
TOTAL	4,779	11,257	225,140	5.8

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

In addition, program consumer education and homebuilder training efforts produce significant additional energy savings and benefits that are not quantified here.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

4. Residential Existing Homes Heating, Ventilation, & Air Conditioning Program

Description

The Residential Existing Homes Heating, Ventilation, and Air Conditioning Program ("Residential HVAC") uses a combination of financial incentives, contractor training and consumer education to promote the proper installation and maintenance of energy-efficient HVAC systems. The Air Conditioner ("AC") Rebate, Duct Test and Repair, Prescriptive Duct Repair and Residential Diagnostic measures support energy-efficient Residential air conditioning and heating systems along with the proper installation, maintenance and repair of these systems.

The Residential Existing Homes HVAC program provides APS customers with referrals to contractors who meet strict program requirements for professional standards, technician training, and customer satisfaction.

The AC Rebate with Quality Installation ("QI") measure offers financial incentives to homeowners for buying energy efficient HVAC equipment (≥ 13 SEER/10.8 EER), that is installed in such a manner that it meets the program requirements for air flow, refrigerant charge and sizing. The Duct Test and Repair ("DTR") measure provides financial incentives to customers for having their HVAC system's duct work tested for leakage and repaired. The Prescriptive Duct Repair ("PDR") measure provides financial incentives to customer for having the HVAC system sealed to reduce are leakage. It does not require a full test in and test out of the HVAC system like the DTR measure. APS also has a Residential Diagnostic ("RD") measure to provide a financial incentive for an advanced diagnostic tune-up on existing air conditioning and heat pump equipment to ensure that it operates more efficiently. The main components of this measure are the correction of the refrigeration charge, leak repair, condenser coil cleaning and air flow verification.

Program Goals, Objectives, and Savings Targets

The Existing Homes HVAC program uses a combination of financial incentives, contractor training and consumer education to promote high-efficiency HVAC systems. The program focuses on the proper installation of equipment, increasing existing equipment efficiency, and the testing, sealing and repair of duct work in existing Residential homes.

Table 20 - Existing Homes HVAC Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
10.1	14,750	182,140

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

- A total of 18,213 rebates were paid through the HVAC element of the program in 2015. APS has paid:
 - Quality Installation: 10,590 of the \$245 AC rebates for all SEER/10.8 EER equipment
 - HVAC Advanced Diagnostics: 616 of the \$100 Residential Diagnostic rebates.
 - Duct Test and Repair participation levels in 2015:
 - 6,987 DTR reported rebates. There were 7,260 total rebates, 273 were for tests without repairs. Only the repair (6,987) rebates are

used for calculating the demand and energy savings shown in the savings tables.

- There were 20 Prescriptive Duct Repair rebates.
- There are currently 137 contractors that can offer the APS AC Rebate of which 110 are APS Qualified Contractors. There are 27 Rebate Eligible contractors that entered the program through the application process approved by the ACC in October 2009, which does not require membership in the Arizona Heat Pump Council. There are currently 22 contractors that can offer the rebates outside the Phoenix metropolitan ("metro") area.
- There are currently 52 active Duct Test and Repair contractors. There are 11 contractors that can provide the rebate outside of the Phoenix metro area.

Evaluation and Monitoring Activities and Research Results

- Assessed program processes through on-site "ride alongs" with duct test and repair contractors on single family and mobile home projects.
- Surveyed HVAC contractors regarding pressure balancing practices and costs to determine incremental impact of pressure balancing and total enclosed static pressure measurements on overall energy savings, HVAC system efficiency, and cost-effectiveness for the duct test and repair program.
- Surveyed HVAC contractors regarding federal efficiency standards for HVAC equipment and impacts on stocking and selling practices.
- Conducted a billing records regression analysis of single family duct test and repair participants.
- Conducted an evaluability assessment of performance data collected for multi-family duct test and repair jobs.
- Continued to review and update Residential HVAC Measure Analysis Spreadsheets and Analytic Database including Quality Installation, Duct Test and Repair, Prescriptive Duct Repair, and Advanced Diagnostic Tune Up measure offerings.
- Characterized the energy and demand impacts and incremental measure costs of the Western Cooling Control for consideration as a potential future measure in this program.

Consumer Education and Outreach

Residential Existing Home HVAC program marketing and consumer/contractor education efforts for this Reporting Period include:

- Articles in APS FYI Newsletter for March (Residential Diagnostic), June (AC), August (AC), September (DTR) and November (DTR).
- Targeted Direct Mail and/or E-mail campaign for March (Residential Diagnostic), May (Residential Diagnostic), July (AC), and September (DTR).
- Facebook ads in January (DTR), February, (DTR), March (Residential Diagnostic), April (Residential Diagnostic), May (Residential Diagnostic), July (AC), August (AC), September (DTR), October (AC, DTR) and November (DTR).
- Online Banner Ads and search engine marketing (SEM) in April (Residential Diagnostic), May (Residential Diagnostic), June (AC), July (AC), August (AC), September (DTR), October (AC, DTR) and November (DTR)..

- Presentations on the APS Residential DSM programs to numerous community groups. Most of the consumer education events listed under Consumer Products also include information on the AC Rebate and other APS Residential programs.
- The aps.com homepage prominently features APS EE programs. These programs are grouped in one section of the homepage entitled "Save Energy and Money."

Problems Encountered and Proposed Solutions

No major problems were encountered during this Reporting Period.

Program Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

MER Adjusted Gross MW and MWh Savings

Table 21 - MER Adjusted Gross MW and MWh Savings - Existing Homes HVAC Program

Measure	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
AC with Quality Installation	10,590	10,049	100,491	5.6
Diagnostics	616	348	2,087	0.2
Duct Test and Repair	6,987	7,824	140,827	8.2
Prescriptive Duct Test and Repair	20	11	193	0.0
TOTAL	18,213	18,232	243,598	14.0

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

** Duct Test and Repair # units shows only rebates paid for repair work. Rebates paid for duct tests only are not included.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

5. Home Performance with ENERGY STAR®

Introduction

The Home Performance with ENERGY STAR program promotes a whole house approach to energy efficiency by offering incentives for improvements to the building envelope and mechanical systems of existing Residential homes within the APS service territory. HPwES includes measures that improve the EE of the home with air sealing, insulation and duct sealing.

The program offers home owners a \$99 comprehensive home energy checkup to help identify ways to improve energy efficiency and comfort throughout the home. This program element offers a direct install feature that includes up to ten CFLs and LEDs, and one low-flow showerhead that are installed at the time of the checkup. Additional financial incentives are available for duct sealing, air sealing, and insulation once a home owner has completed an HPwES checkup. After measures are installed, rigorous testing and quality assurance protocols then verify installation quality and performance.

Program Goals, Objectives and Savings Targets

The HPwES measures promote a whole house approach to EE by offering education, technical assistance and financial incentives for improvements to the building envelope of existing Residential homes within the APS service territory.

Table 22 - Existing Homes - Home Performance Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
2.56	3,947	61,418

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

During this Reporting Period:

- A total of 3,767 contractor incentives were paid through HPwES for completed and approved energy audits. Each home that received a \$99 home energy audit, also received a direct install bag containing one low-flow showerhead and ten 13 watt compact florescent light bulbs (CFLs).
- The APS HPwES program paid rebates for measures installed in 1,450 participating homes. This indicates an approximate 39% of homes that completed an audit during the Reporting Period took steps to install additional measures as a result of the audit. The total number of customer rebates paid was 2624. Specifically, APS has paid:
 - 1,669 duct sealing and repair rebates.
 - 43 air sealing and insulation rebates.
 - 955 insulation only rebates.
 - 9 Air sealing only rebates
- 2015 was the first full year that Smart power strips were utilized. Smart power strips provide EE savings by intelligently controlling home electronics to reduce energy wasted in standby mode. In the program, smart strips are offered to customers who

proceed with energy saving improvements identified in their Home Performance energy audit. A total of 1,450 Smart power strips were deployed.

- There are currently 36 qualified HPwES contractors. Contractors must complete the Building Performance Institute's Building Analyst certification and undergo a mentorship prior to becoming active. HPwES currently serves Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, Yavapai, and Yuma counties. We continue to promote contractor participation in underserved areas to promote choice for our customers.
- During this reporting period, the APS Home Performance answer line received 1,264 referral inquiries by telephone.

Evaluation/Monitoring Activities and Research Results

- Refined savings estimates for behavioral tips provided through the Energy Analyzer based on the frequency tips were presented to users and user self-reported data regarding implementation of recommended energy efficient behaviors. Provided design assistance to ensure systems are in place to collect data and make it available for evaluation of potential energy savings resulting from behavioral tips.
- Continued review of program tracking databases and provided guidance on structuring data exports of participant audit data containing building characteristics, including insulation levels, blower door test results, window types, HVAC system type and efficiency, to support annual savings analysis and verification process.
- Developed and re-calibrated energy simulation models based on most recent program participants billing records, building characteristics, and installed weatherization measures.
- Conducted a regression analysis of participant and non-participant billing records for comparison with savings based on energy simulation modelling as well as savings calculated through Optix Quantify software.
- Characterized potential new measures including LEDs and Water Heater Wrap.
- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database.

Consumer Education and Outreach

HPwES marketing and consumer/contractor education efforts for this Reporting Period include:

- Utilized the Energy Analyzer online audit tool on aps.com and social media channels as a lead generator for the HPwES program. Educated customers on how their home uses energy and what energy efficiency program recommendations are available to them. When customers receive a recommendation to consider an on-site energy audit, customers can apply immediately from the results page to enter into the HPwES program and receive contractor referrals.
- From initial engagement to project completion, APS provides customers with a simple, streamlined process to help guide them- including a "My Project" dashboard that helps track their project status, review program documents and receive digital coaching throughout their program participation.
- Employed search engine marketing (SEM) and digital ads to better target customers actively searching for ways to improve their energy efficiency.

- Continued with a "hometown" concept for homeowners that match them with one contractor whose service area includes their hometown. This feature was designed to eliminate confusion for customers looking at an entire list of contractors. The new referral tool now captures the contractors' bio, website link, BBB profile and logo for a more thorough description.
- Distributed HPwES brochures through community events, trade allies, contractors, and other industry partners.
- Executed trigger based direct email communications to customers with a high propensity to participate in the program.
- Using the APS call center, we held a call center campaign to promote home energy checkups to qualified customers that called during the summer months. A script is now used by call center associates during high bill calls to promote the program.
- Maintained the aps.com/checkup program page and continued to make it more customer friendly. A stand-alone website is available at www.azhomeperformance.com.
- Placed articles in: APS newsletter and e-newsletter for February, May, and December, for Home Performance specifically. And March, July and a larger promotion that began in September for Energy Analyzer called the "30-Day Challenge"
- Delivered presentations on the APS Residential DSM programs to numerous community groups. Most of the consumer education events listed under Consumer Products included information on the HPwES and other APS Residential programs.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

The Smart power strips measure was removed from the program as of December 31st 2015 due to low interest from customers and contractors.

In 2015, Navigant performed MER analysis on the Energy Analyzer software utilized to provide behavioral tips in the HPwES program. The MER findings indicate that savings are being realized as a result of the behavioral changes recommended in Energy Analyzer. Therefore, Navigant recommends that APS begin claiming the savings realized through the Energy Analyzer through the HPwES program at the earliest opportunity. Please see the 2015 MER report completed by Navigant that demonstrates these savings.

APS continues to lead the Home Performance with ENERGY STAR[®] program nationally as a leader in the implementation of the national data standards (BPI 2100 and BPI 2200), otherwise known as HPxML. This advance offers flexibility for participating contractors, allowing them to choose their preferred energy modeling software tool, while still giving APS access to robust reporting and data collection in a standardized format. In this program environment contractors have their own choice in modeling and customer education tools, allowing them to work more quickly in the field. As a result, contractors have decreased their administrative time per job by reducing time spent filling out paperwork, submitting rebate forms, tracking rebates, etc., which directly reduces project costs while improving contractor satisfaction. Contractors report they have more control over the reports each customer receives as part of their energy audit, which leads to better interactions with customers to educate them on the best ways to save energy in their homes. APS will

continue to explore how the additional data gained in this system better informs marketing efforts to refine customer acquisition strategies.

Other Significant Information

The Home Performance with ENERGY STAR® program is a valuable program to assist residential customers in improving the energy efficiency of their homes and in supporting a local network of home performance contractors who can help deliver efficiency services. The program is a driver for customers to participate in energy efficiency and often customer's first experience and entry point with APS when trying to diagnose high bill concerns or comfort problems inside their home. By channeling customers into the program, we are able to provide important services and education to help rate payers manage their bill and provide solutions. In addition to electric energy savings the program also generates significant additional savings for customers such as health and safety and indoor air quality.

In recognition of the ongoing success of the APS EE program portfolio and the APS Home Performance with ENERGY STAR® and ENERGY STAR Homes Programs, APS was selected by the EPA as a 2016 ENERGY STAR® Partner of the Year, Sustained Excellence Award winner. This is the highest award that can be earned by an ENERGY STAR® partner, and is given to partners who show sustained excellence in their commitment to EE and whose organization is a national model of best practices in advancing EE.

APS works closely with other utilities in the state to coordinate the delivery of HPWES statewide. In 2015, APS continued to work closely with Salt River Project as we coordinate program delivery to optimize delivery across both electric service territories. This coordination allowed us to further ensure market consistency, while enhancing the customer experience through a joint program delivery.

Other Information on EE and MWh Savings

Table 23 - MER Adjusted Gross MW and MWh Savings - Existing Homes - Home Performance

Measure	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Direct Install Low Flow Showerhead	3,767	254	2,545	0.0
Direct Install CFLs	37,670	722	4,332	0.1
Direct Install Smart Strips	1,450	301	1,204	0.0
Duct Repair	1,669	1,595	28,708	1.8
Air Sealing	9	10	150	0.0
Air Sealing and Attic Insulation	955	1,064	24,479	0.6
TOTAL	45,520	3,947	61,418	2.6

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

In addition to the savings shown above, HPWES conducts a number of market transformation efforts, such as contractor training and customer education activities designed to transform the EE market. This results in spillover which produces additional energy savings and net benefits which are not quantified here.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

6. Residential Conservation Behavior Program

Description

The Residential Conservation Behavior Program provides participating Residential customers with periodic reports containing information designed to motivate them to change their energy usage behavior to save energy.

To drive conservation behavior, this program direct mails comparative Home Energy Reports to participants that show how the energy usage in that customer's home compares with similar homes. Coupled with the comparison data, customers receive recommendations for specific and targeted actions they can take to save energy.

Derived from best practices in behavioral science research, this program uses the power of normative messaging to successfully engage and motivate conservation actions of targeted individuals. Comparing an individual's energy use to what is "normal" has proven to be an effective mechanism to attract attention and motivate action. Normative messaging on energy use, combined with recommendations on how to improve, is the basis of the concept for the Conservation Behavior program. The program provides a benchmark for customers to achieve and instills a sense of competition to produce sustained conservation behaviors.

Program Goals, Objectives, and Savings Targets

The goal of this Program is to motivate Program participants to save energy by changing their energy use behavior.

Table 24 - Conservation Behavior Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
10.8	52,420	52,420

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

The 2015 program targeted an average of approximately 261,000 residential (both single and multi-family) customers with a control group average of approximately 62,000 additional customers. In February 2015, approximately 200,000 customers were added to the program. The highest monthly customer count for the year was 295,519. Customers were able to "opt out" of the program at any time. One thousand five hundred twenty four (1,524) participants opted out of the program in 2015.

Evaluation, Monitoring Activities and Research Results

- Validated that customers added to the program in 2015 are consistent with a Randomized Controlled Trial, as required to support evaluation of program savings.
- Conducted statistical analysis of monthly billing records to verify implementation contractor model savings estimates.
- Continued to review model employed by implementation contractor to assess accuracy and reasonableness of model outputs.
- Conducted a literature review on persistence of behavioral-based program savings to assess impact on program cost-effectiveness.

- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database.

Conservation Education and Outreach

Participants receive periodic, direct mailed reports that provide energy usage benchmarks and customized energy efficiency tips to educate and help them reduce consumption. Participants also have access to a web portal that provides even greater insight into usage, comparisons (both personal and with similar homes) and a plethora of energy savings tips.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

Approximately 200,000 customers were added to the program in 2015.

In 2016, APS will explore layering on email reports on top of printed reports for aps.com activated program participants to increase the cost effectiveness of the program.

Additionally, APS will test event-based messaging to approximately 47,000 report recipients with the specific goal of achieving peak demand reductions and added energy efficiency savings during the highest system peak days of the year. Within 24 hours preceding a day during which system demand is expected to peak, APS will send selected customers a communication via e-mail or voice recording) informing them that demand for energy is likely to be high the following day during the specified hours. Customers will be asked to reduce their energy usage during those hours and household-specific tips will be provided. Within a few days after the peak event, customers will receive feedback informing them how much they reduced their usage during the event compared to their neighbors in similar dwellings. By drawing on the same behavioral principles that have proven successful at driving energy efficiency savings, APS will test whether such tactics can be targeted during specific times of peak demand in order to achieve increased energy savings and maximize the impact on peak capacity needs.

Other Significant Information

In addition to conservation behavior savings, one of the key benefits of this program is that it promotes the wide array of APS rebate programs in the tips offered on each report.

MER Adjusted Gross MW and MWh Savings

Table 25 - MER Adjusted Gross MW and MWh Savings - Conservation Behavior Program

Measure	# Participants	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Conservation Behavior Program	261,156	57,444	57,444	12.0
TOTAL	261,156	57,444	57,444	12.0

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

7. Prepaid Energy Conservation Program

Description

The Residential Prepaid Energy Conservation Program ("Prepay Program") is a 'pay as you go' program that provides participants with energy efficiency and conservation information to help them better understand and manage their electric utility budget. Customers periodically prepay for electric service in lieu of paying a monthly bill. APS provides participating customers with frequent feedback on the balance in their prepaid energy account via text, email and/or phone call alerts to assist them in managing their energy consumption. This combination of energy information/education and direct feedback on energy spend is a powerful tool that helps participating customers save energy and reduce energy costs.

Program Goals, Objectives, and Savings Targets

The goal of this Program is to motivate Program participants to save energy by providing frequent cost feedback.

Table 26 - Prepaid Energy Conservation Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
0.5	2,640	2,640

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Level of Customer Participation

1,525 customers participated in the 2015 Prepaid Energy Conservation Program based on an annual average. The highest average monthly customer participation was 1,627 in both April and May. The lowest average monthly customer participation was in December with 1,360 customers.

Evaluation/Monitoring Activities and Research Results

- The estimated energy savings for Prepay Program participants was revised to produce a more accurate estimate of energy reductions due to service disconnects based on analysis of a larger population of program participants than the original analysis. The revised analysis then removed disconnect effects from the estimated energy savings for Prepay. (see Appendix A).
- Continued to review and update program Measure Analysis Spreadsheets.

Consumer Education and Outreach

The Program was primarily promoted through the APS call center to Customers that met the eligibility requirements. Upon enrollment, APS sent participants a welcome packet that included the Prepay Program Guidelines, the Prepay Service Agreement, brochure on how the program works and information on how to save energy with APS Prepay.

Customers have 24 hour, 7 day access to their account balance by calling the APS automated phone system, speaking with an associate or checking their aps.com 'My Prepay' web portal. APS provides customer cost feedback by sending proactive alerts to help customers manage their account balance.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

Commission Decision No. 75323 (November 15, 2015) authorized APS to suspend this Program by December 31, 2016, APS is transitioning to a new billing system by early 2017 and will reevaluate the Prepay program after that time.

Therefore, APS will not be actively promoting the program to Customers in 2016. Customers who meet the minimum eligibility requirements will be allowed to enroll in the Program and will be informed of the Program suspension date of December 31. In the early Fall, APS will notify all active Program participants of the suspension and will begin transitioning Customers to standard billing before year end.

Other Significant Information

In addition to conservation behavior savings, one of the key benefits of this program is that it allows customers to have more control over their monthly utility costs.

MER Adjusted Gross MW and MWh Savings

Table 27 - MER Adjusted Gross MW and MWh Savings - Prepaid Energy Conservation

Measure	# Customers	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Prepaid Energy Conservation	1,525	1,929	1,929	0.4
TOTAL	1,525	1,929	1,929	0.4

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Reported savings for the Prepaid Energy Conservation Program are attributed directly to the energy management actions taken by participants and have been adjusted to remove the effect of disconnections. Savings reported during this Reporting Period are based on the revised disconnect analysis completed by Navigant where deemed savings are 1,182 kWh (7.168% of average annual usage) per participant per year. The number of participants reported is the annual average number of participants. The updated Navigant analysis can be found in Appendix A.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

8. Multifamily Energy-Efficiency Program

Description

The Multifamily Energy Efficiency Program ("MEEP") is a program that encourages EE improvements in multifamily complexes within the APS service territory. The MEEP received ACC approval in Commission Decision No. 72060 (January 6, 2011).

MEEP uses a three-track approach to promote EE within the multifamily market segment.

- **Track 1** Provides free direct install components to retrofit the Residential dwellings of existing communities. Participating communities receive enough CFLs, low flow showerheads, and faucet aerators to retrofit every community dwelling. Facility personnel, with implementation contractor field support, conduct all direct install installations.
- **Track 2** Provides complementary energy assessments of the community commercial facilities. The energy assessment identifies opportunities for additional EE savings and the applicable Solutions for Business incentives that are available.
- **Track 3** Targets new construction and major renovation multifamily projects. This track builds from the success of the APS ENERGY STAR® New Homes program and encourages energy efficient building principles by paying an incentive to builders on a per unit basis for building to the energy efficiency standards outlined in one of three builder option packages ("BOP"). Larger incentives are offered for achieving increasingly higher levels of energy efficiency.

Program goals, objectives, and savings targets

The MEEP program objectives are to:

- Reduce peak demand and overall energy consumption in the multifamily housing market segment.
- Promote existing community EE retrofits of both dwelling units and common areas.
- Promote higher efficiency construction standards in the development of new multifamily projects.
- Increase overall awareness about the importance and benefits of EE improvements to the landlord and property ownership community.

Table 28 - Multi-Family Energy Efficiency Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
0.9	8,886	110,004

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Level of Customer Participation

A total of 102 multifamily properties participated in the direct install program totaling 17,048 apartment dwellings. All totaled 105,602 CFLs, 10,013 faucet aerators, and 5,849 showerheads were installed in multifamily dwellings during this reporting period.

The New Construction/Major renovation program saw 10 projects participate in this reporting period, and a total of 1,181 units received rebates in 2015.

Evaluation/Monitoring Activities and Research Results

- Initiated development of building energy simulation models and adjusted savings based on building characteristics, performance testing results, and customer billing records.
- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database.
- Characterized potential new measures including LEDs and Water Heater Wrap.
- Continued review of implementation program tracking database and supporting HERS rating documentation to refine savings assumptions.

Consumer Education and Outreach

MEEP consumer education and outreach efforts for this Reporting Period include:

- Distribution of MEEP brochures to customers.
- Direct Call and door to door outreach was utilized to get program messaging out in the market place and to secure many of the program's participants.
- Maintained a presence on aps.com to give customers a point of reference for all program information.
- Provided customer educational leave behind materials promoting EE in all dwellings that were retrofitted.
- MEEP presentations at community events.
- Offered a Success with Energy Star for Multifamily building training
- Developed and distributed Direct Install and New Construction case studies
- Developed a common area improvement program brochure
- Developed and distributed a promotional leave behind for residents to inform them of other APS EE program offerings
- Developed a commercial lender sell sheet to promote the program in the lender markets.
- Created a landing page for aps.com/meep designed to make it easy for customers to get immediate assistance with program enrollment.

MEEP marketing efforts for this Reporting Period include:

- Print ad in the Arizona Multifamily Association (AMA) Newsletter
- Print ad in the Arizona Rental Housing Journal (RHJ)
- Website Banner ad on the AMA website
- Direct Email to property managers
- Developed and distributed outreach savings kits that included samples of all direct install products.
- Developed and installed a car wrap to promote the program on the program utility vehicle.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications / Terminations

No programs or measures were modified or terminated during this Reporting Period.

MER New Construction Optional Measures Installed

In Commission Decision 73089, APS was directed to report the number and type of optional measures that builders/developers are choosing to install, as well as energy savings, coincident demand savings, and actual cost for each optional measure selected by Multifamily New Construction participants.

Ten Multifamily projects received rebates during this reporting period. All projects were rebated through the performance path. The performance path allows builders or developers of Multifamily new construction projects to use any building design to reach program compliance as long as the building's performance, when tested by a certified HERS rater, meets the minimum performance HERS scores standards established for each BOP. Thus performance path projects don't select optional items from the prescriptive list. Because neither project participated using the prescriptive path, there are no optional measures to report.

MER Adjusted Gross MW and MWh Savings

Table 29 - MER Adjusted Gross MW and MWh Savings - Multi-Family Energy Efficiency Program

Measure	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Direct Install Low Flow Showerhead	5,849	1,518	15,177	0.0
Direct Install Low Flow Faucet Aerators	10,013	473	4,729	0.0
Direct Install CFLs	105,602	4,063	24,379	0.6
Builder Option Package (BOP) 1	42	69	1,380	0.0
Builder Option Package (BOP) 2	0	0	0	0.0
Builder Option Package (BOP) 3	1,139	3,500	70,002	1.0
TOTAL	122,645	9,623	115,668	1.6

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Other Significant Information

No information to report at this time.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

9. Shade Tree Program

Description

The Shade Tree program provides free shade trees to APS's residential customers that have attended an APS Shade Tree workshop or participated in an online training. The program educates customers on successful tree planting and care techniques, and provides a customer specific site map indicating the ideal tree planting location(s) to help reduce customer cooling needs. Customers can qualify to receive between two (homes built after 1980) and three (homes built prior to 1980) free shade trees per residence. This program is available to residential customers in Maricopa County.

Program Goals, Objectives, and Savings Targets

The goal of this program is to encourage customers, through education and incentives, to plant shade trees in areas near their homes to reduce home cooling needs.

Table 30 - Shade Tree Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
0	0	0

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Level of Customer Participation

Not applicable

Evaluation/Monitoring Activities and Research Results

Not applicable

Consumer Education and Outreach

Not applicable

Problems Encountered and Proposed Solutions

The Shade Tree Program was found to not be cost effective at the end of program year 2014.

Modifications/Terminations

APS suspended the Shade Tree program in 2015 because it was not cost effective. APS evaluated the Shade Tree program with input from stakeholders and tested several potential program redesigns. APS was unable to develop a program model that would make the program cost effective.

Gross kWh and MWh Savings

Table 31 - MER Adjusted Gross kW and kWh Savings - Shade Tree Program

Measure	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Shade Trees	0	0	0	0.0
TOTAL	0	0	0	0.0

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

10. Energy Wise Limited Income Weatherization

Description

APS's Energy Wise Limited Income Assistance Program is designed to improve the EE, safety and health attributes of homes for customers whose income falls within the defined federal poverty guidelines. This program serves low income customers with various home improvements including cooling system repair and replacement, insulation, sunscreens, water heaters, window repairs and improvements as well as other general repairs. Per Commission Decision No. 68647, the program is conducted in accordance with the rules of the federal Weatherization Assistance Program ("WAP"). WAP incorporates a performance-based energy audit procedure that focuses on optimizing investment in energy efficiency through a systems approach. Participating agencies utilize a Department of Energy site specific REM Design energy audit procedure that ensures that the overall Savings to Investment Ratio ("SIR") for the entire package of materials/measures including the cost of incidental repairs is greater or equal to one. In addition, participating agencies also use a prescriptive priority list developed by the Arizona Department of Housing to determine which cost effective measures to install. There is also a multifamily housing component designed to extend the benefits of weatherization to these types of complexes. The program is administered by various community action agencies throughout APS's service territory.

Program Goals, Objectives, and Savings Targets

- To improve the EE of homes for customers whose income falls within the defined poverty guidelines.
- To provide customers information on energy management and conservation.

Table 32 - Limited Income Weatherization Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
0.2	1,440	25,930

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

A total of 723 households received assistance during the Reporting Period. A single household may have received more than one type of assistance.

Evaluation/Monitoring Activities and Research Results

Weatherization measures must pass the cost effectiveness test that is detailed in the federal government's Weatherization Assistance Program (WAP) rules. These rules allow certain prescriptive measures, which vary with the climate zone and type of housing construction. Measures not on the prescriptive list must be assessed by a computer analysis to determine the economic feasibility.

The Arizona Governor's Office of Energy Policy ("GOEP"), which has been incorporated into the Arizona Department of Housing, with information from APS, was analyzing the electric energy used in weatherized homes before and after the weatherization measures were implemented. It takes a year of data before the weatherization and another year of data after the weatherization to get an accurate gauge of the impact of the measures. As the data base grows over time, a more accurate picture of the impact of the weatherization activities will emerge.

The most recent information from the GOEP report is provided below:

Utility Bill Analysis

This report includes jobs completed across Arizona using data provided by APS, TEP, Unisource Gas and Electric and Southwest Gas utility data. This analysis is ongoing, new data will be updated to these values on a quarterly basis.

Provided are Savings to Investment Ratios (SIR) for total investment from all funding spent (diagnostics, energy measures and health and safety measures) and for energy related measure only (diagnostics and energy measures).

Assumptions

Present value is based on 17.5 years measure life, discount rate of 3% and a utility cost escalation rate of 3%.

Results Summary

The combined SIR of all jobs reviewed to date for funds (LIHEAP, DOE, Utilities, CDBG, URRD, SERC) spent on diagnostics, energy measures and health and safety measures is currently at 1.0. Health and safety represented 19% of expenditures.

The combined SIR of all jobs reviewed to date for funds spent on energy measures and diagnostics was 1.22

The average saving per home reviewed was 2270 kWh and 33 therms of natural gas (gas therms average includes all electric homes).

It should be noted that, GOEP study savings are based on an average of all homes located throughout the state that participated in the study. Due to changes in the GOEP, APS is currently working with Navigant to get specific information on average kWh savings for participating homes within APS's service territory.

Consumer Education and Outreach

Program marketing efforts and outreach included:

- Weatherization outreach and field visits to participating CAP offices
- Sponsored Weatherization Workshop with Red Feather on Hopi Nation
- Sponsored weatherization workshops with Red Feather in the Tuba City area for Navajo Nation customers
- Participated in Governor's Office of Energy Policy State Weatherization Policy Advisory Committee meetings for developing the D.O.E. State plan
- Attended Weatherization Peer to Peer meetings.

Problems Encountered and Proposed Solutions

Due to management changes at the Inter Tribal Council of Arizona (ITCA), which is tasked with providing weatherization services to Native American reservations served by APS with the exception of the Navajo Nation, the level of activity was very low. The Navajo Nation Weatherization Department also faced challenges and was also unable to provide sufficient weatherization services to customers living in APS service territory. The ITCA is working to revise their programs in 2016, to ensure that customers living on reservations receive services in the interim. APS has contracted with Red Feather Development Group, a non-profit 501c3, to deliver weatherization workshops, which included hands-on implementation

of weatherization measures learned in class, to customers living on the Navajo Nation and the Hopi Reservation. Red Feather is very familiar with the challenges of weatherizing traditional housing located on the reservations and adapts their training and measures to meet the needs of these customers. The classes were very well received and resulted in a number of homes being weatherized.

A related issue which has been raised by the agencies serving rural areas is the additional costs incurred to serve these customers. There are costs related to increased time and travel which have a negative impact on their ability to deliver weatherization services in a cost effective manner. These additional costs are being borne by the agency and impact their ability to provide other services. A request has been made by the agencies to charge an additional 15% for administrative fees to cover the costs inherent with serving rural customers living outside a radius more than 25 miles from the agency office.

Program Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

MER Adjusted Gross MW and MWh Savings

Table 33 - MER Adjusted Gross MW and MWh Savings - Low Income Weatherization

Measure	# Homes	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Weatherization	738	1,793	31,369	0.3
TOTAL	738	1,793	31,369	0.3

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

The kW factor used to calculate the savings are based on data from the Arizona Governor's Office of Energy study. The annual energy demand savings per home in this study are estimated to be 0.3 kW. A 17.5 years measure life and kWh savings factor of 2,270 kWh per home, from the current GOEP report, has been utilized to determine the appropriate kWh savings.

Benefits and Net Benefits/Performance Incentive Calculation

The net benefits for this program are provided in Tables 6 and 8.

Costs Incurred

Costs incurred for this program during the current Reporting Period are listed below:

Table 34 - Cost Incurred - Low Income Weatherization

Activity	Incentives	Training & Technical Assistance	Consumer Education	Program Implementation	Program Marketing	Planning & Admin	Program Total Cost
Bill Assistance	\$ (2,042)	\$ -	\$ -	\$ 9,186	\$ -	\$ 2,261	\$ 9,405
Health & Safety	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair and Replace	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Weatherization	\$ 2,094,695	\$ -	\$ 22,541	\$ 50,000	\$ 23,959	\$ 73,742	\$ 2,264,937
3rd Party Manager - Arizona Community Action Association	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -
APS Program Support	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 2,092,653	\$ -	\$ 22,541	\$ 59,186	\$ 23,959	\$ 76,003	\$ 2,274,342

Commission Decision No. 73089 requires APS to report spending for non-EE measures in the Energy Wise Program. There were no non-EE measures or associated spending in this program during this timeframe.

V. Non-Residential Programs

11. Large Existing Facilities

Description

The Large Existing Facilities Program provides prescriptive incentives for owners and operators of large (more than 100 kW aggregated peak monthly demand) Non-Residential facilities to promote energy efficiency improvements in technologies such as lighting, HVAC, motors and refrigeration applications. The Direct Install approach is available for facilities that are individually metered with a peak demand of 400 kW and less. For EE applications not covered by the prescriptive incentives, the program offers custom incentives that are evaluated individually based on energy savings. The program also provides incentives to reduce the cost of an energy study that identifies energy-saving opportunities. The program provides educational and promotional materials designed to assist facility and business owners and operators in making decisions to improve the EE of their facilities.

Program Goals, Objectives and Savings Targets

- Promote and support EE opportunities for existing large Non-Residential customers.
- Promote the installation of high-efficiency technologies including, but not limited to lighting, HVAC equipment, motors and refrigeration systems.
- Promote market transformation through APS trade allies, customer outreach and technical training classes.

Table 35 - Large Existing Facilities Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
28.3	175,050	2,262,630

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

The Large Existing Facilities Program has been the strongest performing Non-Residential program since its inception. During this Reporting Period, APS paid \$13,764,680 in Large Existing program incentives. This figure represents a total of 1,421 paid applications from 536 unique customers and includes projects implemented through Direct Install. Payments to school districts and charter schools comprised 67 of the 1,421 applications.

Table 36 - Large Existing Facilities Program Incentives Paid

Incentive Status by Fund for Paid Applications	Incentives Paid
Large Existing – Prescriptive & Custom	\$13,470,421
Large Existing – Studies	\$ 94,675
Large Existing – Retro-commissioning Studies	\$ 199,584
Total Large Existing Funds	\$13,764,680

In Commission Decision No. 70637 (December 11, 2008), APS was required to track DSM applications resulting from studies for which incentives have been paid and to report results

to the Commission. During this Reporting Period, APS paid incentives for 46 study applications from 20 customers including 20 feasibility studies and 26 retro commissioning studies. 13 of the 46 studies have already resulted in implementation of the associated measures. Since the program's inception, 432 studies have been completed. Of those 432 studies, 189 have resulted in EE project applications to date.

In Commission Decision No. 73089, APS was required to report the type of measures installed by customers after a study was completed. The following measures were installed for studies completed in 2015: custom, HVAC, lighting, motors and refrigeration.

Evaluation/Monitoring Activities and Research Results

- Initiated advanced lighting controls (ALC) research to refine savings estimates, identify program incentive structures offered by other utilities, and identify current trends in the lighting controls market. Research will continue through 2016 and be incorporated in the current Energy Management System offering.
- Completed a field metering study of lighting projects rebated through the Express Solutions program to determine operation hours and coincidence factors by building type. Updated energy and demand impacts for lighting measures to reflect study results.
- Completed and reported on surveys with Solutions for Business participants to assess customer satisfaction, drivers for participation, ability to identify program contractors, use of technical assistance options, gauge website awareness and continued collection of free-ridership and spillover data.
- Completed and reported on surveys with Solutions for Business non-participants to assess program awareness, satisfaction with APS, barriers to participation, interest in energy efficiency upgrades, and awareness of and interest in financing options.
- Developed process flow charts for Solutions for Business – Classic program to identify areas for process improvements. Process flow diagrams for the Custom and Express Solutions programs were started in 2015 and continue to be refined.
- Continued to support program implementer through a "Parallel Path" engineering review of large custom projects, to identify appropriate baselines, savings calculations, and incremental costs.
- Refined incremental cost research for the following high-impact measures: linear fluorescent lighting, compact fluorescent lighting, screw-in LEDs, HVAC tune-ups, energy management systems.
- Conducted ongoing review and analysis of implementation contractor participation databases.
- Reviewed and updated non-residential Measure Analysis Spreadsheets and Analytic Database.
- Calculated energy and demand impacts and researched incremental costs to determine the cost effectiveness for Linear LEDs.
- Assisted the program implementation contractor by conducting a review of incremental cost assumptions for a large custom project application under consideration for an incentive.

Customer Education and Outreach

The focal point of program development activities is centered on specific market segments. The program developed technical resources, information, trainings and advertisements to engage and educate these specific segments.

The program continued to develop and foster relationships with industry and stakeholder associations to enhance outreach efforts and connections with members. During the 2015 Reporting Period, these activities included participation in the following:

- March 18 – BOMA Kilowatt Krackdown Awards (150 attendees)
- May 1 – Arizona Forward Sustainability Summit (100 attendees)
- May 19 – APS Energy Update Meeting (120 attendees)
- May 25 – Arizona Small Business Association Event (35 attendees)
- June 30 – Catholic Diocese of Phoenix (50 attendees)
- September 23 – DATOS (1,000 attendees)
- October 3 – American Institute of Architects Annual Awards Program (200 attendees)
- October 27 - APS Energy Update Meeting (120 attendees)

Customer Awareness and Advertising

In 2015, the Solutions for Business program developed and implemented multi-channel media campaigns to increase awareness among APS business customers. The campaigns consisted of an overarching umbrella awareness theme designed to reach the larger business community for broad exposure, while more targeted media tactics and customized messaging focused on engaging customers within select business segments: Restaurant, Hospitality, Schools, Grocery, Office, Retail, Industrial, and Property Management. S4B Marketing also provided strategic communications support for ongoing outreach through supplier contractors, Trade Allies and APS Key Account Managers (KAMs). This included updating and creating key outreach tools to promote the program, customer case studies, bill communications, and a new Trade Ally website:

- Developed awareness campaign creative, "One Less Thing to Worry About," executed through paid media. A strategic mix of online banner ads, radio, print, search engine marketing (SEM), newsletters, direct mailers and email drove traffic to the Solutions for Business website.
- Redesigned existing brand guides template to a simple flyer form and produced iterations for priority verticals and technologies: Compressed Air, Pumps, Industrial, Schools, Restaurant, Hospitality, Healthcare, Grocery, Retail, Small Office, Large Office
- Developed customer case studies covering the office, medical, grocery, education, hospitality and industrial sectors.
- Updated existing case studies and core materials to flesh out consistency across marketing collateral.
- Developed bill communications to promote S4B to customers when energy costs are top of mind. Bill communications include the quarterly APS FYI newsletter, bill inserts (May, June, July, August, September, October, November) as well as messages printed directly on the bill. The messaging across these owned communications aimed to put emphasis on highlighting customer learnings / success stories and specific technologies.
- Promoted the program to customers and contractors through a customized 2016 Arizona Highways calendars. The calendar included two program-specific back pages; one page highlighted customer projects and the other included the program Quick Look. Additionally, energy efficiency tips were included each month.

- Updated and produced giveaway items and existing print collateral for program and outreach use when promoting the program.
- Produced and printed large checks for presentations to recognize participation and help raise awareness of the program at customer events.

Technical Training

Training courses help customers and trade allies understand technologies and potential for energy savings. This understanding promotes quicker adoption of energy efficiency technologies and encourages customers to undertake more in-depth and holistic projects. Classes allow interaction among customers, topic experts and contractors who can perform work, thus facilitating the contracting process. Feedback from this educational series indicates that customers are more likely to adopt alternative technology following such presentations and the knowledge gained from them.

APS continued to work closely with the Arizona Chapter of the Association of Energy Engineers ("AEE-AZ") to promote and manage registration of the APS Technical Training series. AEE-AZ provided access to their membership to promote the trainings and the Solutions for Business program and also provided APS with turnkey registration support for the training classes that occurred during this Reporting Period. Attendance remained strong during this Reporting Period with many repeat attendees.

The classes held during this Reporting Period attracted 427 attendees at Technical Trainings and 373 at Trade Ally-exclusive events:

- January 21 - Benchmarking Buildings (26 attendees)
- February 12 - Lighting (37 attendees)
- March 18 - Chillers (46 attendees)
- March 19 - HVAC (46 attendees)
- April 15 - Energy Modeling 101 (12 attendees)
- April 16 - Energy Modeling 201 (10 attendees)
- May 13 - Water Pumping Systems (22 attendees)
- June 17 - Multifamily Market (70 attendees)
- July 29 - Creating the High-Performance Building (20 attendees)
- August 19 - Energy 101 (34 attendees)
- September 23 - Energy Studies (25 attendees)
- October 21 - Whole Building/New Construction Design (24 attendees)
- October 27 - Energy Efficiency for Schools (10 attendees)
- November 18 - 2015 IECC Codes (32 attendees)
- December 9 - Fundamentals of Compressed Air Systems (13 attendees)

The program sponsored the following training organizations and related classes:

- AEE – Certified Energy Manager series – semester-long class with 36 participants

Problems Encountered and Proposed Solutions

The following measures were found to have a benefit to cost ratio less than one during this reporting period.

- EMS – Lighting Controls
- Occupancy Sensors
- Premium T8 lamps – 2 and 3 foot
- High Efficient Ice Makers
- Night Covers

APS will monitor these measures and reevaluate them in future Implementation Plans. If these measures are found to not pass, these measures will be suspended.

Program Modifications/Terminations

Commission Decision No. 73089 requires APS to report Energy Management System (“EMS”) and LED measures, annual savings, capacity savings and measure life individually. See Table 36 below:

Table 37 - Large Existing Facilities Program Measures

Measure	Quantity	kWh Savings	kW Savings	Measure Life
EMS - DDC Replacing Pneumatic or Manual Tstat	1,523,521 sq. ft.	5,652,906	0	15
EMS - DDC Replacing Programmable Tstat or Digital System	6,410,357 sq. ft.	19,167,966	0	15
EMS - Integrated Lighting Control	532,425 sq. ft.	633,078	0	10
LED - Non-reflector	34,462	6,349,856	1,834	7
LED – Reflector	20,586	3,930,150	1,135	7
LED - MR16	8,732	1,249,424	361	7

Commission Decision No. 68488 requested that APS inform staff when incentives were paid out that exceeded 50% of the incremental cost of the measure. No measure rebate amount exceeded 50% of the incremental cost of the measure other than those measures that were previously approved by the Commission to exceed 50%.

The prescriptive EMS measure specifications were modified during this reporting period. The specifications were modified to allow buildings which operate 24 hours a day and 7 days a week to participate in the program as long as they met all other requirements. This provided a higher incentive to control systems that pursue a greater degree of control strategies and increased accuracy of deemed savings.

Self-Direction

On January 23, 2009, the Commission issued Decision No. 71444 approving Self-Direction. In this Reporting Period, no customers participated in Self-Direction.

Freeport McMoran Opt-Out Provision

Commission Decision No. 74813 exempted Freeport McMoran from paying into the DSMAC and participating in the Solutions for Business program for their Bagdad mine. It was furthered ordered by the ACC that Freeport McMoran continue to obtain and report energy efficiency activities and savings on an annual basis for their Bagdad mine. During this reporting period, Freeport McMoran reported installing high-efficiency motors, variable speed drives and LED lighting. Freeport McMoran reported a total of 6 high efficiency motors installed in 2015 with a total horsepower rating of 69. Based upon the information provided by Freeport McMoran, APS estimates that the Freeport McMoran Bagdad mine saved approximately 1,814 MWh annually. As ordered, these savings from the Freeport McMoran Bagdad mine are not included in the savings values reported as part of this Demand Side Management portfolio.

Direct Install

The Direct Install measures were launched in April 2009. While these measures are targeted to small businesses, program rules allow small facilities (under 400 kW demand) of large customers to participate. K-12 school buildings of any size can also participate in Direct Install measures. In this Reporting Period, 169 Direct Install projects for Large Existing Facilities were paid a total of \$1,014,842 in incentives. Pursuant to Commission Decision No. 73089, APS has provided a breakdown of required Direct Install program information within the Small Business section.

Trade Allies

Trade Allies are contractors and other industry professionals who deliver EE solutions to customers. The program incorporates a Trade Ally program to ensure an informed and engaged network of service providers work with APS's customers. To be listed as a Solutions for Business Trade Ally, a company must submit an application and attend program training. To remain on the list, the company must participate in the rebate program and attend an annual refresher training.

To keep this audience informed and engaged with the Solutions for Business program, we redesigned our Trade Ally website. The new site features an improved user experience/navigation, APS brand attribution and additional features, including an interactive calendar to see and register for events/training, an electronic order form for marketing materials and an RSS feed.

Outreach is conducted through strategic partnerships within the energy and contracting industry as well as trade show and event participation. In house Trade Ally training is provided monthly which consists of educating contractors on utilization and promotion of the program. Throughout the year, more than 15 events or training classes were conducted with over 600 attendees.

In addition to the monthly Trade Ally training classes and multiple on-site contractor hosted events, the program produced and participated in the following Trade Ally focused events:

- April 9 – APS Solutions for Business Annual Trade Ally Event (220 attendees)

- September 17 – APS Solutions for Business End-of-Year Trade Ally Event (153 attendees)
- December 8 – Mechanical Contractors Trade Association of Arizona Annual Trade Show (200 attendees)

Also as a result of the program’s focus on Trade Ally development and recruiting efforts, 55 new trade allies (companies) were approved during this Reporting Period for a total at the end of this Reporting Period of 230 trade allies (companies).

MER Adjusted Gross MW and MWh Savings

The following table reflects the MER adjusted total energy and demand saving achievements in this Reporting Period for the Large Existing Facilities program. Only savings from projects that were completed and incentives paid are counted in this Progress Report.

Table 38 - MER Adjusted Gross MW and MWh Savings - Large Existing Facilities

Program	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Large Existing Facilities	164,814	2,368,952	32.7
TOTAL	164,814	2,368,952	32.7

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred During the Reporting Period

Cost information is provided in Tables 2(b) and 2(c).

12. New Construction and Major Renovations

Description

The Non-Residential New Construction and Major Renovations program includes four elements: 1) design assistance and feasibility studies, 2) custom measures, 3) prescriptive measures, and 4) whole building applications (construction & design incentives). Design incentives involve efforts to integrate EE into a customer's design process to influence equipment/systems selection and specification as early in the process as possible. Custom and prescriptive incentives are available for EE improvements in lighting, HVAC, motors and refrigeration applications. Whole building applications are intended to promote integrated design strategies.

Program Goals, Objectives and Savings Targets

- Promote integrated design and integrated analysis of alternative high-efficiency design packages through design assistance in new construction and major renovation applications.
- Assist the customer design team in examining alternative high-efficiency design packages through the provision of the design incentive.
- Promote market transformation through APS trade allies, customer outreach and technical training classes.

Table 39 - New Construction Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
4.1	24,750	323,400

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

The majority of new construction and major renovation projects under way are through the Whole Building application. Many of these new projects are highly energy efficient and will receive significant incentives. In this Reporting Period, APS paid a total of \$2,532,430 in New Construction incentives. This represents 157 applications from 97 unique customers.

Incentive status is provided below.

Table 40 - New Construction Program Incentives Paid

Incentive Status for Paid Applications	Incentives Paid
Large New Construction – Prescriptive & Custom	\$2,447,155
Large New Construction – Studies	\$85,275
Total Large New Construction Funds	\$2,532,430

Commission Decision No. 70637 required APS to continue tracking DSM customer applications resulting from studies for paid incentives, and report the semi-annual and cumulative results of its program-to-date tracking efforts. During this Reporting Period, 10 design assistance studies were paid a total of \$75,275 and one commissioning study was paid for \$10,000. F5 of these 11 applications have resulted in EE projects to date. Since

program inception, 86 studies have been completed. Of those 86 studies, 59 resulted in applications for EE projects.

Commission Decision No. 73089 required APS to report the type of measures installed subsequent to the receipt of study or design assistance incentives. The following measures were installed for studies completed in 2015: whole building, HVAC, lighting, motors and building envelope.

APS Solutions for Business launched the whole building incentive in January 2010. During this Reporting Period, the program received 11 Whole Building Pre-Notification applications and 12 Whole Building Final-Notification applications; 9 Whole Building projects were paid incentives.

Evaluation and Monitoring Activities and Research Results

- Performed detailed assessment on a sample of energy simulation models submitted for the Whole Building Construction measure. This review was intended to assess the quality of simulation models and compliance with building codes for estimating energy and demand impacts.
- Created revised "whole building" Measurement Analysis Spreadsheet with updated baseline (ASHRAE 90.1 2010) and revised efficiency tiers.
- Initiated advanced lighting controls (ALC) research to refine savings estimates, identify program incentive structures offered by other utilities, and identify current trends in the lighting controls market.
- Completed a field metering study of lighting projects rebated through the Express Solutions program to determine operation hours and coincidence factors by building type. Updated energy and demand impacts for lighting measures to reflect study results.
- Completed and reported on surveys with Solutions for Business participants to assess customer satisfaction, drivers for participation, ability to identify program contractors, use of technical assistance options, gauge website awareness and continued collection of free-ridership and spillover data.
- Completed and reported on surveys with Solutions for Business non-participants to assess program awareness, satisfaction with APS, barriers to participation, interest in energy efficiency upgrades, and awareness of and interest in financing options.
- Developed process flow charts for Solutions for Business – Classic program to identify areas for process improvements. Process flow diagrams for the Custom and Express Solutions programs were started in 2015 and continue to be refined.
- Refined incremental cost research for the following high-impact measures: linear fluorescent lighting, compact fluorescent lighting, screw-in LEDs, HVAC tune-ups, energy management systems.
- Conducted ongoing review and analysis of implementation contractor participation databases.
- Reviewed and updated non-residential Measure Analysis Spreadsheets and Analytic Database.
- Calculated energy and demand impacts and researched incremental costs to determine the cost effectiveness for Linear LEDs.

Consumer Education and Outreach

Strategic partnerships with industry organizations such as the American Institute of Architects (AIA) and U.S. Green Building Council (USGBC) continue to play an important role in New Construction outreach. During this Reporting Period, APS continued to sponsor the Energy Award at the annual awards of AIA. This partnership will help the program attract allies in the architectural sector and promote the Whole Building incentive. Architects can access low cost Continuing Education Units through the APS Technical Training program.

In addition to many of the marketing and outreach activities described for the Large Existing program, outreach activities for the New Construction program focus on educating potential program participants from the following customer segments: owner-occupied buildings, government buildings (schools, county, city, state) and signature projects.

Additional New Construction program events:
October 3 – AIA Awards event (200 attendees)
October 21 – Whole Building training (24 attendees)

Problems Encountered and Proposed Solutions

The following measures were found to have a benefit to cost ratio less than one during this reporting period.

- High Efficient Ice Machines

APS will monitor these measures and reevaluate them in future Implementation Plans. If these measures are found to not pass, these measures will be suspended.

Program Modifications / Terminations

No program modifications to report during this period.

MER Adjusted Gross MW and MWh Savings

The following table reflects the MER adjusted total energy and demand saving achievements in this Reporting Period for the Large New Construction Program. Only savings from projects that were completed and incentives paid are counted in this Progress Report.

Table 41 - MER Adjusted Gross MW and MWh Savings - Non-Residential New Construction and Major Renovation

Program	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
New Construction and Major Renovation	33,426	472,719	7.7
TOTAL	33,426	472,719	7.7

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

13. Small Business Program

Program Overview

The Non-Residential Small Business Program provides prescriptive incentives for small Non-Residential customers (≤ 100 kW of aggregated peak monthly demand) for EE improvements in lighting, HVAC, motors and refrigeration applications through a simple and straightforward mechanism for program participation. Small Business customers are also eligible for custom incentives to implement EE measures. The program provides incentives for conducting an energy study that identifies energy saving opportunities. Direct Install measures were introduced to the Small Business market in April 2009.

Program Goals, Objectives and Savings Targets

- Promote and support EE opportunities for small Non-Residential customers.
- Promote the installation of high-efficiency lighting, packaged HVAC equipment, motors and refrigeration systems.
- Provide customers with direct energy saving opportunity identification and implementation services through the Direct Install family of measures.
- Promote cross-training and EE assessment and referral opportunities among lighting and refrigeration contractors.
- Promote market transformation through APS trade allies and customer outreach.

Table 42 - Small Business Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
2.8	14,950	186,300

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

While the program offers a pre-notification process, final applications are only processed after the project is completed and all required documentation is submitted and approved.

Table 43 - Small Business Program Incentives Paid

Incentive Status for Paid Applications	Incentives Paid
Small Business – Prescriptive & Custom	\$1,460,246
Small Business – Studies	\$2,800
Small Business – Retro commissioning Studies	\$0
Total Small Business Funds	\$1,463,046

Of the 614 small business projects paid, 408 were conducted through the Classic prescriptive/custom program and 206 were conducted through Direct Install. None of the 614 applications were from school districts.

APS paid incentives on 614 applications from 494 unique customers during this Reporting Period.

Commission Decision No. 70637, required APS to continue tracking DSM customer applications resulting from studies for paid incentives, and report the semi-annual and cumulative results of its program-to-date tracking efforts. There were three study incentives paid in the Small Business program during this Reporting Period and none of these resulted in a DSM application. Eleven studies have been completed since program inception, of which six study applications have resulted in EE projects.

In Commission Decision No. 73089, required APS to report the type of measures installed by customers after a study was completed. No measures were installed as a result of the studies completed.

Evaluation and Monitoring Activities and Results

- Initiated advanced lighting controls (ALC) research to refine savings estimates, identify program incentive structures offered by other utilities, and identify current trends in the lighting controls market. Research will continue through 2016 and be incorporated in the current Energy Management System offering.
- Completed a field metering study of lighting projects rebated through the Express Solutions program to determine operation hours and coincidence factors by building type. Updated energy and demand impacts for lighting measures to reflect study results.
- Completed and reported on surveys with Solutions for Business participants to assess customer satisfaction, drivers for participation, ability to identify program contractors, use of technical assistance options, gauge website awareness and continued collection of free-ridership and spillover data.
- Completed and reported on surveys with Solutions for Business non-participants to assess program awareness, satisfaction with APS, barriers to participation, interest in energy efficiency upgrades, and awareness of and interest in financing options.
- Developed process flow charts for Solutions for Business – Classic program to identify areas for process improvements. Process flow diagrams for the Custom and Express Solutions programs were started in 2015 and continue to be refined.
- Refined incremental cost research for the following high-impact measures: linear fluorescent lighting, compact fluorescent lighting, screw-in LEDs, HVAC tune-ups, energy management systems.
- Conducted ongoing review and analysis of implementation contractor participation databases.
- Reviewed and updated non-residential Measure Analysis Spreadsheets and Analytic Database.
- Calculated energy and demand impacts and researched incremental costs to determine the cost effectiveness for Linear LEDs.
- Assisted the program implementation contractor by conducting a review of incremental cost assumptions for a large custom project application under consideration for an incentive.

Direct Install

Pursuant to Commission Decision No. 73089, APS is providing a breakdown of required direct install program information below. Direct Install incentives were paid on 206 projects for Small Business customers during this Reporting Period. While small businesses are the primary target for the Direct Install offering, large customers with facilities of 400 kW or less premise demand qualify for Direct Install measure incentives, and schools of any size can participate. In addition to the 206 projects paid to small businesses, 195 Direct Install projects for Large Businesses and Schools were paid.

Projects implemented through Direct Install during this Reporting Period saved 13,938 MWh annually and 182,887 MWh over the lifetime of the measures.

1. Active Number of Contractors and Contractor Identification: Direct Install contractor participation from approved contractors has remained consistent. During this Reporting Period, 16 approved contractors participated in Direct Install. Contractors participating during the current Reporting Period include the following:

- Accel Electric AZ LLC
- ATS Electric Inc
- Burden Electric LLC
- D & H Electric, Inc.
- Demand Drop
- Eco Power LLC
- Inline Electrical Resources
- J & S Electric LLC
- LightDay Solar Inc.
- Red Mountain Lighting & Energy Service
- Redline Electric LLC
- Rob Love Electric Inc
- Stone Kat Development
- SuperMarket Energy Technologies
- The Signery
- US Energy Services Inc

No Express Solutions contractor training meetings were held for parties interested in participating in Direct Install this year. However, program changes are communicated with all Direct Install trade allies and contractor training is provided on an adhoc basis for any questions that arise from the contractor community. No new companies were approved for Direct Install measure participation during the 2015 program year.

2. Number of Direct Install Jobs Completed: A total of 401 Direct Install projects were paid incentives during this Reporting Period.

3. Dollar Value of the Direct Install Incentives Paid to Contractors: During this Reporting Period, \$1,760,839 in Direct Install incentives were paid to contractors. This represents 66% of the total project costs.

4. Dollar Value of the Direct Install Jobs Paid by the Customer: The total cost of the Direct Install projects during this Reporting Period was \$2,660,020. Customers paid \$899,181 toward these Direct Install projects during this Reporting Period.

5. Quantity of Each Direct Install measure for which incentives were paid:

Table 44 - Small Business Program Direct Install Measures

Direct Install Measure	Quantity
Delamping	8,202
T8 Lighting	15,250
Screw-in CFL	90
Occupancy Sensors	964
Exit Signs	210
Refrigerated Case Fan Motors	2,347
Anti-Sweat Heater Controls	1,706
Refrigerated Novelty Case Controls	73
Refrigerated Case Evaporator Fan Controls	637
Hard-Wired CFL	5,647
Occupancy Sensors - Vending Machines	4

6. Number of Instances Where Incentives Were Reduced Because of Eligibility for Incentives Paid by Other Entities: No known occurrences during this Reporting Period.

7. Savings Numbers Attributable to Direct Install for the Period and Year-to-Date and Program-to-Date:

Table 45 - Small Business Program Direct Install Savings Year-to-Date

kW Savings	Annual kWh Savings	Lifetime kWh Savings
3,040	13,937,591	182,886,577

Table 46 - Small Business Program Direct Install Savings MER Adjusted Program-to-Date

kW Savings	Annual kWh Savings	Lifetime kWh Savings
32,654	152,638,784	2,166,448,363

MER savings are adjusted for line losses (energy 7.0%, demand 11.7%) and a capacity reserve factor of 15%

8. Descriptions of the Types of Businesses Participating in Direct Install: The "Grocery" sector participated in the Direct Install measure at the highest rate of frequency within identified business segments and accounted for 28% of Direct Install projects paid during this Reporting Period.

Table 47 - Small Business Program Direct Install Participation

Participation included the following business types:	
College/University	2
Grocery	112
Hotel/Motel	2
K-12 School	28
Medical	7
Miscellaneous	81
Office	45
Process Industrial	10
Restaurant	43
Retail	45
Warehouse	26

9. Estimate of Avoided Marketing or Other Program or Administration Costs:

The costs to implement and market the Small Business program prior to implementing the Direct Install measures were higher on a \$/kWh basis as compared to the classic program. This is because low participation resulted in low kWh savings over which to spread implementation costs. From the program inception through 2008 because Direct Install was not available, implementation and marketing costs for Small Business was \$1.41M (excluding incentives). Program net annual savings achieved were 5,544,000 kWh. This resulted in non-incentive program costs of \$.25/kWh saved for the Small Business program.

In this Reporting Period, estimated Direct Install implementation and marketing costs decreased to \$0.048/kWh saved, due to increased kWh savings and lower costs of the Direct Install process. The total Small Business program cost savings is estimated to be \$2,815,393 over the 2008 program cost rate. [Reduced program costs = $(\$0.25 - \$0.048) \times 13,937,591$ net annual savings.]

Consumer Education and Outreach

In 2015, specific marketing activities targeted small- and medium-size customers to promote program awareness and participation. In addition to the broad awareness advertising campaign that was aimed toward a small-mid audience, specific Express Solutions marketing efforts for 2015 included:

- Developing and producing case studies highlighting small business customers and their energy-saving projects.
- Developing and producing bill inserts highlighting Express Solutions to promote the program and inform customers of the program participation process.
- Developing and producing new outreach materials to be used at various touchpoints with the customer. This included a new program overview flyer, updating the existing program bookmark and creating a new leave-behind magnet as a congratulations for participants to receive after project inspection.

Problems Encountered and Proposed Solutions

The following measures were found to have a benefit to cost ratio less than one during this reporting period.

- Occupancy Sensors
- EMS
- T8 and Electronic Ballast 8-foot

APS will monitor these measures in 2015 and reevaluate them in future Implementation Plans. If these measures are found to not pass, these measures will be suspended.

Program Modifications/Terminated

Commission Decision No. 73089 requires APS report the number of EMS and LED measures installed, the annual energy and capacity savings, and measure life on an individual basis. Please see Table 48 below:

Table 48 - Small Business Program Direct Install Program Modifications

Measure	Quantity	kWh Savings	kW Savings	Measure Life
EMS - DDC Replacing Pneumatic or Manual T-stat	51,233 sq. ft.	138,329	0	15
EMS - DDC Replacing Programmable T-stat or digital system	0	0	0	0
EMS - Integrated Lighting Control	0	0	0	0
LED - non-reflector	7,962	1,471,295	423.82	7
LED - reflector	5,905	1,130,060	325.63	7
LED - MR16	1,340	191,749	55.35	7

As reported previously, all lighting and sensor measures within direct install were subject to a reduction of 17% in all reported savings to account for MER findings surrounding the realization rate of operating hours. As of July 1st 2015, this 17% reduction was lifted and deemed operating hours which are based on the installation site facility type were put into effect. These deemed operating hours further reduced reported savings and aim to level realization rates. The deemed operating hours were the result of a comprehensive study that calculated average operating hours based on facility type as follows:

Table 49 – Direct Install Weekly Operating Hours

Direct Install Facility Type	Deemed Operating Hours
College/University	47.71
Grocery	70.39
Hotel/Motel	75.12
K-12 School	65.69
Medical	49.65
Miscellaneous	61
Office	49.46
Process Industrial	51.73
Restaurant	60.79
Retail	66.19
Warehouse	49.96
Data Centers	51.73

In addition to these deemed operating hours, two special conditions were allowed to take place. One being for 24/7 schedules with operating hours of 168 per week, and the other being for dusk-to-dawn schedules with operating hours of 84 per week.

MER Adjusted Gross MW and MWh Savings

The following table reflects the total energy and demand saving achievements in this Reporting Period for Small Businesses. Only savings from projects that were completed and incentives paid are counted in this Progress Report.

Table 50 - MER Adjusted Gross MW and MWh Savings - Non-Residential Small Business Program

Program	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Small Business	14,867	178,080	4.2
TOTAL	14,867	178,080	4.2

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

14. Schools Program

Description

The Schools program includes a dedicated budget for schools and provides assistance for reducing the energy used in school buildings, including public, private and charter schools ("K-12"). The incentives available for schools include the same DSM measures that are available for all Non-Residential customers, as well as Direct Install measures for K-12 schools of any size.

Program Goals, Objectives and Savings Targets

- Maximize the energy savings that can be attained with available DSM funds by providing schools incentives to upgrade lighting, HVAC, refrigeration, and any other energy consuming systems.
- Provide educational and training materials to facility managers and trade allies in order to aid schools in other energy conservation projects.
- Promote market transformation through APS trade allies, customer outreach and technical training classes.
- Provide incentives for other cost effective DSM projects by allowing schools to participate in any Non-Residential DSM Program including Direct Install.

Table 51 - Schools Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
2.6	15,170	199,850

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

In this Reporting Period, APS paid incentives for 203 applications from schools, of which 130 were paid from the schools fund category. This represents 37 unique school districts and charter schools. Schools continued to have had a very high level of participation in the program.

The self-reported size of the school entity (based on the number of students) for approved applications paid in this Reporting Period are:

Table 52 - Schools Program Applications

Division	Programs	# of Applications	# of Students
Metro	Prescriptive Measures - New Construction	3	643
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	3	3751
Non Metro	Prescriptive Measures - New Construction, Prescriptive Measures - Retrofit, Custom Measures - New Construction	5	8730
Non Metro	Custom Measures - Retrofit	2	185
Non Metro	Custom Measures - Retrofit, Express Solutions, Prescriptive Measures - Retrofit	37	7014
Non Metro	Prescriptive Measures - Retrofit	3	5419
Non Metro	Prescriptive Measures - Retrofit	1	1025
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	4	479
Non Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	4	453
Non Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit, Technical Assistance & Studies	3	3568
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	21	34365
Metro	Prescriptive Measures - Retrofit	1	26712
Metro	Custom Measures - Retrofit, Express Solutions	2	248
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	4	13897
Non Metro	Prescriptive Measures - Retrofit	1	1885
Non Metro	Prescriptive Measures - Retrofit	1	620
Metro	Prescriptive Measures - New Construction, Custom Measures - New Construction	3	120
Non Metro	Express Solutions	1	120
Metro	Prescriptive Measures - Retrofit	1	913
Non Metro	Prescriptive Measures - New Construction	1	3333
Metro	Custom Measures - Retrofit	1	6223
Non Metro	Prescriptive Measures - Retrofit	3	1153
Non Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	2	1151
Metro	Custom Measures - Retrofit	1	283
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	11	2014
Metro	Prescriptive Measures - Retrofit, Custom Measures - New Construction	2	903
Metro	Prescriptive Measures - New Construction, Prescriptive Measures - Retrofit	5	32732
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	12	37069
Metro	Prescriptive Measures - Retrofit	2	7459
Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit, New Construction - Whole Building Construction, New Construction - Whole Building Design, Technical Assistance & Studies	20	26814
Non Metro	Custom Measures - Retrofit, Prescriptive Measures - Retrofit	2	48525
Non Metro	Custom Measures - Retrofit	1	1436
Metro	Custom Measures - Retrofit	1	650
Non Metro	Prescriptive Measures - Retrofit	1	282
Metro	Prescriptive Measures - Retrofit	1	112
Metro	Prescriptive Measures - Retrofit	2	23281
Non Metro	Express Solutions, Prescriptive Measures - Retrofit	35	9007

When an incentive application is received from a school district and deemed eligible, funding is first allocated from the Schools budget up to a maximum of \$100,000. Any additional funding required to cover the application is then allocated from the appropriate Large Existing, New Construction or Small Business program budget.

APS paid \$2,338,146 in incentives to schools during the Reporting Period, of which \$1,265,392 was paid from the Schools program budget. The remaining \$1,072,755 was paid to schools from the Large Existing program and New Construction program budgets (see Tables 53 and 54 below).

Table 53 - Schools Program Incentives Paid from Program Budget

Incentive Status by Fund for Paid Applications	Incentives Paid
Schools Budget – Prescriptive, Custom, and Direct Install	\$1,255,392
Schools Budget – Feasibility, Design Assistance	\$10,000
Schools Budget – Retro commissioning Studies	\$0
Total School Funds	\$1,265,392

Table 54 – Total Schools Program Incentives Paid

Schools Funding Summary:	Incentives Paid
Schools – School Funds	\$1,265,392
Schools – Large Existing Funds	\$911,114
Schools – New Construction Funds	\$161,641
Schools – Small Business Funds	\$0
Total Paid to Schools	\$2,338,146

In Commission Decision No. 70637, the Commission ordered APS to continue tracking DSM applications resulting from studies for which incentives have been paid, and report the semi-annual and cumulative results of its program-to-date tracking efforts. One feasibility study incentive was paid from school funds during this Reporting Period for a total of \$10,000. This application resulted in an energy efficiency project. Since program inception, 46 studies have been completed at schools; of those 46 studies, 40 have resulted in EE projects at schools.

In Commission Decision No. 73089, the ACC requested that APS report the type of measures installed after a study was completed. The following measures were installed for studies completed in 2015: custom, lighting, and HVAC.

Schools Direct Install

Direct Install incentives were paid on 28 school projects during this Reporting Period. Of the 28 projects, 26 were paid from the Schools fund. Direct Install activities for this period are described in the Small Business Program report.

Pursuant to Commission Decision No. 73089, APS is providing a breakdown of required direct install program information within the Small Business section.

Evaluation and Monitoring Activities and Research Results

- Initiated advanced lighting controls (ALC) research to refine savings estimates, identify program incentive structures offered by other utilities, and identify current trends in the lighting controls market. Research will continue through 2016 and be incorporated in the current Energy Management System offering.
- Completed a field metering study of lighting projects rebated through the Express Solutions program to determine operation hours and coincidence factors by building type. Updated energy and demand impacts for lighting measures to reflect study results.
- Completed and reported on surveys with Solutions for Business participants to assess customer satisfaction, drivers for participation, ability to identify program contractors, use of technical assistance options, gauge website awareness and continued collection of free-ridership and spillover data.
- Completed and reported on surveys with Solutions for Business non-participants to assess program awareness, satisfaction with APS, barriers to participation, interest in energy efficiency upgrades, and awareness of and interest in financing options.
- Developed process flow charts for Solutions for Business – Classic program to identify areas for process improvements. Process flow diagrams for the Custom and Express Solutions programs were started in 2015 and continue to be refined.
- Continued to support program implementer through a “Parallel Path” engineering review of large custom projects, to identify appropriate baselines, savings calculations, and incremental costs.
- Refined incremental cost research for the following high-impact measures: linear fluorescent lighting, compact fluorescent lighting, screw-in LEDs, HVAC tune-ups, energy management systems.
- Conducted ongoing review and analysis of implementation contractor participation databases.
- Reviewed and updated non-residential Measure Analysis Spreadsheets and Analytic Database.
- Calculated energy and demand impacts and researched incremental costs to determine the cost effectiveness for Linear LEDs.
- Assisted the program implementation contractor by conducting a review of incremental cost assumptions for a large custom project application under consideration for an incentive.

Consumer Education and Outreach

In addition to many of the marketing outreach activities described for the large existing program, marketing activities associated with the Schools program centered on four areas of focus:

Customer awareness and project generation

During this Reporting Period, over 250 contacts were made including phone calls, e-mails and meetings with schools to identify potential new projects. Staff supported a booth, making contacts with school officials as well as contractors at the following Arizona Association of School Board Officials (“AASBO”) and Arizona School Administrators (“ASA”) event locations:

- March conference in Bullhead City
- Annual July conference in Tucson
- October conference in Prescott

Coordination with the Schools Facility Board ("SFB")

Staff attends all SFB meetings to stay abreast of school EE projects, both funding and progress. Emergency repairs approved by SFB include equipment covered by program specifications such as cooling systems. As these are approved, Solutions for Business follows up with the districts to see how they can assist in planning the upgrades, scoping projects, reviewing plans, and completing the rebate application to produce the deepest savings and rebates applicable to the program.

Coordination with the APS Schools Key Account Manager

Program staff has coordinated with the APS Key Account Managers ("KAM") who have schools assigned to them, to optimize the customer's time and value during planned meetings. The partnership with the APS's Schools KAMs has facilitated troubleshooting of other related customer issues, a focused approach to schools related issues and concerns, and as well as the cross-selling of other DSM programs.

Attended Arizona Association of School Board Officials (AASBO) conference and meetings

Program staff has attended AASBO bi-monthly meetings where school business and finance professionals meet. The latest news on legislative and financial issues pertaining to schools is disseminated at these meetings, and contacts have been made with school business officials to keep them abreast of all available rebates or funding that can help with energy efficiency upgrades and improvements at a reduced cost to the schools.

Problems Encountered and Proposed Solutions

The following measures were found to have a benefit to cost ratio less than one during this reporting period.

- EMS
- T8 to T8 premium
- Occupancy Sensors
- Premium T8, 2 and 3 foot lamps

APS will monitor these measures and reevaluate them in future Implementation Plans. If these measures are found to not pass, these measures will be suspended.

Program Modifications/Terminations

During this Reporting Period, EMS and LED measures were offered. Commission Decision No. 73089 requires APS report the number of these measures installed, the annual energy and capacity savings, and measure life on an individual basis. Please see Table 55 below:

Table 55 –Schools Program Measures Savings

Measure	Quantity	kWh Savings	kW Savings	Measure Life
EMS - DDC Replacing Pneumatic or Manual T-stat	474,837 sq. ft.	1,859,133	-	15
EMS - DDC Replacing Programmable T-stat or digital system	571,935 sq. ft.	1,750,122	-	15
EMS - Integrated Lighting Control	180,450 sq. ft.	214,563	-	10
LED - non-reflector	451	83,918	49,760	7
LED – reflector	294	56,694	59,305	7
LED - MR16	29	4,160	8,959	7

See the Large Existing, New Construction and Direct Install program sections for changes to the Solutions for Business Program.

MER Adjusted Gross MW and MWh Savings

The following table reflects the total energy and demand saving achievements for schools projects completed and paid during this Reporting Period.

Table 56 - MER Adjusted Gross kW and kWh Savings - Non-Residential Schools Program

Table 56 - MER Adjusted Gross MW and MWh Savings - Non-Residential Schools Program

Program	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Schools - School Program Funds	12,925	192,453	3.8
Schools - Large Existing Program Funds	10,139	151,221	2.2
Schools - New Construction Program Funds	762	10,842	0.2
Schools - Small Business Program Funds	0	0	0.0
TOTAL	23,826	354,516	6.2

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

15. Energy Information Services (“EIS”) Program

Description

The EIS Program started in November 2006 with an objective to help customers (>100 kW) save energy through better understanding and control of their facilities’ electrical usage. EIS is a tool that provides data regarding usage (kWh) and demand (kW). This detailed information allows customers the ability to fine-tune equipment use, operations and produce summaries to document the impact of usage and demand modifications. Participating customers monitor their electric usage through a web-based dashboard that allows them to view historical 15-minute interval usage and demand graphics from the previous day. This information can be used to improve and monitor energy usage patterns, reduce energy use, reduce demands during on-peak periods and better manage overall facility energy operations.

APS is encouraging customers to take advantage of the EIS program by providing a one-time incentive of up to a maximum of \$12,000 per year or 75% of the cost of installing metering and communications equipment necessary to participate in the program.

Program Goals, Objectives and Savings Targets

- Provide monthly energy usage information to participating Non-Residential customers.
- Participants identify strategies to lower energy cost by reducing energy usage and demand.
- Educate EIS program participants about utility rate concepts and how managing or reducing their energy consumption through EE measures and operational practices can reduce their energy expenses.
- Educate participants on how to download billing history information and create spreadsheets to chart and graph their energy use, as well as to identify consumption trends and savings opportunities.
- Educate EIS participants about creating reports for management that justify energy-efficient capital expenses intended to produce operations and maintenance savings.
- Facilitate analysis of what-if scenarios to help facility manager to assess the benefits of capital improvements or operating adjustments to promote energy efficient changes.

Table 57 - Energy Information Services Program Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
5.8	80	420

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

Several customers were added and several opted out of the program in 2015. The result was no net change in the number of EIS customers. The number of enrolled meters was reduced by 45 in 2015. A total of 64 customers comprised of 224 meters are currently enrolled in the EIS program.

Evaluation and Monitoring Activities and Research Results

- Observed user group meetings and training, to be followed up with possible on-site verification of energy efficient equipment/settings, interval energy consumption data analysis, telephone surveys with participants, benchmarking against similar analytical tools.
- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database.
- Conducted ongoing tracking and review of program participation data.

Consumer Education and Outreach

Implementation contractor provided onsite consultations with product demonstrations and online product demonstrations.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

MER Adjusted Gross MW and MWh Savings

Table 58 - MER Adjusted Gross MW and MWh Savings - Non-Residential Energy Information Services Program

Program	# Meters	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Energy Information Services	224	31	157	2.1
TOTAL	224	31	157	2.1

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Cost information is provided in Tables 2(b) and 2(c).

VI. Demand Response Programs

16. Home Energy Information Pilot

On February 13, 2015, APS filed end-of-pilot reports for the HEI Pilot programs in Docket No. E-01345A-10-0075. The reports include full descriptions, background, goals, objectives, participation levels, measurement and evaluation activities, results and plans for the future for the pilot programs. APS recommended discontinuation of the pilot (with the exception of the Prepaid Energy Program which will be suspended at the end of 2016).

17. Peak Time Rebate – Residential

Description

Peak Time Rebates ("PTR"), is a DR program for APS's Residential customers. PTR is a Pilot program which became effective on January 1, 2010.

The program provides a price signal to incent customers to reduce their usage during events initiated by APS. PTR events will take place during June through September, weekdays between 2 p.m. and 7 p.m. (Monday through Friday), excluding holidays. Customers will be notified of an event by telephone or e-mail by 4:00 p.m. of the day prior to the PTR Event. Events are limited to 80 hours during the season. APS is required to initiate a minimum of six events and a maximum of 18 events.

Customers will receive a 25 cent per kWh discount off of their electricity bill for all of the electricity usage reduced from their baseline usage during an event.

Program Goals, Objectives and Savings Targets

The program is estimated to provide a 2015 average load reduction amount of 0.40 MW. The 0.40 MW load reduction will provide 1,752 MWh of annual savings. Load reduction and savings targets are summarized in Table 10 – Demand Response Program/Initiatives Load Reduction and Energy Savings 2015.

Levels of Customer Participation

Approximately 880 Residential customers are enrolled in the program.

Evaluation and Monitoring Activities and Results

18 PTR events were called during this Reporting Period and resulted in an average of 0.36 kW per customer load reduction per event.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminated

No programs or measures were modified or terminated during this Reporting Period. PTR will be discontinued in 2016 because over the life of the program the load reduction per customer was lower than for Critical Peak Pricing. APS will continue to offer Critical Peak Pricing.

Consumer Education Outreach

No additional education was provided for this program in 2015.

18. Time of Use ("TOU") Rates Including Super Peak Pricing ("SPP")

Description

TOU rates are designed 1) to reflect the time variation in the cost of producing electricity, to more accurately match those costs with the service being provided to the customer thereby encouraging efficient use of energy, and 2) to encourage customers to reduce consumption during peak hours or to shift energy usage to off-peak periods.

APS currently offers five Residential TOU rates:

- a. Two "Series 1" rates that have on-peak hours from 9:00 a.m. to 9:00 p.m. and have been offered since 1982. The Series 1 rates were closed to new customers on January 1, 2010,
- b. Two "Series 2" rates that have on-peak hours from 12:00 pm Noon to 7:00 p.m. and have been offered since 2006. These rates offer customers 40% fewer on-peak hours; and
- c. One Super-Peak Pricing TOU rate that went into effect on January 1, 2010. The Super Peak periods are pre-determined and set forth in the rate schedule. Participating customers will pay higher charges during the "Super-Peak" periods, but will pay lower charges during off-peak periods. The "Super-Peak" period is 3:00 p.m. to 6:00 p.m., Monday thru Friday during June, July, and August (excluding holidays).

Program Goals, Objectives and Savings Targets

The program is estimated to provide a 2015 load reduction amount of approximately 157 MW from the Series 1 and 2 rates and 2.44 MW from the Super Peak rate. The 157 MW total load reduction will provide 687,660 MWh of annual savings from January through December 2015. Load reduction and savings targets are summarized in Table 10 – Demand Response Program/Initiatives Load Reduction and Energy Savings 2015.

Levels of Customer Participation

Approximately 568,500 customers are enrolled in the TOU rates of which 1,585 are super peak customers. As of December 2015, 85 schools were enrolled in the TOU school rates.

Evaluation/Monitoring Activities and Research Results

No evaluation of TOU rates was performed during this Reporting Period.

Consumer Education and Outreach

The TOU marketing outreach is outlined below:

- Lifestyles Newsletter in the April "At Your Service" article
- Rate Brochures

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Programs or Measures Modified/Terminations

No programs or measures were modified or terminated during this Reporting Period.

19. APS Peak Solutions® Program

Description

APS Peak Solutions® is a commercial and industrial demand response ("DR") program for APS's Yuma and Phoenix metro customers utilizing direct load control and manual load reduction.

The program began on June 1, 2010 and is available for the summer months of June through September between 12:00 noon and 8:00 p.m. (Sunday - Saturday) daily. Customers are notified approximately two hours prior to the start of a Peak Solutions® event. Events are limited to minimum of one hour and maximum of four hours per day and 80 event-hours during the season. The program is required to have one test at the start of the season between June 1 and July 15 lasting for four hours.

Customers are paid an incentive check at the end of the season for their load reduction amount based on \$/kW or \$/ton of air conditioning.

Program Goals, Objectives and Savings Targets

In 2015, a 29.4 MW load reduction provided 128,680 MWh of annual savings realized from January through December 2015. Load reduction and savings targets are summarized in Table 10 – Demand Response Program/Initiatives Load Reduction and Energy Savings 2015.

Levels of Customer Participation

Approximately 791 customers are enrolled in the program.

Evaluation/Monitoring Activities and Research Results

During this Reporting Period one Peak Solutions® test was called in June 2015.

Consumer Education and Outreach

Customer program enrollment has been accomplished; outreach is primarily to customers enrolled in the program in preparation of an event.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Programs or Measures Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

20. Critical Peak Pricing – General Service and Residential

Description

Critical Peak Pricing ("CPP"), or its marketing name of Peak Event Pricing, is a DR program for both APS's business (or General Service) and Residential customers in the Yuma and Phoenix metro areas utilizing manual load reduction. CPP is a Pilot program which became effective on January 1, 2010.

The program provides a price signal to incent customers to reduce their usage during events initiated by APS. CPP events will take place during June through September, weekdays between 2 p.m. and 7 p.m. (Monday through Friday), excluding holidays. Customers will be notified of an event by telephone or e-mail by 4:00 p.m. of the day prior to the CPP event. Peak Events are limited to 80 hours during the season. APS is required to initiate a minimum of six events and a maximum of 18 events.

Customers receive a kWh discount incentive off of their existing rate for all of the electricity usage during the program months of June through September.

Program Goals, Objectives and Savings Targets

The program is estimated to provide a 2015 load reduction amount of 0.20 MW. The 0.20 MW load reduction will provide 832 MWh of annual savings. Load reduction and savings targets are summarized in Table 10 – Demand Response Program/Initiatives Load Reduction and Energy Savings 2015.

Levels of Customer Participation

Approximately 456 Residential and no business customers are enrolled in the program.

Evaluation, Monitoring activities and Research Results

18 CPP events were called during this Reporting Period and resulted in an average of 0.20 kW load reduction/customer per event.

Consumer Education and Outreach

Customers in the program were emailed energy reduction tips during event periods.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Programs or Measures Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

VII. Financing Programs

Non-Residential Energy Efficiency Financing

On January 26, 2010, the Commission issued Commission Decision No. 71460, which approved the Non-Residential Customer Repayment Financing option. The option was approved for schools, municipalities and small businesses. Commission Decision No. 72088 expanded eligibility for the financing program to include all Non-Residential customers.

APS has partnered with National Bank of Arizona ("NBAZ") to offer this financing option. The Financing option was launched in May of 2010. More than half of the program trade allies have participated in financing training. The program developed educational materials for bankers, customers and trade allies to facilitate the process. Non-Residential loans made in 2015 are summarized below:

Table 59 – Non-Residential Financing Programs

Category	Number of Loans	Total Loan Value	Amount in Default
Large Existing	0	\$0	0
Small	0	\$0	0
Schools	0	\$0	0
Total	0	\$0	0

Residential Energy Efficiency Financing

On September 1, 2010, the Commission issued Decision No. 71866, which approved the Residential Energy Efficiency Financing ("REEF") Program. Through this program, APS customers who participate in the Home Performance with ENERGY STAR® program can gain access to financing for energy efficient home improvements.

Launched in February 2011, APS partnered with NBAZ to deliver the REEF program throughout the APS territory.

No customers defaulted in 2015 and APS will continue to monitor defaults closely. Residential loans are summarized below:

Table 60 – Residential Financing Programs

Category	Number of Loans	Total Loan Value
Loans issued Jan - Dec. 31, 2015	14	\$93,499
Jobs in default	0	0
Jobs deemed unrecoverable	0	0

VIII. Energy Efficiency Initiatives

APS System Savings Initiative

Description

The APS System Savings Initiative was approved by the Arizona Corporation in Decision No. 75323. The initiative is designed to save energy through energy efficiency upgrades to APS generation facilities. The transmission and distribution system, and APS owned streetlights, buildings and facilities.

Program Goals, Objectives and Savings Targets

The objective of the APS System Savings Initiative is to take advantage of opportunities for savings energy within APS generation, transmission, distribution and operations facilities. The initiative offers the potential for significant cost effective energy savings that can help lower EES compliance costs for ratepayers while meeting the energy savings objectives of the EE Standard.

In 2015, APS estimated savings of up to 13,000 MWhs of annual savings from a combination of system savings projects including Conservation Voltage Reduction upgrades to the T&D system, well pump upgrades and replacements to generation plant water wells, and energy efficiency upgrades to APS operations facilities. Table 61 shows the program goals and objectives for 2015 as filed in the 2015 DSM Implementation Plan.

Table 61 - APS System Savings Initiative Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
4.3	13,000	195,000

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

During this reporting period, APS operated a total of 5 distribution system feeders in 'Conservation Voltage Reduction' mode (PNR-17, PNR-20, PNR-21, PNR-22, and MZT). Collectively these feeders serve approximately 4850 customers who benefited from energy efficiency savings on their bills as a direct result of the Conservation Voltage Reduction initiative.

Evaluation/Monitoring Activities and Research Results

During the program approval process, APS worked closely with ACC Staff and independent third party evaluators to review and confirm the energy savings and cost effectiveness calculations for this initiative. As projects have been implemented, APS has used the same processes to calculate and report savings that are currently being used for similar measures in the Non-Residential Solutions for Business program. All documentation of APS System Savings projects has been provided to the independent third party evaluator for review and verification.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

Consumer Education and Outreach

Not applicable.

Other Significant Information

No other significant information to report at this time.

MER Adjusted Gross MW and MWh Savings

Table 62 - MER Adjusted Gross MW and MWh Savings - APS System Savings Initiative

Project	# Units	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Conservation Voltage Reduction	5 feeders	2,160	2,160	0.0
VFD at West Phoenix Well Pump #1A	500 Horsepower	657	9,855	0.1
VFD at Yucca Well Pump #4	150 Horsepower	197	2,956	0.0
APS Deer Valley Bldg EMS system	13,000 Sq Ft	30	451	0.0
APS Deer Valley Bldg VFD HVAC	10 Horsepower	25	371	0.0
Cholla Pump CH-P-15 Pump Repair	kWh	42	508	0.0
Cholla Pump CH-P-34M Pump Repair	kWh	2	22	0.0
TOTAL		3,113	16,322	0.1

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits. Performance Incentive Calculation

Pursuant to Decision No. 75323, APS does not currently calculate net benefits or earn a performance incentive on energy savings from the APS System Savings Initiative.

Costs Incurred

There were no costs incurred for this program that are being collected through the DSMAC.

Consumer Education and Outreach

Not applicable.

Energy Codes and Appliance Standards Initiative

Description

The Energy Codes and Appliance Standards ("C&S") Initiative encourages energy savings by supporting better compliance with energy codes and appliance standards in jurisdictions throughout the APS service area by working with code officials, building professionals and other market actors to develop strategies for achieving better code compliance more cost effectively.

C&S can be one of most cost-effective ways of promoting EE. C&S activities may be utilized to deliver low cost energy savings while supporting Arizona building officials, the construction community, customers and stakeholders. APS supports C&S activities with a multifaceted approach that provides unbiased support, information, resources, and expertise to jurisdictions and trade allies within the APS service area.

- **Residential and Commercial Energy Codes** - Activities are intended to support building officials, the builder community, and interested stakeholders. Targeted activities include providing technical support, research, subject matter expertise, resources, and training. Training classes are customized to meet local jurisdictional needs and are based on the climate zone and code that is currently being adopted. The classes help to translate building code requirements into a process for builders to follow with subcontractors in the field to ensure that each trade knows their role in code compliance and how to properly install construction details to meet code.
- **Appliance Standards** - Activities target appliance standards where the efficiency standard for that appliance is being updated. APS quantifies savings created from recently updated standards where APS participated in the standard rulemaking or EE programs have helped create market demand and market readiness for new appliance standards in Arizona.

Utility programs are inextricably linked to building codes and appliance standards. Utility EE programs act as a catalyst to ready the market for new technologies or standards that are not currently common practice in the market place. By providing incentives, trade ally training and educating consumers, utility programs help to increase adoption of new energy efficient technologies and practices. Over time these practices become the commonly accepted business practice and the market adopts higher C&S as a result. While this helps to further the goal of energy efficiency, it also has a direct impact on the available market potential from utility programs. This is due to the fact that utility program savings are calculated using current building codes and appliance standards as the "baseline" for comparison.

In general, energy savings for utility program measures are calculated by taking the efficiency differential from the baseline product (typically represented by current building codes and appliance standards) as compared to the high efficiency product being promoted by the utility program. For example the APS Pools program promotes energy efficient variable speed pool pumps. When the program started in 2010, the pump savings were compared to a single speed pump as the baseline efficiency level. Starting in 2012, Arizona enacted a new appliance standard that sets dual speed pumps as the minimum efficiency requirement. As a result, the new 'baseline' for calculating variable speed pump savings is now based on a higher efficiency dual speed pump, since it is now the minimum efficiency level that someone can legally purchase. It also means that APS now counts less EE program savings from variable speed pumps based on this higher baseline efficiency level, even though customers who are replacing single speed pumps with variable speed will still see the full savings in their bills. Because of this, increases to building codes and appliance

standards can make it more difficult to cost effectively meet utility program EE goals without some consideration being given for code and standards changes in the EE rules.

Program Goals, Objectives and Savings Targets

The goal of the APS Codes and Standards Initiative is to promote increased energy efficiency in the APS service territory through advancement of building codes and appliance standards, including increasing code awareness and better code compliance. Savings are quantified through independent MER evaluation. During this reporting period, energy savings are being reported resulting from codes and standards efficiency increases in motors, general service lighting, T-12 lighting, Residential New Construction, Commercial New Construction, Residential HVAC and Title 44 requiring dual speed pumps with new and replacement pool pump installations.

Table 63 - Codes Initiative Goals and Objectives

Peak Demand Savings (MW)	Annual Energy Savings (MWh)	Lifetime Energy Savings (MWh)
7.1	31,536	395,117

*Based on 2015 program goals and objectives as approved in Decision No. 75323

Levels of Customer Participation

Participation levels are identified in APS’s Codes and Standards Report for 2015 issued by Navigant Consulting. This report will be submitted to the Commission in a subsequent filing.

Evaluation/Monitoring Activities and Research Results

Evaluation, monitoring, and research results are identified in APS’s Codes and Standards MER Report for 2015, as issued by Navigant Consulting. This report will be submitted to the Commission in a subsequent filing. MER activities included:

- Surveyed HVAC contractors regarding federal efficiency standards for HVAC equipment under 5 tons and impacts on stocking and selling practices.
- Updated lighting savings to include increased efficiency requirements for 700 series T8 linear fluorescent lamps, in addition to T12s.
- Quantified savings due to codes and standards for single-phase HVAC equipment, motors, residential and commercial new construction, pool pumps, general service lamps, and linear fluorescent lamps for 2015.
- Updated savings calculations for new construction based on new building code adoptions across all APS jurisdictions.
- Continued to review and update program Measure Analysis Spreadsheets and Analytic Database for C&S measures.

Problems Encountered and Proposed Solutions

No problems were encountered during this Reporting Period.

Program Modifications/Terminations

No programs or measures were modified or terminated during this Reporting Period.

Consumer Education & Outreach

See a list below of training initiatives supported by the APS C&S Initiative:

- 3/14/2015 Success with the 2012 IECC taught at the AZBO Spring Institute.
- 9/15/2015 Success with the 2012 IECC taught at the City of Goodyear facilities.
- 10/26/2015 ASHRAE 90.1 2010 Commercial Code class taught at the fall AZBO Institute.
- 10/27/2015 Success with the 2015 IECC taught at the AZBO Fall Institute.
- 11/18/2015 2015 Commercial Energy Code class taught as part of the Solutions for Business training series at the Wigwam Resort.

Outreach Initiatives include:

- APS was a corporate sponsor of the Association of Arizona Building Officials
- Sponsored and participated in the Spring and Fall AZBO Training Institutes
- Sponsored one residential and two commercial code training class in each AZBO Institute.
- Was a member of and participated in the Central and Grand Canyon Chapters of the IECC.
- Developed a new training curriculum targeted at teaching the requirements of the new 2015 residential energy code.
- Participated on the AZBO Education committee and assisted with the training schedules for both institutes.
- Coordinated an effort to become an intervenor in the Department of Energy's Notice of Proposed Rulemaking for vending beverage machines. APS filed a comment letter in these proceeding as part of a consortium of other utility partners.
- Met one on one with energy code jurisdictions to understand energy code challenges facing those code officials.
- Attended and participate in Maricopa County Association of Governments Building Codes Committee Meetings.

Other Significant Information

No other significant information to report at this time.

MER Adjusted Gross MW and MWh Savings

Table 64 - MER Adjusted Gross MW and MWh Savings - Building Codes and Appliance Standards Initiative

Measure	Annual Gross MWh Savings	Lifetime Gross MWh Savings	MW Peak Demand Savings
Residential New Construction	4,877	97,531	2.5
Commercial New Construction	6,517	130,349	2.0
General Service Lamps	21,405	42,809	3.1
Linear Fluorescents	7,969	119,536	2.0
Motors	2,248	33,724	0.8
HVAC	2,899	52,189	1.5
TOTAL	45,915	476,139	11.9

*Savings are adjusted for line losses (Energy 7.0%, Demand 11.7%) and a capacity reserve factor of 15%.

Benefits and Net Benefits/Performance Incentive Calculation

The MER adjusted net benefits and performance incentive are provided in Tables 6 and 8.

Costs Incurred

Costs incurred for this program during this Reporting Period are shown in Tables 2b and 2c.

IX. Measurement Evaluation and Research

Description

Navigant Consulting provides MER Services for APS's DSM programs. These Measurement and Evaluation activities include, but are not limited to:

- Performing process evaluation research to indicate how well programs are working to achieve their objectives;
- Performing impact evaluation research to verify that energy-efficient measures are installed as expected; measuring savings on installed projects to monitor the actual program savings that are achieved; and conducting research activities to refine savings and cost benefit models and identify additional opportunities for EE;
- Performing and tracking savings measurements to monitor the actual program savings that are achieved; and
- Researching additional opportunities for EE.
- Conducting bi-annual updates and maintenance of Measure Analysis Spreadsheets and Analytic Databases for all APS programs and measures. Updates include calculation of electric energy and demand impacts, natural gas impacts, water impacts, incremental equipment costs, and operation & maintenance (O&M) cost impacts.
- Assessing the broad market effects of the programs and the influence of the programs on non-participating customers, trade allies, decision makers and delivery channels for energy efficiency products and services. This includes net-to-gross research to assess the level of savings that can be attributed to the program outside of program participation and internal spillover.
- Updating and maintaining the Technical Reference Manual (TRM) savings algorithms, performance variables, and incremental cost assumptions for new and existing measures rebated through APS DSM programs as required in Commission Decision No. 73183.
- Assessing new and emerging technologies to support current and future program offerings.

The approach for measurement and evaluation of the DSM programs is to integrate data collection and tracking activities directly into the program implementation process.

The APS MER Verification Report for 2015, prepared by Navigant Consulting, will be provided as a separate filing.

**CERTIFICATION BY APS OF DSM ANNUAL PROGRESS REPORT FOR THE PERIOD:
JANUARY THROUGH DECEMBER 2015**

Pursuant to Decision No. 67744 (April 7, 2005), I certify that to the best of my knowledge and based on the information made available to me, the DSM Annual Progress Report is complete and accurate in all material respects.

2/27/16

Date



Stacy Derstine
Vice President and Chief Customer Officer

APPENDIX A



Memorandum

To: Roger Krouse, Sharon Connolly, James Wontor, Tom Hines (Arizona Public Service)

From: David Alspector, Molly Podolefsky, Daniel Layton (Navigant)

Date: November 16, 2015

Re: APS Prepay Program Updated Disconnect Analysis

This memorandum summarizes the findings of Navigant's updated analysis of customer disconnects while participating in the Prepay Program. Navigant expanded the analysis to include all 2,142 Prepay participants for which disconnect data was provided, rather than limiting the analysis to the 86 participants on which the previous analysis was based.¹ Although this results in a different population than that used to previously estimate total program impacts², expanding the population provides a more representative sample of Prepay participants on which to draw conclusions specific to disconnects. Navigant also analyzed the disconnect behavior of participants outside the program for comparison with disconnect behavior during the program. Table 1 summarizes characteristics of the populations used and findings from each analysis.

Compared to the previous analysis, the updated analysis found an increase in the percentage of customers experiencing disconnects during the program, the number of disconnects per participant, and the average annual hours of disconnect per participant. **Based on the updated analysis, the average Prepay program participant experiences 9 disconnects per year³, which translates to 36 hours of disconnection annually or 0.4% of all hours in the year.** Substituting this value for the 0.08% found in the previous analysis results in a Behavioral Effect (Conservation Effect less Disconnection and DSM Effect) of 7.16%. As shown in Table 2, this increase in the Disconnect Effect slightly reduces the Behavioral Effect from 7.48% derived in the previous analysis to 7.16% in this expanded analysis.

¹ These 86 participants were the subset of the program population who were matched to non-participants and used in the regression analysis to estimate overall program savings. The original research used just this subsample of 86 participants in the disconnect analysis as well.

² The original analysis performed regression-based billing analysis on the 86 participants who had sufficient pre-period billing data, and for whom the matching process was able to find close matches in the non-participant customer pool. This billing analysis estimated total program impacts to be 7.6%.

³ This is the average number of disconnects experienced by a program participant during participation in the program *scaled to a year*, to account for the fact that the typical participant was enrolled in the program less than a year.

Relative to inside the program, Prepay participants experience fewer disconnects outside of the program, but the events they experience are longer in duration. Navigant found that participants spend approximately twenty-nine percent more time disconnected during an average year inside the program relative to outside the program (0.31% outside the program versus 0.40% inside the program). This equates to an increase of approximately 8 hours disconnected annually. Although a smaller proportion of Prepay participants experience disconnects outside the program (10%) relative to inside the program (50%), and disconnect events are less frequent outside of the program (3.9 per year) relative to during participation (9.3 per year), participants experience disconnect events of shorter duration during the program. The average duration of disconnect outside of the program is 6.9 hours per event, compared to 3.7 hours per event during the program.

Table 1. Prepay Program Disconnect Analysis

	Original Disconnect Analysis (2014)	Updated Disconnect Analysis (2015)	Outside Program Disconnect Analysis (2015)
Period of Analysis	September 2012-October 2013	September 2012-October 2013	September 2012 - October 2013
Total Number of Participants Used in Disconnect Analysis	86	2,142	2,142
Number of Participants Experiencing Disconnect Used in Disconnect Analysis	18	1,020	1,020
Percentage of Participants Experiencing Disconnect	21%	50%	10%
Average Number of Disconnects per Year per Participant	less than 1 disconnect ^A	9 disconnects ^B	3.9 disconnects ^C
Average Hours Disconnected per Event per Participant	Not previously reported	3.7 hours	6.9 hours
Average Hours Disconnected per Year per Participant	7 hours	36 hours	27 hours
Percent of Total Yearly Hours Disconnected ^D	0.08%	0.40%	0.31%
Total Annual Energy Reduction per Participant (kWh) Due to Disconnect ^E	13 kWh	66 kWh	NA

^A In the original analysis, 18 participants were found to have experienced disconnect out of 86 participants analyzed, and of these 18 who experienced disconnect while in the program, 16 customers experienced only a single disconnect event, while two customers each experienced two disconnect events. Thus the average program participant experience less than one disconnect event.

^B Calculated as the average number of disconnects per program participant during enrollment in the program scaled to a year. Scaling is required because the typical program participant is enrolled in the program for less than a full year.

^C This number of disconnects experienced by program participants during the non-participation period is scaled to reflect what this number would be during a year of non-participation (a typical billing-year).

^D During program participation, this number is the percent of program hours (billing hours) in a year spent disconnected. For outside of the program, this number is the percent of annual billing hours spent disconnected. Both have been scaled to a year.

^E Calculated as the percent of program hours spent disconnected (0.08% or 0.4%) multiplied by the average pre-pilot annual energy consumption per participant of 16,488 kWh/year used in the 2014 analysis.

Source: Navigant analysis

Table 2. Calculation of Behavioral Effect

	Previous Analysis (2014)	Updated Analysis (2015)
Conservation Effect	7.59%	7.59%
Disconnect Effect	-0.08%	-0.40%
DSM Effect	-0.03%	-0.03%
Behavioral Effect	7.48%	7.16%

Source: Navigant analysis

The remainder of this memo is divided into the following sections:

- **Background** - providing context and high-level findings for the original 2014 disconnect analysis
- **Updated Analysis** - explaining improvements in the 2015 updated disconnect analysis along with key findings, and
- **Areas for Further Research** - characterizing areas for future refinement of the disconnect analysis

Background

In 2014, Navigant conducted research to determine the conservation effect⁴ attributable to APS's Prepay program using a billing analysis regression methodology. However, the results of the regression analysis included the reduction in energy usage due to customers having their power disconnected. Therefore, Navigant conducted a separate analysis to determine the percentage of total program hours during which participants' power was disconnected (i.e. the Disconnection Effect).

While Prepay program enrollment is maintained at roughly 2,000, the 2014 research team limited the disconnect analysis to the subset of 86 program customers participating in 2013 on which the main savings regression analysis had been run. While this approach is justifiable from the perspective that it maintains uniformity by conducting all analysis on the same sub-population, it has the downside of creating a very small sample size for the disconnect analysis. Only 18 participants in this regression population experienced a disconnect event during program participation, and so all disconnect analysis in the 2014 report was based on a sample size of 18 customers.

Updated Analysis

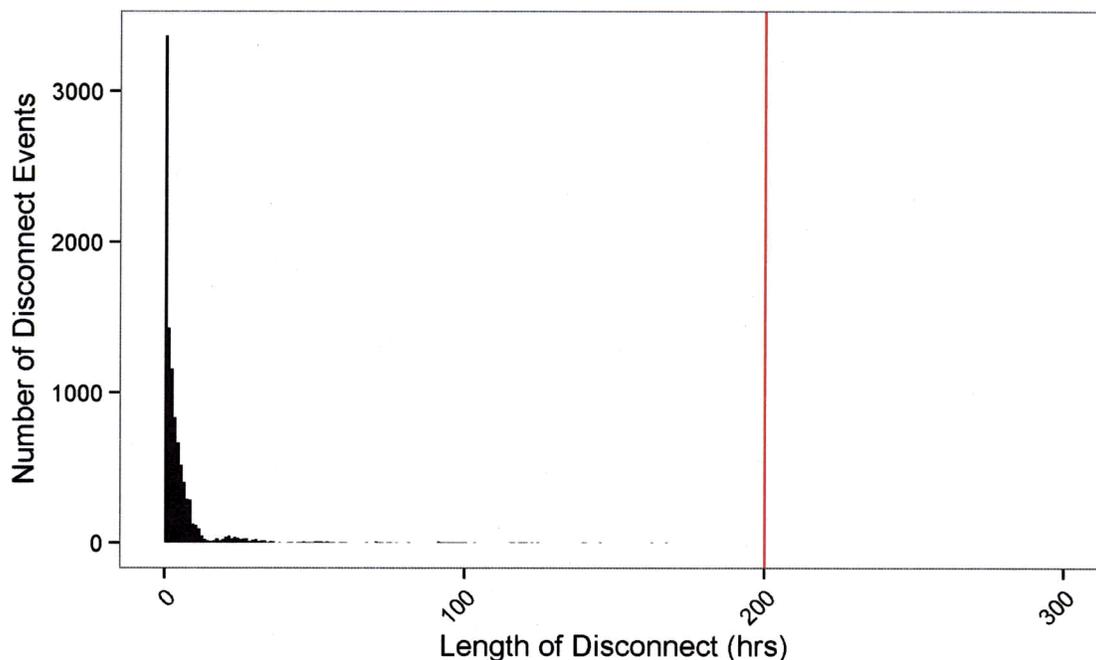
Navigant updated the disconnect analysis in 2015 to include the entire set of disconnect data for the pilot program population. Therefore, the 2015 analysis started from the entire population of 2,142 Prepay participants, rather than the regression sub-population. This analysis assumes that the estimation of the number of hours of disconnect is independent of the main Prepay savings regression analysis.

⁴ The total reduction in energy consumption associated with average participant enrollment in the Prepay Pilot.

Navigant first cleaned the data set to remove outliers and limit the analysis to those experiencing disconnects during their participation in the Prepay program. The Navigant team visually inspected distributions of both (a) the duration of disconnect events and (b) the number of disconnect events per participant appearing in the data for these 2,142 program participants. Based on visual inspection, the team removed outliers based on high duration and frequency of disconnects. Data points to the right of the red line in Figure 1 and Figure 2 represent outliers removed from the analysis.

Examination of the distribution of event duration past 24 hours (Figure 1) revealed a regular pattern of clustering around full days of disconnect (for example 3 days of disconnect, 4 days of disconnect, etc.). For this reason the team based cutoff for event duration at 200 hours, after which the regular pattern disintegrates (see Figure 3 in the Appendix for a close-up view of event duration beyond 24 hours). In addition, Navigant identified isolated observations of participants with greater than 40 disconnects (Figure 2), and therefore these participants were considered outliers. After outlier removal, the team limited the program disconnect analysis to disconnect events that occurred *while* the customer was enrolled in the program.⁵ This resulted in a final sample size of 1,020 Prepay participants (47% of total program participants) with disconnect events on which to determine the average duration of disconnect.

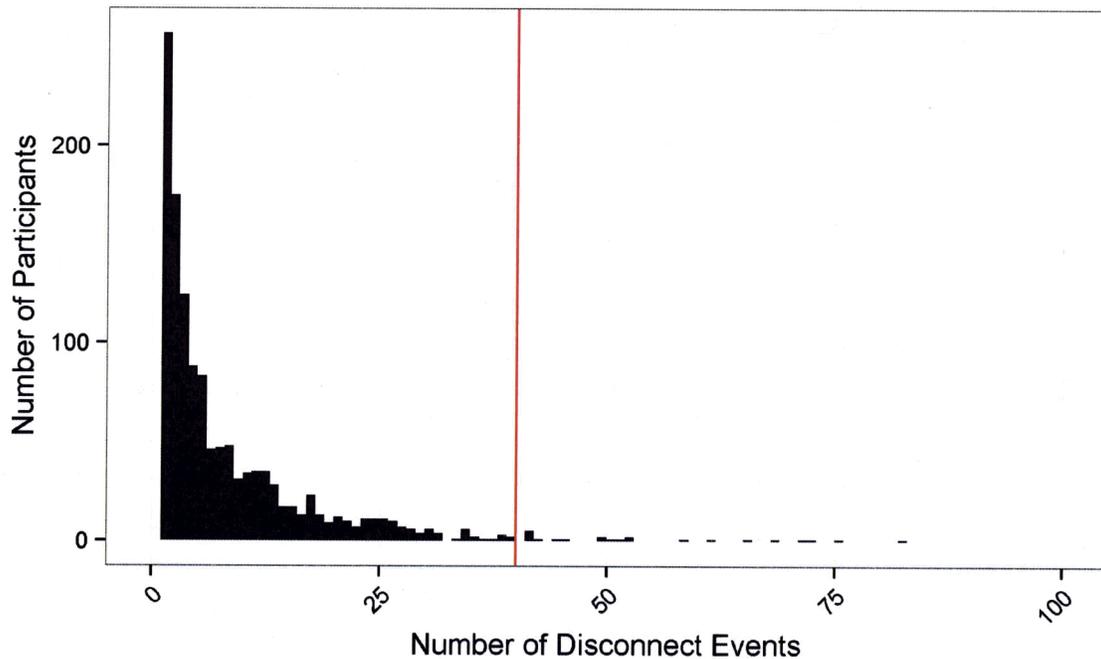
Figure 1. Duration of Disconnection Events



Source: Navigant analysis

⁵ The majority of program participants were not enrolled in the program for the entire year 2013, hence it was important to base analysis only on disconnect events they experienced while participating in the program.

Figure 2. Frequency of Disconnection Events per Participant



Source: Navigant analysis

Once the data was cleaned, Navigant calculated the percent of time the average program participant was disconnected during the program using the following steps.

First, Navigant determined the average hours of disconnect for each participant that experienced at least one disconnect (3.7 hours). Next, given most participants are enrolled for less than a calendar year, Navigant annualized this value by extrapolating the duration of disconnect during participation to an entire year⁶ (75.7 hours). Finally, Navigant summed the total annualized hours of disconnect for the population (75,987 hours) and divided by the total number of hours of participation in a calendar year (2,142 participants * 8760 hours per year = 18,763,920 hours). This resulted in 0.4% of disconnect time during program participation. Navigant followed a similar process to analyze hours of disconnect for each participant during the period of time spent outside of the program.

In summary, the key findings of Navigant's updated 2015 Prepay program disconnect analysis include:

- The average number of disconnects during participation by customers *with at least one disconnect event* is 1.0
- The average duration of a disconnect event among participants *with at least one disconnect event* is 3.7 hours

⁶ For example, if a participant experienced one hour of disconnect in the Prepay program in 2013, but only participated for two months (i.e. one-sixth of a year), that one hour was multiplied by six to calculate an annual disconnect of six hours

- The average duration of a disconnect event among participants *with at least one disconnect event during their time outside the program* is 6.9 hours
- The average annualized number of hours spent disconnected among participants *with at least one disconnect event* is 75.7 hours
- The average annualized number of hours spent disconnected among all Prepay participants is 35.5 hours
- The total annualized hours of disconnect by Prepay program participants is 75,987 hours
- The percent of Prepay program hours spent disconnected is 0.40%.
- The percent of total billing year hours spent disconnected by Prepay program participants *during their time outside the program* is 0.31%.

In addition, Navigant also plotted the number and duration of disconnect events by month (see Figure 5 and Figure 7 in the Appendix) and found the following:

- The duration of disconnect events tends to be longer in the winter, and shorter in the summer
- Disconnect events tend to be more frequent in the summer, and less frequent in the winter

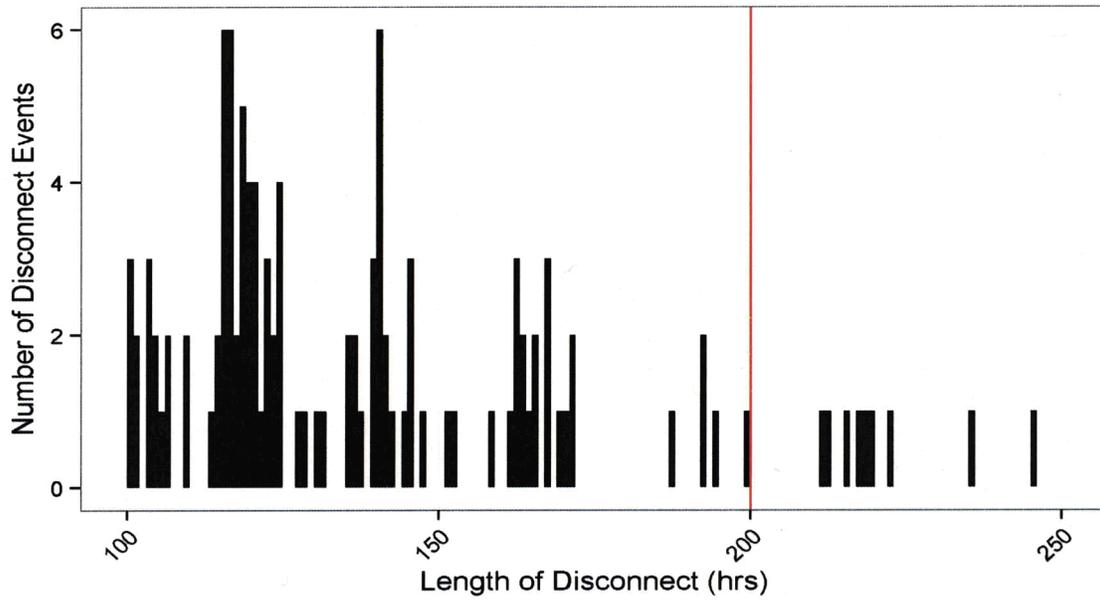
Areas for Further Research

While the updated disconnect analysis provides intuitively reasonable and econometrically justifiable results, the research team developed several considerations for future research:

- Investigate any feasibility constraints on the lower bound for disconnect length (for instance, restoring service might involve a process that takes some minimum amount of time), and if so adjust the outlier removal rules to remove low-duration outliers as well. The current analysis removes only high-use outliers in terms of disconnect duration and frequency.
- Determine seasonal impacts of disconnects. Navigant's current analysis assumes an hour of disconnect to have the same impact on energy consumption regardless of when it occurs and does not account for seasonal variation in disconnect duration and frequency.
- Determine the effects of duration or program participation on disconnect duration and frequency. The current disconnect analysis treats each observed hour of disconnect equally independent of participation duration.

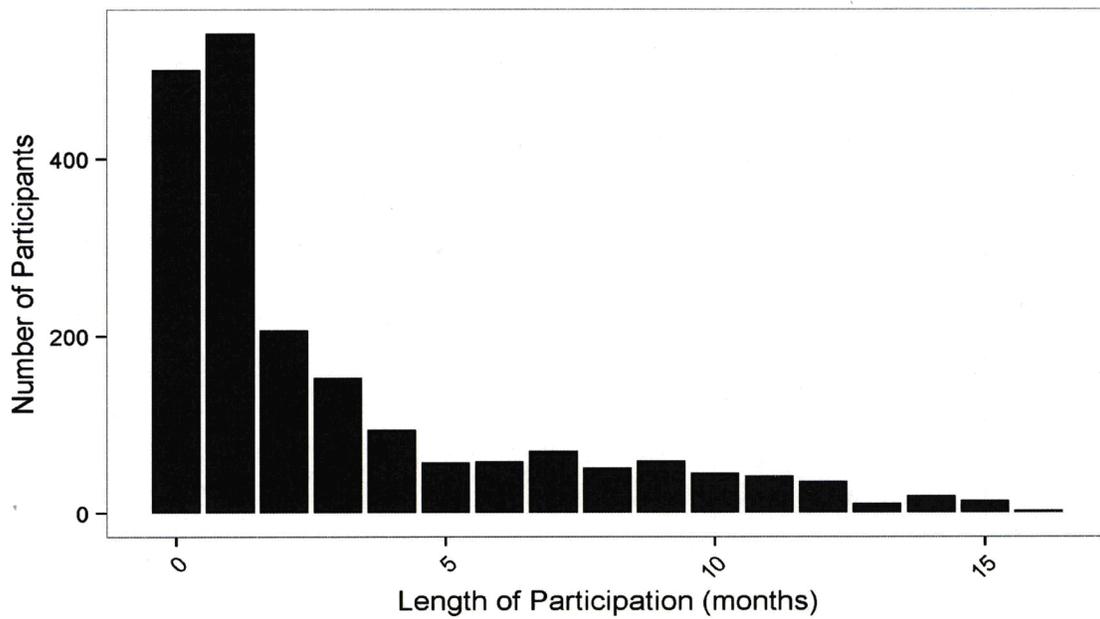
Appendix

Figure 3. Close-up: Duration of Disconnect Events



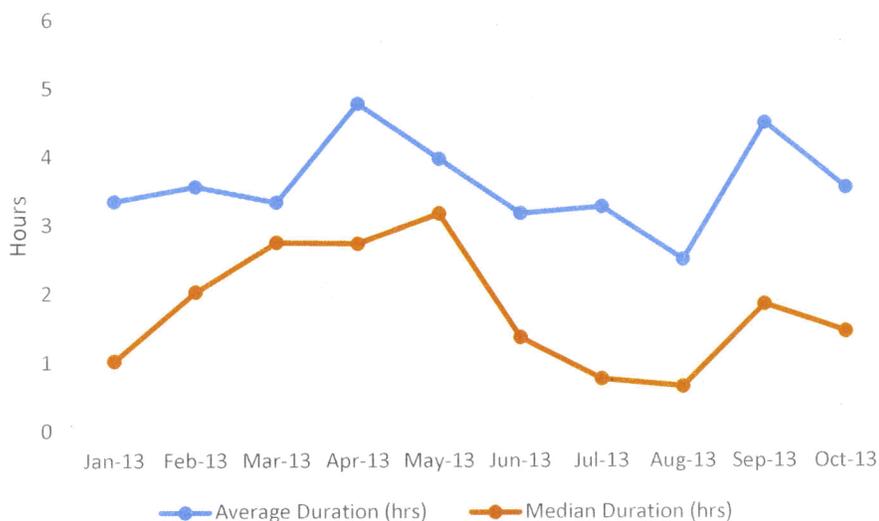
Source: Navigant analysis

Figure 4. Length of Program Participation by all Participants



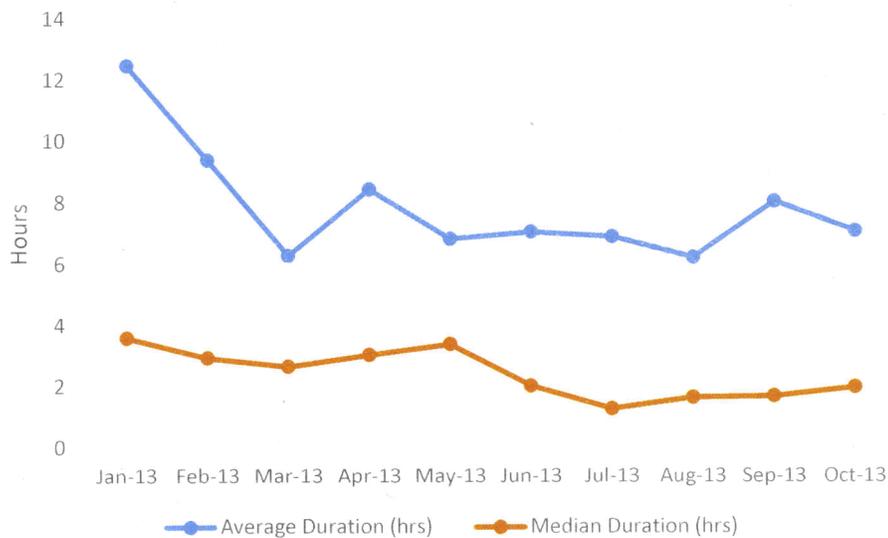
Source: Navigant analysis

Figure 5. Mean and Median Disconnect Event Duration by Month of Year in 2013, During Program Participation Period



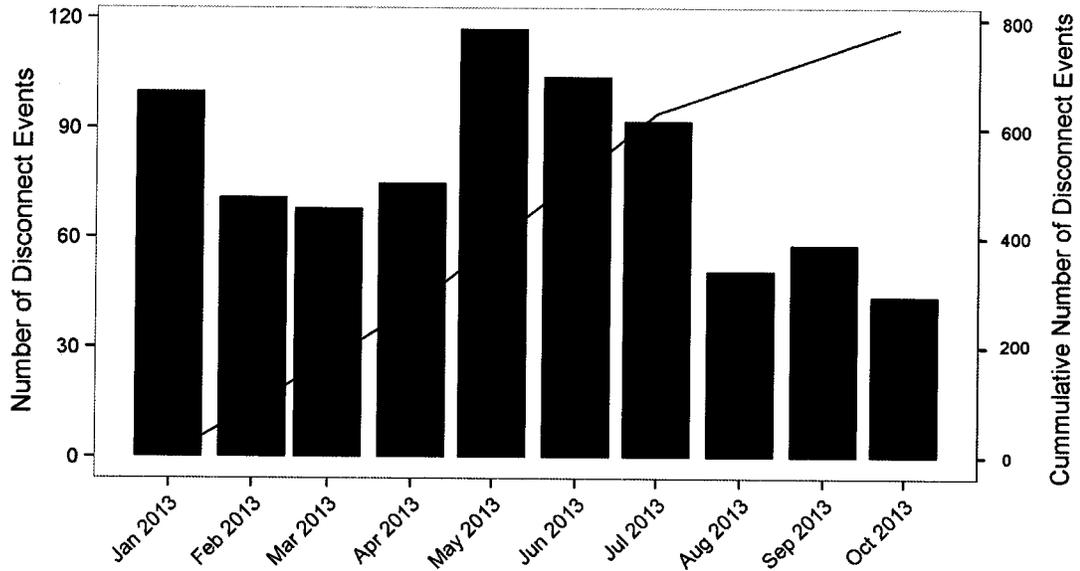
Source: Navigant analysis

Figure 6. Mean and Median Disconnect Event Duration by Month-of-Year, During Program Non-Participation Period



Source: Navigant analysis

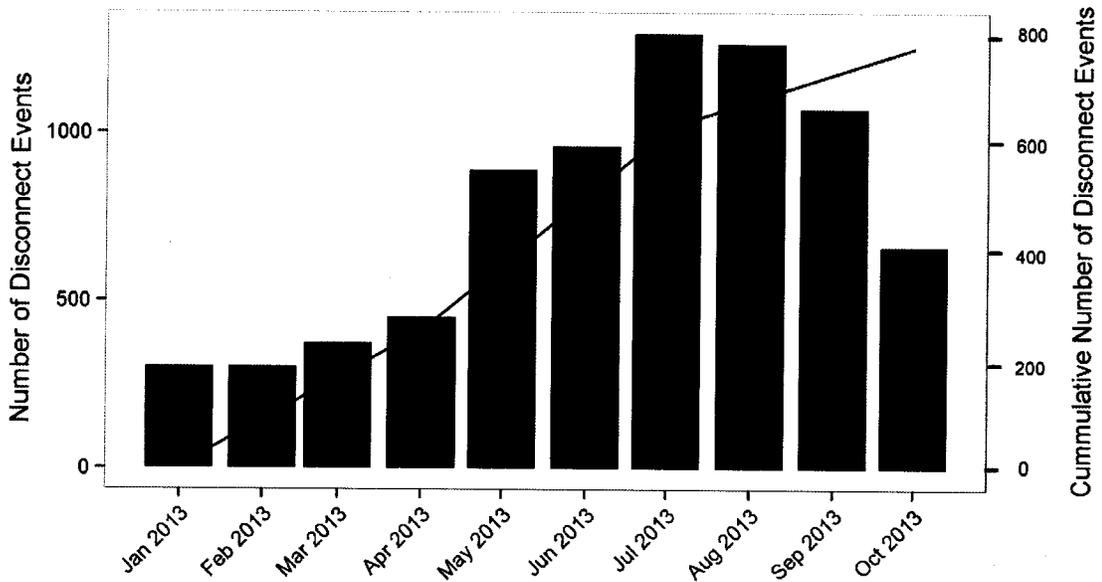
Figure 7. Distribution of Disconnect Events Used in Analysis



Source: Navigant analysis

Note: This figure is based on the disconnect behavior of program participants during the time they spent in the program.

Figure 8. Distribution of Disconnect Events Outside of Program Participation



Source: Navigant analysis

Note: This figure is based on the disconnect behavior of program participants during the time they were outside the program.