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9 **BEFORE THE ARIZONA CORPORATION COMMISSION**

11 COMMISSIONERS

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 15 ANDY TOBIN  
 16 BOYD DUNN

Arizona Corporation Commission

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16 IN THE MATTER OF THE APPLICATION  
 17 OF ARIZONA PUBLIC SERVICE  
 18 COMPANY FOR A RULING RELATING  
 TO ITS 2018 DEMAND SIDE  
 MANAGEMENT IMPLEMENTATION  
 PLAN.

DOCKET NO. E-01345A-17-0134

**APPLICATION FOR APPROVAL  
OF 2018 DSM IMPLEMENTATION  
PLAN**

19 Arizona Public Service Company (APS or Company) files its Demand Side  
 20 Management Plan (Plan) for 2018 in accordance with A.A.C. R14-2-2405 and Decision  
 21 No. 76204. The Plan outlines APS's approach to developing a DSM portfolio that better  
 22 meets system and customer needs by focusing on peak demand reductions, storage, load-  
 23 shifting and demand response programs in addition to certain traditional energy  
 24 efficiency measures. Consistent with prior Commission decisions, the Plan includes  
 25 storage initiatives, as well as programs for schools and limited income customers.  
 26 Overall the Plan is designed to implement, high-value demand side management  
 27 measures and energy efficiency measures that will benefit all customers in a cost-  
 28 effective manner. The objective is to maximize the value from DSM investments by

1 continuing to move APS's DSM portfolio towards programs and measures that address  
2 actual demand management and APS's changing resource needs and Arizona and  
3 regional energy conditions. This objective is consistent with the direction provided by  
4 the Commission when it approved APS's 2016 DSM Plan. Specifically, the  
5 Commission ordered "that Arizona Public Service Company, in its 2018 and future  
6 DSM Implementation Plans, further increase the focus on peak demand reductions  
7 (MW) from EE, DR, storage, and load management programs that reduce customer  
8 energy demand during the period of system peak demand." See Decision No. 75679 at  
9 19 (Aug. 5, 2016).

10 To accomplish this directive, the proposed Plan requests a budget of \$52.6  
11 million for 2018. Highlights of the Plan are briefly discussed below. The complete Plan  
12 is attached as Exhibit A.

13 **I. PROGRAM HIGHLIGHTS FOR 2018**

- 14 • Proposes a DSM portfolio that will produce an estimated 434,000 annual  
15 MWhs of energy savings, with a focus on program opportunities that help  
16 reduce summer peak demand and shift load to the midday in non-summer  
17 months to allow better integration of solar on the grid;
- 18 • Increases by \$1 million the funding for the Limited Income Weatherization  
19 Program, as directed in Decision No. 76313;
- 20 • Allocates an additional \$2 million in funding for the Demand Response,  
21 Energy Storage and Load Management (DRESLM) Program and related  
22 research as directed in Decision No. 76313 and expands this program to  
23 include commercial and industrial customers as appropriate;
- 24 • Expands DRESLM's focus to include an examination of pumped water  
25 storage and opportunities to save both energy and water in utility water  
26 delivery systems in APS's service territory in accordance with Decision No.  
27 76295;

28

- 1 • Proposes a new pilot program for Fleet, Workplace and Multi-Family  
2 Managed Electric Vehicle (EV) Charging Stations and an associated rate rider  
3 designed to recover program costs from participants;
- 4 • Proposes additional funding for energy efficiency and demand response  
5 programs for schools, as well as a pilot program for School EV Buses;
- 6 • Proposes the addition of new measures in the Home Performance with Energy  
7 Star Program, including free smart thermostats and direct install water heater  
8 timers for customers who participate in the in-home energy audit program and  
9 participate in the voluntary demand response program;
- 10 • Proposes two new pilot measures within the Residential New Homes  
11 Construction Program, including grid connected water heaters and EV charger  
12 pre-wiring to make homes EV ready;
- 13 • Proposes reverse demand response and load shifting pilot measures, including  
14 a reverse demand response pilot for large customers with dispatchable load of  
15 at least 30 kW;
- 16 • Modifies certain existing programs and measures to better align the Plan with  
17 resource needs, increase peak reductions, rather than just energy savings, and  
18 reduce certain incentives further to reflect market conditions; and,
- 19 • Proposes to terminate incentives for all lighting measures<sup>1</sup> and residential pool  
20 pumps, and certain non-residential measures including refrigeration, certain  
21 motors, and some non-residential controls to reflect the maturity of the market  
22 for these technologies and reduced need for incentives to promote their  
23 adoption, as well as their lack of alignment with APS resource needs.

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28 <sup>1</sup> Certain lighting measures will be maintained for consumer education, limited income and schools programs only.

1 **II. THE PLAN IS FOCUSED ON HIGH VALUE DSM DESIGNED TO MEET**  
2 **SYSTEM AND CUSTOMER NEEDS, RATHER THAN SIMPLY**  
3 **COMPLIANCE WITH THE ENERGY EFFICIENCY STANDARD (EES)**

4 The Plan is anticipated to obtain first year energy savings in 2018 of 434,000  
5 MWh, which is about 15% less than the 2018 goal of 508,893 MWh based on Decision  
6 No. 75679. The anticipated 434,000 MWh of savings in 2018, combined with the on-  
7 going savings to date from measures installed in 2011 through 2017, comprise  
8 approximately 15.9% of APS's forecasted 2017 retail sales putting APS slightly behind  
9 the cumulative energy savings goal from the EES Rules and the path approved in  
10 Decision No. 75679.

11 APS requests a waiver of the compliance standard for 2018 in accordance with  
12 A.A.C. R14-2-2419. Good cause exists for this waiver because as discussed in Section  
13 II B of the Plan (Changing Resource Needs and DSM Opportunities), traditional energy  
14 efficiency measures focus primarily on saving kWh in order to achieve a pre-set energy  
15 standard, without recognition of distinct differences for the time value of energy savings.  
16 Overall the Plan maximizes value for customers and better aligns the portfolio of  
17 programs and measures with system and resource needs. It represents a more strategic  
18 way of deploying DSM than a Plan designed primarily to achieve high kWh savings to  
19 meet an arbitrary standard. For these reasons, and given the ongoing policy discussions  
20 regarding how energy efficiency and demand response fit into Arizona's overall energy  
21 policy, a waiver of the EES standard in A.A.C. R14-2-2404 is warranted.<sup>2</sup>

22 In addition, APS requests that the Commission continue the waiver granted in  
23 Decision No. 76313 of the 10 percent cap on the amount of energy savings that can be  
24 counted from demand response and load management programs. This waiver is needed  
25 to allow APS to continue to count all savings resulting from approved programs towards  
26 the energy saving goals.

27  
28 <sup>2</sup> APS notes that based on the Plan as currently proposed it does not anticipate being eligible for any performance incentive.

1 **III. APS REQUESTS A BUDGET OF \$52.6 MILLION**

2 APS's proposed budget of \$52.6 million maintains its focus on providing  
3 customers with valuable savings opportunities while also benefiting the electric system  
4 by better aligning APS's DSM portfolio with system resource needs. Table 1 below  
5 reflects the sources of revenue to support this Plan and budget.

6 Table 1: Revenue Sources for Proposed 2018 DSM Budget

7

| Revenue Source  | Budget Contribution<br>(rounded) |
|---|----------------------------------|
| Base Rates  | \$20,000,000                     |
| DSMAC   | 23,549,000                       |
| Collected, but unspent funds<br>& Gains on Sale of Assets | 9,087,000 <sup>3</sup>           |
|   | <b>\$52,636,000</b>              |

10

11

12 **IV. MANAGED EV CHARGING PILOT PROGRAM AND EXPERIMENTAL**  
13 **RIDER TO RECOVER COSTS ASSOCIATED WITH EV CHARGING**  
14 **STATIONS**

15 The Plan requests approval of the Managed EV Charging Pilot Program designed  
16 to support the development of electric vehicle fleets in APS's service territory and  
17 managed charging stations for fleets, workplaces and multi-family housing  
18 communities. See Attachment 1 to Exhibit A for a complete description of the pilot  
19 program. This program is unique. It will allow APS to schedule the charging of these  
20 EVs in a manner that avoids charging during peak hours, optimizes savings for  
21 customers and maximizes system efficiency.

22 The total budget requested for this pilot program is \$1.33 million. These funds,  
23 which will be collected through the DSMAC, will be used to purchase and install the  
24 charging stations and related controlling mechanisms, as well as provide education,  
25 marketing and administrative support. APS will own and manage the charging stations.  
26 Participating customers will repay the funds used to purchase the chargers over a ten

27 <sup>3</sup> This line includes (i) the previously approved and allocated \$4 million for DRESLM program, (ii) \$5  
28 million approved in the recent APS rate case, Decision No. 76295, for customer education and tools to  
assist customers with the transition to more advanced rates, and (iii) a \$87,000 gain on the sale of assets  
that is being returned to customers through the DSMAC.

1 year period, less an incentive of \$750 per station. The repayment funds will be credited  
2 back to the DSMAC.

3 The Experimental Rider Schedule Electric Vehicle Charger-General Service  
4 (EVC-GS), which is Attachment 2 to Exhibit A, describes the specific terms and  
5 conditions applicable to the repayment and sets the monthly repayment charge. APS  
6 requests that the Commission approve this experimental rider.


7 **V. CONCLUSION**

8 APS respectfully requests that the Commission expeditiously approve this  
9 Application, specifically including the following:

- 10 1. Approve APS's 2018 DSM Plan in its entirety as discussed herein and in  
11 Exhibit A;
- 12 2. Approve a waiver of the compliance standard in A.A.C. R14-2-2404 for  
13 2018 and a waiver of the 10 percent cap in A.A.C. R14-2-2404(c) so that APS may  
14 count all savings from demand response and load management programs;
- 15 3. Approve the Experimental Rider Schedule EVC-GS; and,
- 16 4. Approve a 2018 budget of \$52.6 million and reset the DSMAC to collect  
17 \$23,549,000 in 2018.

18 RESPECTFULLY SUBMITTED this 1st day of September 2017.

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By:   
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Thomas L. Mumaw

Attorneys for Arizona Public Service Company

1 ORIGINAL and thirteen (13) copies  
2 of the foregoing filed this 1st day of  
3 September 2017, with:

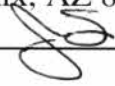
4 Docket Control  
5 ARIZONA CORPORATION COMMISSION  
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8 COPY of the foregoing mailed/delivered this  
9 1st day of September 2017 to:

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# Exhibit A





**Arizona Public Service  
Company**

**Demand Side Management  
Implementation Plan for  
2018**

**September 1, 2017**

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18

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## I. Executive Summary

The Arizona Public Service Company (APS or Company) 2018 DSM Implementation Plan outlines the Company's plans for achieving energy and load management savings through cost effective demand side management programs in accordance with Arizona's Electric Energy Efficiency Standards A.A.C. R14-2-2401 et seq.

The current portfolio of DSM programs has resulted in over 4,800,000 MWhs in energy savings for APS customers since 2005 while producing sustained market transformation that has helped decrease costs and increase the availability of energy efficiency products and services in Arizona. The programs have been successful to date, but it is important to continually assess the DSM portfolio to ensure that it remains aligned with resource needs and continues to have a meaningful impact in driving ongoing market adoption to ensure a sound investment of customer dollars.

In Decision No. 75679, APS was ordered to re-evaluate DSM programs to focus on reducing peak energy use and demand. As part of this effort, APS reassessed each DSM measure in terms of its relative value in providing a load shape of savings that aligns with system resource needs. In today's changing energy markets, not all kWh savings are equally valuable – while on-peak savings are still highly valuable, off-peak savings offer considerably less benefit to the utility in terms of resource management. This reflects the changing resource conditions in the region that are causing 'duck curve' load shape issues and reduces the demand for non-renewable generation. These challenges are increased when energy efficiency programs further reduce load during midday non-summer hours when regional solar production peaks.

Management of the energy grid is becoming increasingly complicated during certain times of the day as increasing amounts of intermittent resources are integrated onto the grid. These are not the time periods when energy efficiency offers the greatest value. Instead, focused energy efficiency during summer peak demand hours can help reduce the demand for renewable and non-renewable generation and may delay the need for additional, future infrastructure, for the benefit of all customers. The focus, as the Commission noted in Decision No. 75679, needs to be on shifting energy use away from peak times to off-peak times.

The 2018 Plan is designed to address these changing circumstances. The objective is to maximize customer value from DSM investments by not focusing merely on accumulating kWh reductions but by evolving the portfolio to address existing system conditions and embrace promising new technologies. Energy efficiency continues to be a vital part of the APS resource portfolio; however, we can deliver higher value by also using other demand side tools like load shifting, electrification and reverse demand response to help smooth system load shapes and shift energy use into midday hours when energy prices are low or negatively priced. This perspective also recognizes the value of modernized rate structures that better align with system needs by providing rate signals that reward customers for reducing demand and on-peak energy use with less need to rely on ratepayer funded incentive programs. This is a smarter, more holistic, approach to DSM planning that helps create a more flexible resource portfolio to drive DSM savings for customers while also enabling the continued integration of solar resources onto the grid and optimizing the potential for customer value from the negatively priced wholesale energy market.

The result is a 2018 DSM Plan that 1) focuses on delivering highest value peak demand savings and greater resource flexibility for managing the duck curve, 2) positions for the future with new DSM technologies, and 3) transitions away from some energy efficiency technologies where the market is transformed and customer funded incentives are no longer needed to drive adoption. These responsive changes help pave the way for DSM to continue to provide valuable savings for customers, while remaining an effective resource for APS to serve all customers into the future.

## **II. Introduction**

The 2018 DSM Plan provides a balanced mix of programs targeted to address APS's diverse customer segments and market opportunities for both Residential and Non-Residential customers. These programs are expected to produce high value energy and demand savings in 2018. As discussed herein, the 2018 Plan proposes 1) to continue previously approved programs with some modifications, 2) to terminate measures that do not align with APS resource needs or where the market is transformed to the point that customer funded incentive are no longer needed, 3) to introduce new emerging DSM technologies, and 4) to focus program efforts on the highest value DSM opportunities.

### **A. Highlights of the Plan**

- Discusses changing resource needs, opportunities for DSM programs to assist with integration of intermittent resources, including solar on the grid and the need to better consider the value of load shifting and peak demand reductions.
- Requests continuation of EE and DR programs approved in the most recent DSM Implementation Plan with program modifications as proposed in this plan.<sup>1</sup>
- Proposes two new pilot programs for Non-Residential Managed Electric Vehicle (EV) Charging and School EV Buses.
- Proposes one new DSM measure and four new pilot measures including: no-cost smart thermostats, direct install water heater timers pilot, grid connected water heaters pilot, EV ready new homes pilot, and a reverse demand response pilot measure.
- Increases funding for the limited income weatherization program in accordance with Decision No. 76313, and requests program modifications designed to better serve this targeted customer group.
- Increases funding for the Demand Response, Energy Storage and Load Management program (DRESLM), expands the program to include non-residential customers, and adds a new focus on examining pumped water storage and opportunities to save both energy and water in utility water delivery systems in accordance with Decisions Nos.76314 and 76295.
- Terminates incentives for residential and non-residential lighting measures, residential pool pumps, non-residential refrigeration, some non-residential motors, and some non-residential controls due to the rapid advancement in the market for these technologies and reduced need for incentives to promote their adoption, as well as the need to focus programs on DSM opportunities that better align with APS resource needs.

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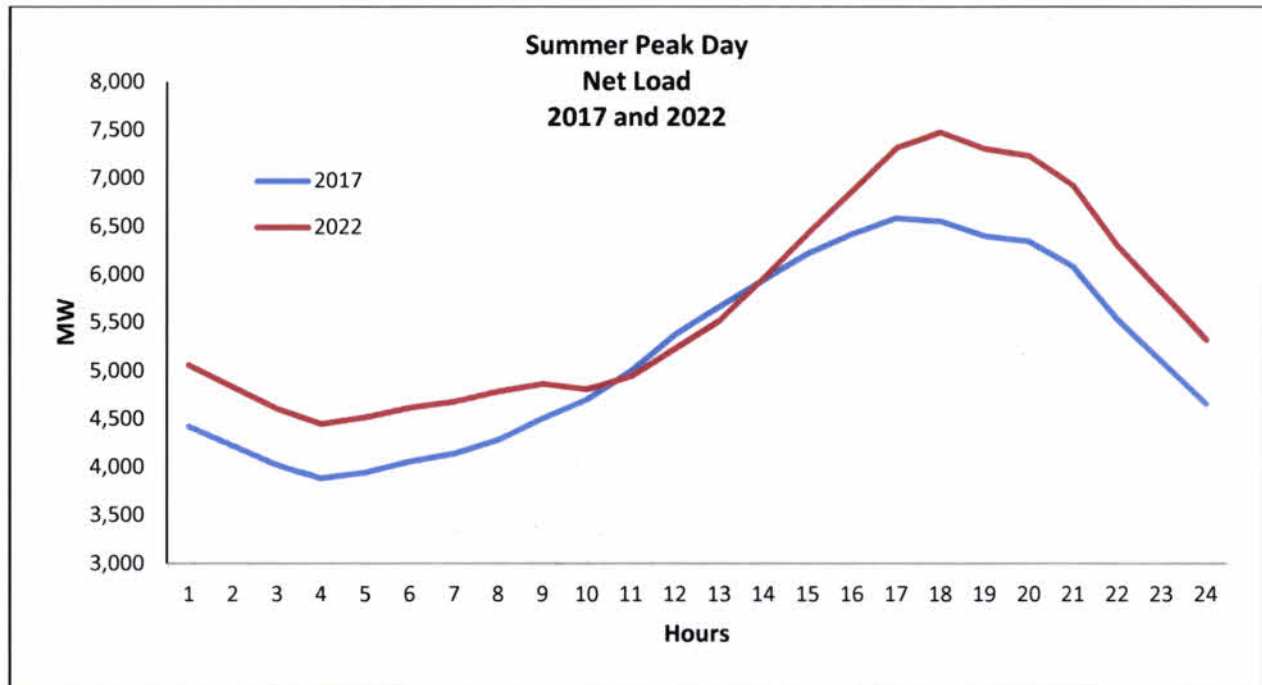
<sup>1</sup> Decision No. 76313 (August 24, 2017).

- Reduces incentives for a number of measures, and continues with the reduced incentives ordered in Decision No. 76313.
- Proposes a high value DSM portfolio that will produce an estimated 434,000 annual MWhs of energy savings, with a focus on program opportunities that help reduce summer peak demand and shift load to the midday in non-summer months to allow better integration of solar and other intermittent resources on the grid.
- Proposes a budget of \$52.64 million and reduces the current DSM Adjustor Charge (DSMAC), while funding the Demand Response, Energy Storage and Load Management program with up to \$4 million of collected but unspent funds from the DSMAC balancing account in accordance with Decision No. 75679, and funding the rate transition education initiative with up to \$5 million of collected but unspent DSMAC funds in accordance with Decision No. 76295.

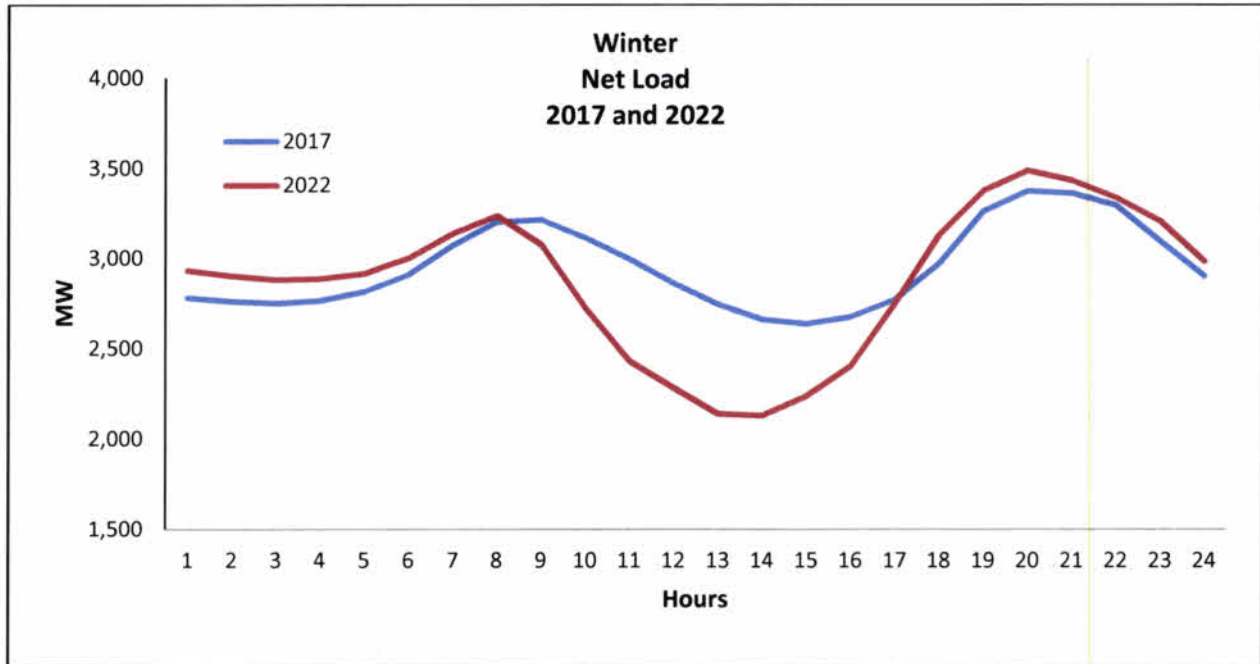
**B. Changing Resource Needs and DSM Opportunities**

To maximize the value of DSM as a resource, APS strives to align DSM programs with APS resource needs. Figure 1 and Figure 2 below show APS system net load shapes for typical summer and winter months in 2017 and 2022. These can be used to inform where DSM can be most valuable to customers as a resource. While peak summer energy needs continue to grow during the summer, the more mild non-summer months do not see the same load growth. These non-summer months pose a different resource challenge due to the penetration of solar during low load periods. During these times APS faces challenges on two fronts: first in keeping enough generation online during the middle of the day to be able to meet evening ramp and peak needs, and second because it limits opportunities to take advantage of negative priced events – which can benefit all customers by putting downward pressure on rates while helping to integrate renewable generation.

**Figure 1 – APS Net System Summer Load Shape (2017 and 2022)**

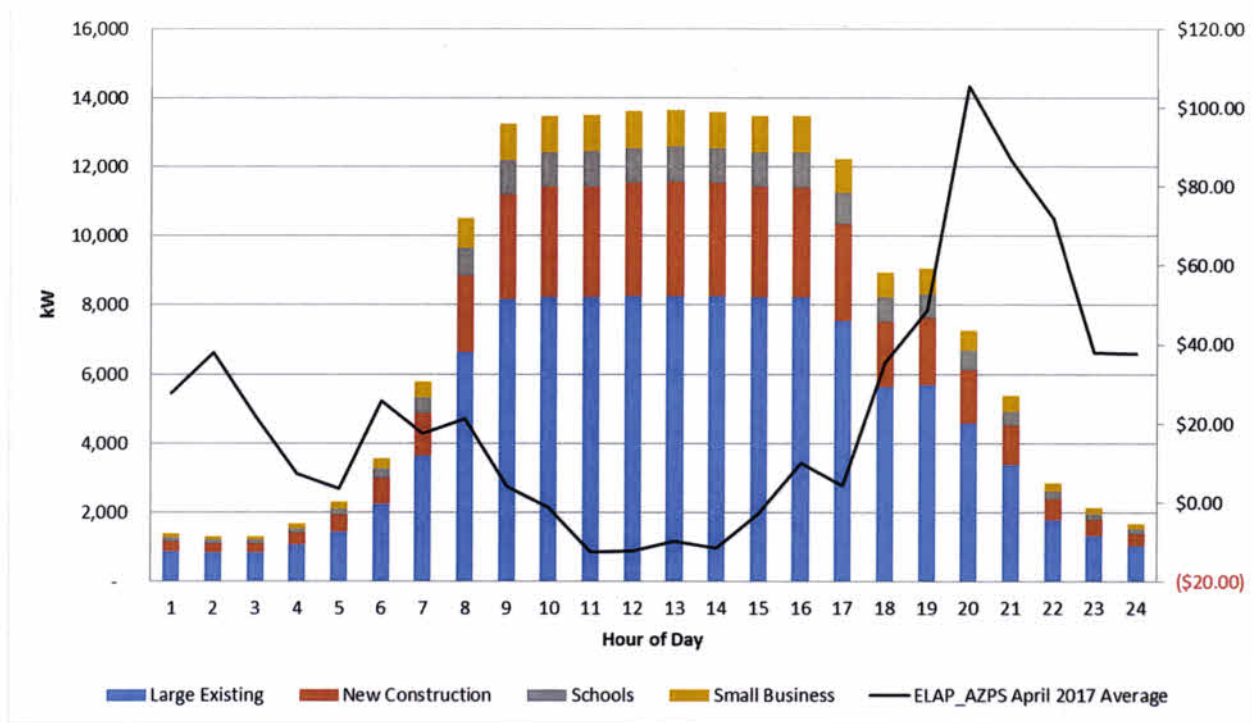


**Figure 2 – APS Net System Winter Load Shape (2017 and 2022)**



Considering these changing resource needs, it’s clear that focusing DSM on reducing summer peak demand provides the highest resource value to customers going forward. In addition, a new opportunity now exists within DSM to strategically build load in the middle of the day through load shifting, vehicle electrification, and reverse demand response. To illustrate the point, see Figure 3 below. The black line on the graph shows the real time hourly market prices for APS in April 2017, with hourly prices shown on the right side Y-axis and hours of the day shown on the X-axis. It shows such persisting negative prices in real time that the hourly price during the highest solar production period is negative in many hours of the month, particularly during hours 10 through 15 (10am to 3pm). The opportunity for APS to take advantage of negative pricing is real today. The ability for customers to benefit from this is real, today. Also, from a regional perspective, given renewable targets in both California and Arizona (or, the region) and the likely continued deployment of solar resources, this opportunity is likely to increase. Thus enhancing DSM to capture this value for customers is prudent. In addition, the bars on the graph show savings shapes for interior LED lighting measures in the APS non-residential programs, which show most savings occurring during times when prices are very low or negative. Continuing to promote EE savings during the middle of the day, when prices are shown as below, can actually harm customers by limiting the ability to take advantage of negative pricing.

**Figure 3 – April 2017 Hourly Market Prices and Example DSM Savings Load Shape**



To focus on the highest value savings, the DSM portfolio needs to evolve to align with these changing resource needs by placing greater emphasis on programs that reduce energy use during summer late afternoon and early evening hours. By contrast, there should be less emphasis placed on energy savings that occur during midday on non-summer days when energy is low cost and abundant on the system. In fact, to align with changing resource needs, load management programs that *shift* consumption into the period of peak solar production (10am-2pm) during non-summer months are particularly valuable to the system because they can have the benefit of both reducing total costs of serving load by taking advantage of abundant low to negative cost energy, and also increasing the ability of the grid to accept more renewable energy.

Recognizing the need to reassess the DSM portfolio and make changes to reflect current circumstances, Decision No. 75679 ordered that “Arizona Public Service Company, in its 2018 and future DSM Implementation Plans, further increase the focus on peak demand reductions (MW) from EE, DR, storage and load management programs that reduce customer energy demand during the period of system peak demand.”

In response to this Order, APS re-analyzed each DSM technology according to the profile of annual savings that it typically provides and the daily and seasonal load shape of savings it produces. In addition to traditional cost-effectiveness, each DSM measure was also assessed according to the amount of savings it provides during high value summer weekday 3-8pm on-peak hours, and by the amount of savings it provides during low value midday periods from 10am-3pm October through April. To create a high value DSM portfolio in 2018, APS focused on measures that provide savings during on-peak hours that align with APS resource needs, while de-emphasizing or terminating measures that provide savings when excess solar production creates an overabundance of energy in the region and EE savings have limited value on the grid. The results of the load shape analysis are provided in Appendix A, and in work papers submitted to Staff.



As a result of this analysis and in recognition of short customer paybacks for many measures such as residential LED lighting, APS has developed a proposed DSM portfolio for 2018 that offers a better path towards emerging high value distributed energy resource opportunities in response to Decision No. 75679. It transitions the portfolio of programs to reduce spending on technologies that do not produce the most favorable energy saving load shapes and where the market is rapidly transforming to the point where incentives are not needed (i.e. LED lighting). The proposed plan focuses program efforts towards emerging energy efficiency, energy storage and peak demand management program opportunities that will drive market adoption, provide high value to customers, and align better with current and future system resource needs.

As system resource needs are changing, exciting opportunities are emerging with new technologies that offer customers unprecedented capabilities for conveniently monitoring and controlling their energy use and peak demand. The new strategic direction APS is proposing will reward customers for conserving energy when demand on the grid is highest, to the benefit of all customers. It also will encourage customers to use energy when it is abundant and less expensive, such as the middle of the day when solar production is the highest. Combined with new, modernized rate plans, we are taking an innovative approach to helping customers save money while optimizing the deployment of renewable, non-renewable, and grid resources.

As recognized in Decision No. 75679, the future of DSM involves an integrated approach to distributed energy resources (DERs) for managing energy demand and shifting load on the grid. In such a changing environment, it is important to maintain an open dialogue about how DSM can be flexibly applied to better value the benefits of load management in meeting resource needs and achieving credit toward EE goals.

### III. 2018 Estimated Savings Goal

At the end of 2017, APS estimates that the portfolio of ACC approved DSM programs will have saved 3,969,981 MWhs towards an estimated compliance goal of 6,335,573 cumulative MWhs in 2020 (22% of APS' estimated 2019 retail sales of 28,798,057 excluding losses and sales to Freeport McMoran facilities that are exempt from the EES). APS calculated the savings goal for 2018 by using the 'smoothed compliance' approach approved in Decision No. 75679, which first subtracts the pre-EES savings credit of 838,913 MWhs from the total MWhs remaining in the EES, then divides total remaining cumulative compliance MWhs by the number of years left until 2020. Using this smoothed compliance approach, the goal for the 2018 DSM Plan is 509,000 MWhs. See the calculation below for more details. This calculation produces a lower MWh goal in 2018 as compared to the 2017 goal due to a lower retail sales forecast through the period.

#### Calculating Smoothed Compliance Goal for 2018

**Estimated 2019 retail sales** (excl. losses, Freeport McMoran sales) = 28,798,057 MWhs

**Total 2020 cumulative savings goal** (22% of 2019 retail sales) = 6,335,573 MWhs

- Minus Credit for Pre-EES savings (from 2005-2010) = 838,913 MWhs
- Minus Estimated EES Savings from 2011-2017 = 3,969,981 MWhs

**Total remaining savings** = 1,526,679 MWhs

**2018 Savings Goal** =  $1,526,679 \div 3$  years remaining in the EES = **508,893 MWhs**

In 2018, APS expects to achieve savings of 75 MW and 145,000 MWh from Residential DSM programs, 21 MW and 80,000 MWh from Non-Residential DSM programs, and 45 MW and 209,000 MWhs from DSM Initiatives. In total, the Plan is forecast to save a total estimated first year 434,000 MWh of energy (rounded to the nearest 1,000 MWh). This is an addition to the total savings of 3,970,000 MWhs from 2011 through 2017, for total estimated savings of 4,404,000 MWhs by the end of 2018.

The EE Rules require that the Company's Plan include a description of APS's compliance with the requirements of the EE Rules for the previous calendar year.<sup>2</sup> APS's DSM program results for 2016 are fully described and documented in the Company's Demand Side Management Annual Progress Report ("2016 DSM APR"), which APS filed with the Commission on March 1, 2017.<sup>3</sup> The Annual Progress Report with results from 2017 will be filed by March 1, 2018.

Prior to the filing, APS reviewed this Plan with various members of the DSM Collaborative group whose membership includes DSM experts, stakeholder representatives, the Residential Utility Consumer Office and Commission Staff.

## **IV. Demand Side Management Portfolio**

APS's proposed DSM program portfolio for 2018 includes the following programs. (For more information see the Description of Previously Approved DSM Programs in Appendix B):

### Residential Programs

- (1) Consumer Products;
- (2) Existing Homes HVAC;
- (3) Home Performance with ENERGY STAR;
- (4) Residential New Construction;
- (5) Low Income Weatherization;
- (6) Conservation Behavior;
- (7) Multi-Family Energy Efficiency;

### Non-Residential Programs (Solutions for Business)

- (1) Large Existing Facilities;
- (2) New Construction and Major Renovation;
- (3) Small Business;
- (4) Schools;
- (5) Energy Information Services;
- (6) Schools EV Bus Pilot (New proposed pilot program for 2018);
- (7) Managed Electric Vehicle Charging Pilot (New proposed pilot program for 2018)

### Demand Side Management Initiatives

- (1) Demand Response;
- (2) Building Codes and Appliance Standards;
- (3) APS System Savings;
- (4) Energy and Demand Education;

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<sup>2</sup> A.A.C. R14-2-2405(B).

<sup>3</sup> See Docket No. E-00000U-15-0553

- (5) Energy Storage and Load Management (DRESLM);
- (6) Load Management Technologies Pilot;
- (7) T&D Pilot;

APS intends to continue the already approved programs which were approved in the most recent DSM Implementation Plan.<sup>4</sup> This Plan addresses proposed program modifications and additions to the DSM portfolio.

## **A. RESIDENTIAL DSM PROGRAMS**

### **Proposed Program Modifications**

#### **1. Consumer Products Program**

APS proposes to terminate incentives for residential LED lighting in the 2018 DSM Plan. Due to advances in LED technology, long bulb lifetimes and rapidly declining prices, these bulbs are quickly becoming the preferred consumer choice without the need for customer funded incentives. In fact, the retail price for some LEDs has fallen to less than \$2 per bulb before incentives. With expected savings of over \$7 per year in energy costs, it takes less than 4 months to pay back the investment, without the need for rebates. The proposed program design for 2018 would terminate incentives for retail discounts on LED lightbulbs beginning on January 1, 2018. APS will continue educating customers on the benefits of adopting LED lighting technology by retaining 100,000 LED giveaway bulbs in the program for use at community events and in targeted limited income customer outreach.

For the pools program element, APS proposes to terminate incentives for variable speed pool pumps beginning on January 1, 2018. Due to the success of the program in transforming the pool pump market in Arizona, as well as the state's appliance standard that requires all pool pumps sold to be at least dual speed, variable speed pumps have become the market standard which no longer require ongoing customer incentives. In fact, SRP recently discontinued their incentives for variable speed pumps due to their wide adoption. In addition, pricing for variable speed technology has recently decreased; with some variable speed pump models now available for less than \$700 (approximately half the cost of a variable speed pump when the APS variable speed pool pump measure was introduced). With these lower costs, there is typically less than a 2 year payback for customers in energy savings to offset the incremental cost of upgrading a pump replacement to a new variable speed pool pump. APS has included some pool pump incentives in the 2018 plan since we intend to honor incentives for any pumps installed before the measure termination date, and customers are given a 90-day period to apply for an incentive after the date of purchase.

APS proposes to continue conducting education and outreach for pool owners and pool service professionals about the benefits of upgrading to variable speed pool pumps. In addition, APS intends to work with pool owners and pool professionals to encourage customers on advanced rate plans to shift their pool pumping to off-peak hours to save on energy and demand costs. This includes promoting opportunities to shift pool pump use to midday hours during peak solar production to help address duck curve issues.

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<sup>4</sup> Decision No. 76313 (August 24, 2017).

For the smart thermostat measure, APS intends to reduce the incentive per thermostat from \$75 to \$40 per thermostat starting in January 2018. Prices are beginning to decrease for smart thermostats, with many models available for less than \$150. Smart thermostat technologies allow customers to better manage their energy use and peak demand which saves customers money and supports the system needs. In addition, APS plans to kick-off a residential smart thermostat demand response effort in 2018 as part of the DRESLM initiative. This program will offer additional savings opportunities for customers with smart thermostats.

## **2. Residential New Construction Program**

APS proposes to modify the incentive structure of the APS ENERGY STAR new homes program. The HERS rater incentive of \$50 per home will be reduced to \$30 per home for all homes in both the minimum and HERS 60 incentive tiers. HERS raters, who participate in the program, were informed of a possible incentive reduction in a meeting earlier this year. Rater costs for providing APS program information have decreased over time due to automation. This change allows APS to reduce incentive spending without adversely affecting program participation or savings. APS is not proposing any changes to the builder incentive of \$500/home for homes that meet the minimum program requirements. For the higher tier, APS is proposing to decrease the builder incentive for homes that achieve a HERS rating of 60 or lower from \$1200/home to \$1000/home. In order to manage budgets and also provide time for homebuilders to plan for these program changes, APS proposes to implement these changes and make them effective April 1, 2018. APS intends to inform builders, with ample notice, so these proposed program changes will have a minimal impact on their operations.

In addition, APS is proposing the addition of two new pilot measures in the Residential New Construction program: 1) Grid Connected Water Heating and 2) Pre-Wiring for EV Charging.

APS proposes to add a new grid connected electric water heating pilot measure which would offer an incentive of approximately \$200/home for participating homebuilders who install qualifying grid connected electric hot water heaters. This incentive would be an additional prescriptive incentive that would only be available for builders who participate in the APS ENERGY STAR Homes program. Qualifying water heaters may be standard electric resistance or heat pump water heaters, but they must include communications modules and controls that meet APS integration requirements to allow for remote control of water heater temperature settings during load shifting events. These grid connected water heaters offer opportunities for flattening APS system load shape by shifting energy use into midday non-summer hours during high levels of solar production. By working with homebuilders to incorporate them in new communities, we can proactively create better load shapes more cost effectively by including these water heaters at the time of construction. To encourage builder participation, the proposed builder incentive of \$200/home includes the incremental cost of including grid connected technology in the water heaters plus some incentive dollars to cover other ancillary business costs that participating builders will incur. Homebuyers in participating communities would have an opportunity to participate in future APS demand response program offers that involve grid connected water heating technology.

APS also proposes to add a new pilot measure that would offer an incentive of \$100/home for participating homebuilders who make their homes 'EV ready' by including pre-wiring in their garages to support the future installation of EV charging stations. The objective of this new measure is to help facilitate the electrification of transportation. By including EV ready features in a new home during construction – including pre-wiring and electrical panel capacity, it makes

it much easier and less expensive to add an EV charger in the future. Greater use of EVs can save customers vehicle fuel and maintenance costs while also reducing air emissions and promoting a more sustainable form of transportation. This incentive would be an additional prescriptive incentive that would only be available for builders who participate in the APS ENERGY STAR Homes program. In order to qualify for an EV ready incentive, participating homes must meet all of the following criteria:

- Must be participants in the APS ENERGY STAR Homes program, and meet all of the program requirements.
- Must include a dedicated 240 volt, 40 amp plug-in ready circuit with NEMA 14-50 outlet in vehicle parking area.
- Installation must meet the requirements of the National Electric Code.

Therefore, APS proposes the following modified program incentive structure:

- From January 1 to March 31, 2018 participating homes that meet all of the minimum program requirements are eligible to receive a builder incentive of \$500 and a HERS rater incentive of \$50 per home.
- On April 1, 2018 participating homes that meet all of the minimum program requirements are eligible to receive a builder incentive of \$500 and a HERS rater incentive of \$30 per home.
- From January 1 to March 31, 2018, builders who install additional energy efficiency measures at the time of construction to achieve a HERS rating of 60 or less are eligible to receive a builder incentive of \$1200 and a HERS rater incentive of \$50 per home.
- On April 1, 2018 the builder incentive for achieving a HERS rating of 60 or less will be reduced from \$1200 to \$1000 for all participating homes and the HERS rater incentive will be reduced to \$30 per home.
- APS is proposing 2 new pilot measures that will be optional additional incentives to encourage emerging load shifting technology opportunities. Participating homebuilders who meet all of the minimum program requirements will be eligible for the following additional incentives:
  - **Grid Connected Water Heating:** Builders who install qualifying grid connected electric water heaters are eligible for an additional incentive of approximately \$200/home.
  - **EV Pre-Wire:** Builders who meet program requirements for installing pre-wiring to facilitate the installation of future electric vehicle charging stations are eligible for an additional incentive of \$100/home.

### 3. Residential Conservation Behavior Program

The Conservation Behavior program motivates energy savings by providing mailed home energy reports, emails and online information to participating households. The program shows participants a profile of their current home energy use, how it compares to similar homes, and offers customized tips for saving energy and reducing home energy costs.

APS is proposing to modify the Conservation Behavior Program in several ways in 2018 in order to enhance the program reach and cost effectiveness. First, in order to improve cost effectiveness of the Home Energy Reports, we propose to reduce the number of paper reports mailed to participating households from 4 reports to 3 reports for each household per year. The number of recipients for paper reports will also be reduced from 250,000 to approximately

180,000 households, targeted to reach participants with the highest savings opportunities. In 2018, APS will expand the use of digital email Home Energy Reports from approximately 60,000 customers to 250,000 customers who opt-in to receive the reports. These will consist of households who receive paper Home Energy Reports as well as some households who will receive email reports only. These reports will be emailed to participating households with a new digital Home Energy Report available each month – this strategy increases the number of customers who will receive reports as well as the total number of reports delivered per year.

APS also proposes to introduce new High Bill Alerts and Weekly Energy Updates for 250,000 participating households. These bill forecasting tools use predictive algorithms that take into account current and historical data to project energy use for the remainder of the billing period. They also compare the projected cost to the same time of year in the previous year. For customers who want to learn more, they can link to further information about their energy use and ways to save energy. APS will work to monitor program performance, evaluate savings from new weekly energy updates and high bill alerts, and provide results in the DSM Annual Progress Report.

Given these proposed program changes, APS proposes to suspend the Behavioral Demand Response (BDR) measure in 2018, but may propose that BDR be restarted in a future DSM Implementation Plan.

#### **4. Residential HVAC Program**

APS intends to terminate the Residential Diagnostic (RD) measure by December 31, 2017. Despite several years of promotion to customers and HVAC trade allies, the measure suffers from a lack of participation – in 2016 there were only 284 residential diagnostics projects completed which produced only 151 MWhs and 0.1 MW of energy and demand savings. The volume for 2017 is also very low. The activity on the program does not justify the staff time and resources needed to continue this measure, and APS anticipates this measure will not be cost effective in 2018. For these reasons, APS intends to terminate this measure in 2017.

In accordance with Decision No. 76313 APS is planning to reduce incentives for Duct Test and Repair and HVAC Quality Install beginning Oct. 1, 2017. The Duct Test and Repair maximum incentive per system will go from \$400 to \$250 and the HVAC Quality Install incentive goes from \$245 to \$200 per unit. The lower incentives are reflected in this 2018 plan. In addition, APS is proposing to increase the HVAC Quality Install program requirements to qualify for an incentive from the existing 14 SEER minimum efficiency level up to a 16 SEER minimum efficiency level for the 2018 plan. All of the other current quality installation program requirements will remain.

APS is also proposing to add a new giveaway Smart Thermostat measure into the Residential Existing Homes HVAC, Home Performance, and Multi-Family Programs. The Smart Thermostat measure is a residential energy management technology primarily focused on reducing peak demand, but it will also enable customers who are on TOU and demand rates to pre-cool their homes prior to the 3-8pm peak demand period to help shift energy use and reduce their on-peak energy costs.

This measure targets both single family and multifamily residents with an offer for a free smart thermostat that provides multiple features including a mobile app to manage home energy use. In order to receive the free thermostat, customers must agree to be on an advanced rate plan

(residential R2, R3 or TOU-E rates) and participate in the residential APS smart thermostat demand response program (part of the APS DRESLM program) for one year. The thermostats will come preconfigured to automatically respond to APS advanced rate plans, including preset parameters for pre-cooling prior to peak demand periods and temperature drift during peak periods to reduce demand.

APS will purchase a supply of smart thermostats that include energy efficiency savings functionality like geo-fencing, and the ability to control the thermostat remotely through a cell phone app. These thermostats will also be capable of utility communications for use in future demand response events. Thermostats will be provided free for participating customers who meet program requirements. These thermostats can be ‘DIY’ installed by many customers. APS will provide support for customers who wish to install the thermostats themselves (including links to online video installation guides and a manufacturer install hotline). For customers who do not wish to install themselves, APS will offer a reduced installation cost through participating contractors for a targeted price point of approximately \$99 per thermostat.

## **5. Residential Home Performance Program**

APS proposes a program modification to the Home Performance with ENERGY STAR (HPwES) program which requires that a participating customer must complete an online energy audit of their home on aps.com in order to be eligible for an on-site Home Performance audit. This modification will help educate customers while also providing information that can help streamline the on-site audit process. Customers who proceed with the on-site audit will be eligible to receive all current Home Performance program incentives for completing qualifying home improvement projects including insulation, duct repair, and Western Cooling Control devices. For participating contractors, the program modification will reduce time on-site while also providing better leads for customers who want to proceed with energy upgrades of their homes. In this modified program design, contractors will still offer customers a \$99 price for a home energy audit, but APS will no longer need to provide a \$200 contractor incentive to buy down the cost of the audit. This is a more sustainable lower cost program design that delivers the same value for participating customers more cost effectively.

APS also proposes to remove direct install LEDs and low flow showerheads from the program in 2018. These measures do not provide high value savings load shapes and they contribute to increasing duck curve issues during some time periods. Instead, APS proposes to introduce two new measures into the program – giveaway smart thermostats and a pilot direct install water heater timer measure. The giveaway smart thermostat measure is proposed to be included in the Existing Homes HVAC, Home Performance and Multi-Family programs. For a description of this new measure, see the Existing Homes HVAC section.

The proposed direct install water heater timer pilot measure is designed to help shift energy demand to take advantage of negative market pricing by controlling the timing of electric water heating. The proposed pilot measure would offer free direct installed water heater timers for eligible participating customers who receive an on-site Home Performance energy audit. Participating customers must have electric water heating and agree to be on an advanced rate plan (new TOU or demand rate). The program will be delivered through direct install home performance contractors who will directly install and configure the timers for participating customers.

Customers may be offered up to three different options for water heater timer settings based on their hot water needs, family schedules, and savings goals. The timer schedules will be designed to ensure customer hot water needs are met while also shifting energy demand. In general, timers will be set to turn on the water heater in the early morning to pre-heat water prior to the morning usage peak, and then turned off until midday. In the afternoon, they will be timed to turn on to absorb excess solar generation and pre-heat water prior to the late afternoon peak. Timers will be set to turn off water heaters from 3-8pm (for all or the majority of the on-peak time period depending on customer preferences and hot water usage patterns) to reduce on-peak demand.

## **6. Residential Multi-Family Energy Efficiency Program**

APS proposes several modifications to the Multi-Family program in 2018.

First, APS proposes to condense the new construction element of the program from three tiers into a single tier with one modified Builder Option Package (BOP) of program requirements in order to qualify for an incentive. This change is due to the increase in the baseline of energy efficiency in the multi-family new construction market, as well as decreased APS avoided costs that made the lower tier BOPs not cost effective in 2018. Newly constructed multi-family properties that qualify under the new BOP requirements will receive an incentive of \$300 per qualifying dwelling unit. Details of the new modified BOP are included in Appendix C and in work papers provided to Staff.

Second, APS proposes to remove direct install showerheads, aerators and LED lightbulbs from the Multi-Family program in 2018. These measures produce energy savings that do not align well with current APS resource needs for summer on-peak savings, and they are low cost items that provide quick customer paybacks on energy savings without the need for customer funded incentives. APS proposes that these measures are replaced with other direct install items that provide higher value savings as discussed below.

APS proposes to add two new measures to the program in 2018 – giveaway smart thermostats, and a new pilot measure for direct installation of water heater timers on qualifying electric water heaters. The giveaway smart thermostat measure is proposed to be included in the Existing Homes HVAC, Home Performance and Multi-Family programs. For a description of this new measure, see the Existing Homes HVAC section. The water heater timer pilot measure is also proposed to be included in the Home Performance program. For a description of this new measure, see the Home Performance program section. In the Multi-Family program, APS will work closely with participating property management companies to have their staff (or contractors they hire) install smart thermostats and water heater timers in qualifying multi-family property units.

Finally, APS proposes that the currently approved HVAC Quality Install measure should be included in the multi-family program in addition to the Existing Homes HVAC program. This is an approved cost effective measure that has previously been used in some multi-family properties, but breaking it out separately into the Multi-Family program will allow for better targeting, tracking and reporting of this peak demand focused measure.



## **7. Residential Limited Income Weatherization Program**

In accordance with Decision No. 76313, APS has increased funding for the Limited Income Weatherization Program in the 2018 DSM Plan by \$1 million as compared to the 2017 Plan, for a total of almost \$3,500,000 in 2018. This is an important program that provides support for APS residential customers who have the most difficulty affording their energy costs. Given the importance of this segment and the added budget, APS looks forward to expanding the program outreach in 2018, but we are concerned that this funding will be stranded without added resources and some program modifications to address the backlog of homes needing work.

In particular, federal Weatherization Assistance Program rules limit us to weatherizing a home only once. APS requests an exemption to allow designated weatherization contractors to perform an initial weatherization site visit followed by more in-depth weatherization projects for homes that require additional work. This would allow for homes to be provided with some basic weatherization support and energy savings opportunities quickly with an initial site visit. During that site visit, energy auditors could complete some quick energy improvements (such as installing new LEDs) while also performing valuable work to screen the home for more in depth follow up work. This would better utilize weatherization crew resources while also providing some immediate assistance for customers who are waiting for help.

Another barrier to getting more homes weatherized has been the requirement for community action agencies to leverage APS funds with other funds in order to proceed with a job. APS would also like to be able to grant agencies the ability to not be required to leverage funds if no other funds are available.

Therefore APS proposes the following Weatherization Assistance Program rule exemptions in order to better provide funding and support to benefit qualifying limited income customers:

1. APS funds will be leveraged with other funds whenever possible, but can be used for stand-alone jobs if leveraging funds are not available or are limited.
2. Weatherization activities can be extended to more than one project per home to allow additional measures to be implemented within the program calendar year.

APS is not proposing any other modifications to this program at this time.

## ***B. NON-RESIDENTIAL PROGRAMS***

### **Proposed Program Modifications**

APS proposes the following program modifications to non-residential programs in 2018.

#### **1. Focus program efforts on the water energy nexus and managed water pumping**

APS has been exploring the water energy nexus and in the 2018 DSM Plan we will seek to work with water providers to identify mutually beneficial savings opportunities, including:

- **Leak Reduction.** APS will work with water utilities that have systems with high rates of water leakage to identify the energy savings potential from reduced pumping needs when water leaks are repaired. Through the Custom measure, APS can provide incentives to

water providers that could help pay a portion of the cost of leak repair projects based on the calculated energy savings that result from reduced pumping needs.

- **Pumped Storage/Managed Pumping.** APS will work with water utility customers to identify opportunities for shifting energy demand by using gravity storage and managed pumping within water delivery and treatment systems. Participating customers will be required to switch to a TOU rate. In addition to identifying the demand shifting opportunities, this effort will also look for related water savings opportunities. The effort will target water utilities with existing tanks, as well as those that are planning to expand or build new water treatment systems to look for opportunities to use pumping systems and elevated water towers or tanks to manage energy demand by filling tanks during the belly of the duck curve and by releasing that stored water to reduce pumping needs during peak hours. Pumps will be used during midday hours to pump water up to the storage tank (absorbing excess solar generation in the process), and then the system will use gravity to help reduce the need for pumping energy to serve the late afternoon/evening water system peak. Incentives for pumped energy storage may be included as part of the expanded DRESLM program described below.

## **2. Add a new prescriptive pilot measure for electric water heater timers**

Much like the residential Water Heater Timer initiative, this is a small business direct install pilot measure designed to integrate midday solar generation and reduce peak demand. Participating Solutions for Business trade allies will target small businesses that are likely to have residential size water heaters, such as office buildings, retail stores, repair shops, and convenience stores. The program will not target customers that will have difficulty shifting hot water consumption such as restaurants (for cleaning or dishwashing), hospitals/clinics, and car washes. Participating customers will be required to switch to a TOU rate. As with the residential measure, the trade allies will directly install and configure the timers for customers who agree to participate. Timers will be set to ensure hot water needs are met while also reducing peak demand and shifting demand into midday hours when there is an excess of solar generation. Configuration options for the timers will depend on hot water needs, business schedules and each business manager's desire to save energy. All configuration options will minimize hot water heater operation during on peak hours, and must meet all applicable health and safety codes.

## **3. Add a New School Bus EV Pilot Program**

APS proposes to add a new school bus EV pilot program. This pilot would be funded with \$2.25 million that would be designated to help targeted schools who have difficulty affording the cost of new infrastructure. The pilot program would provide a limited number of EV buses and charging infrastructure free of charge to participating school districts. Participating schools will be selected from a lottery of qualifying districts. The pilot will benefit participating schools through reduced infrastructure costs and significant fuel savings from replacing gasoline powered buses.

For each EV bus deployed, schools will save up to \$8,800 per year on fuel and maintenance costs after accounting for increased electricity purchases. The program, which will target replacing buses near the end of their useful lives, will prevent schools from having to purchase a new school bus – an estimated cost of \$135,000. In addition, participating schools will benefit from receiving new, safe reliable student transportation infrastructure. The program promotes sustainability through decreased reliance on diesel fueled transportation and reduced air

emissions. Where possible, APS will work with participating schools to manage the charging of EV buses to take advantage of excess solar generation to further promote the sustainability of student transportation. APS will implement the pilot in coordination with the Solutions for Business Schools program, and will work with key school stakeholders to define the list of qualifying schools for the pilot.

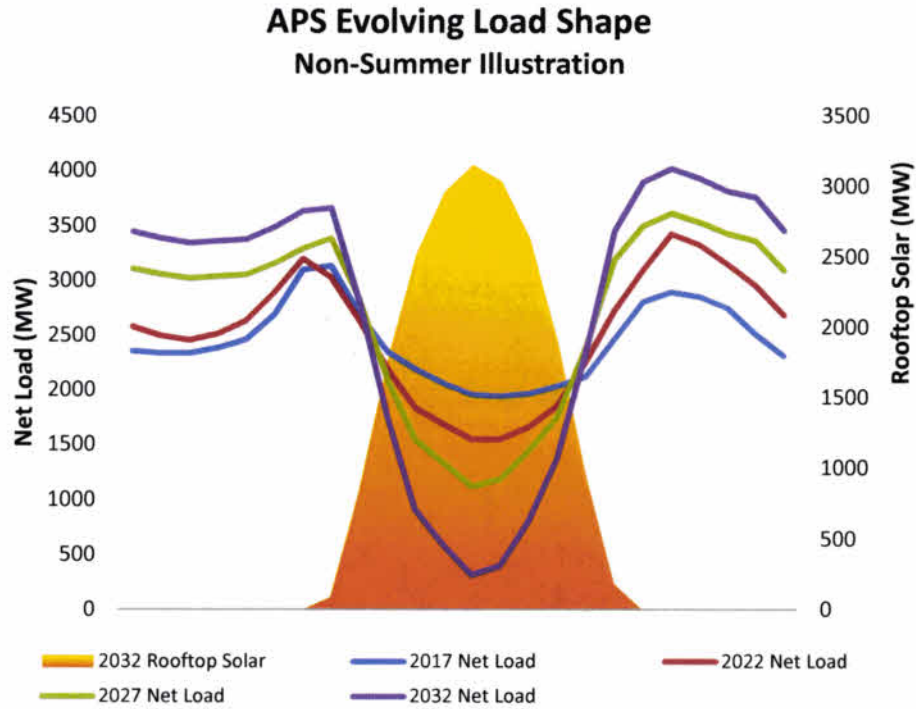
#### **4. Add a New Managed EV Charging Pilot Program**

This program will promote increase adoption of EVs and work with participating customers to manage the load shape of EV charging through scheduling and demand response control. See Attachment 1 for a detailed description of the proposed pilot program.

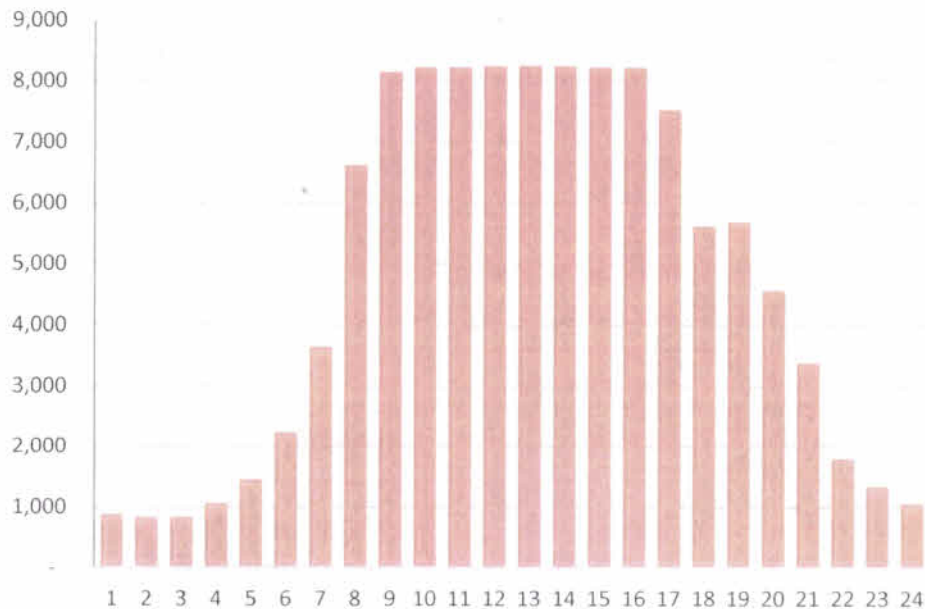
#### **5. Discontinue Lighting Incentives**

APS proposes to terminate lighting incentives for all non-residential programs except the schools program. This is due to the fact that the load profile of the savings from non-residential lighting does not align with APS resource needs. In fact, Figure 4 shows how most non-residential lighting savings typically occur at about the same time as the solar production curve when there is an abundance of low cost solar energy in the region. This savings profile provides limited value as a resource and it can actually exacerbate system load shape issues. In addition, the cost of LED lighting technology has reduced rapidly at the same time that product quality and durability has increased. For most non-residential customers, the combined cost savings in energy and reduced maintenance costs for LED lighting provides an attractive payback of less than 5 years without the need for customer funded incentives. The 2018 budget includes some funding for lighting incentives to cover payment for projects that have submitted pre-applications for lighting incentives prior to the program cut-off date. For the schools program, lighting incentives would still be offered on an ongoing basis for this targeted segment only. The table in Appendix D provides a summary of the non-residential lighting modifications proposed in 2018.

Figure 4 – APS Evolving Load Shape and Non-Res Interior Lighting Savings Profile



### 2017 Forecasted Savings for Interior Commercial Lighting Measures



## 6. Discontinue Refrigeration Incentives

APS proposes to terminate refrigeration incentives for all non-residential programs except the schools program. The load shape of non-residential refrigeration savings does not align well with APS resource needs. These measures produce substantial savings during midday hours in

non-summer months when there is an overabundance of solar generation in the region. In addition, the typical payback on these measures is two years or less without the need for customer funded incentives. The 2018 budget includes some funding for incentives to cover payment for projects that have submitted pre-applications for refrigeration incentives prior to the program cut-off date. For the schools program, refrigeration incentives would still be offered on an ongoing basis for this targeted segment only. The table in Appendix D provides a summary of the non-residential refrigeration modifications proposed in 2018.

**7. Discontinue Incentives for all Motors Measures (except HVAC EC motors)**

APS proposes to terminate incentives for all motors measures (with the exception of HVAC EC motors that serve air conditioning loads) in all non-residential programs. This is due to the fact that the typical load shape of savings from non-residential motors does not align well with APS resource needs. A significant portion of the annual savings from motors occurs during midday non-summer hours when there is an abundance of solar generation in the region. Non-residential motors accounted for less than 1% of total non-residential savings in 2016 (the most recent full year of data available) so the impact of removing motors measures is minimal. The 2018 budget includes some funding for incentives to cover payment for projects that have submitted pre-applications for motors incentives prior to the program cut-off date. The table in Appendix D provides a summary of the non-residential motors modifications proposed in 2018.

**8. Discontinue incentives for CO2 Sensors, CO Sensors and Hotel Room Controls**

APS proposes to terminate incentives for CO2 sensors, CO sensors, and hotel room controls in all non-residential programs because these measures do not align well with APS resource needs. A significant portion of their annual energy savings occurs during the midday solar production curve in non-summer months. These measures represented less than 1% of all non-residential savings in 2016 (the most recent full year of program data), so the impact of removing these measures will be minimal. The 2018 budget includes some funding for incentives to cover payment for projects that have submitted pre-applications for these measures prior to the program cut-off date. The table in Appendix D provides a summary of these proposed modifications in 2018.

**9. Discontinue Incentives for Advanced HVAC Diagnostic; HVAC Testing and Repair; and Efficient Clothes Washers**

APS proposes to terminate incentives for Advanced HVAC Diagnostics, HVAC Testing and Repair, and Efficient Clothes Washers in all non-residential programs. These measures do not pass the Societal Cost Test. These measures represented less than 1% of all non-residential savings in 2016 (the most recent full year of program data), so the impact of removing these measures will be minimal. The 2018 budget includes some funding for incentives to cover payment for projects that have submitted pre-applications for these measures prior to the program cut-off date.

| <b>Measure</b>                  | <b>2017 Incentives</b>  | <b>Proposed 2018 Incentives (Other Non-Residential)</b> |
|---------------------------------|-------------------------|---|
| Advanced Diagnostic Tune Up     | \$240/unit              | \$0/unit  |
| HVAC Test & Repair – Duct Work  | \$225/unit and \$15/ton | \$0/unit and \$0/ton                                    |
| HVAC Test & Repair – economizer | \$225/unit              | \$0/unit  |

|                           |               |          |
|---------------------------|---------------|----------|
| Efficient Clothes Washers | \$50-200/unit | \$0/unit |
|---------------------------|---------------|----------|

**10. Modify the incentive structure for Non-Residential Whole Building and Retro-Commissioning, and Custom measures**

APS proposes to modify the incentive structure of the non-residential whole building, retro-commissioning, and custom measures to focus incentives on achieving on-peak savings. The current incentive structure pays \$0.05 per kWh for first year annual savings on Custom projects; \$0.11 per kWh for first year annual savings on Retro-Commissioning projects; and an average of \$0.13 per kWh for first year annual savings for Whole Building projects. The new proposed structure will promote customer savings during high value summer on peak hours by paying incentives based on targeted energy savings from 3 PM to 8 PM daily from June through September only. The proposed incentive structure is as follows.

|                     | Current                   | Proposed                               |                            |
|---------------------|---------------------------|--|----------------------------|
|                     | Annual first year savings | On Peak (3-8pm daily) (June 1-Sept 30) | Off Peak (all other hours) |
| Custom              | \$0.05/kWh                | \$0.28/kWh                             | \$0.00/kWh                 |
| Retro-Commissioning | \$0.11/kWh                | \$0.28/kWh                             | \$0.00/kWh                 |
| Whole Building      | \$0.13/kWh                | \$0.28/kWh                             | \$0.00/kWh                 |

**C. DEMAND SIDE MANAGEMENT INITIATIVES**

**1. Demand Response**

APS proposes to continue its current demand response and load management programs including the APS Peak Solutions<sup>®</sup> program, Peak Event Pricing, and Time-of-Use Rates.

Pursuant to Decision No. 76314 APS is starting implementation of the residential Demand Response, Energy Storage and Load Management (DRESLM) initiative that will be continued in 2018. In accordance with Decision No. 76313, APS is expanding the DRESLM initiative to include non-residential customers and an increase of \$2 million in funding. The initiative is designed to facilitate demand response, peak demand management and load shifting technologies.

APS is proposing a new reverse demand response pilot initiative in 2018. This pilot will work with qualifying non-residential facilities to identify opportunities for dispatching loads in response to negative pricing events. This pilot directly addresses the resource needs highlighted earlier in this document, and invites customers to work with APS to find innovative ways to benefit themselves as well as contribute to lowering rates for all APS customers. Customers would identify beneficial but non-essential loads that could be operated in response to an event signal. These loads would be sub-metered and provided with no-cost energy during these event periods. This pilot provides load flexibility to help address duck curve challenges and reduce the need to curtail solar during periods of negative pricing, responsiveness that puts a downward pressure on all customer rates. To be eligible, the dispatchable customer load must have a demand of at least 30kW.

As part of the pilot costs, APS would provide the sub-metering and communications infrastructure needed at the facility to enable calling reverse DR events. There would be no ongoing incentive for participation, but customers will receive the benefits of free energy during reverse DR event periods. APS proposes to limit the pilot to no more than \$200,000 in total spending in 2018, and to report on the program results and benefits in the DSM Annual Progress Report.

## **2. 2018 System Savings Projects**

APS proposes the following System Savings Projects in 2018:

- Operation of Conservation Voltage Reduction systems on an estimated 11 distribution feeders throughout the APS service territory in 2018;
- Energy efficiency upgrades to APS facilities that are included in the Solutions for Business program, including measures such as installation of new Energy Management System controls, new higher efficiency HVAC air handlers, package HVAC unit replacements, and installation of variable frequency drives.

APS intends to count towards the EES, an estimated 15,000 MWhs of annual energy savings from APS System Savings projects in 2018.

## **3. Building Codes and Appliance Standards**

The Building 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. In 2018, APS intends to continue current program efforts and tracking codes and standards related savings. APS estimates approximately 26,000 MWhs of savings from the Energy Codes and Appliance Standards initiative in 2018.

## **4. Energy and Demand Management Education**

This program was approved in Decision No. 76313.

Energy usage information tools and resources can provide customers with enhanced feedback to help better manage their energy use and demand. These tools can help educate customers about the ways that they use energy and point out opportunities for savings. The result is a more informed consumer who better understands how to manage their energy use and demand, improve efficiency and save energy costs.

The program will introduce new energy information tools including web based energy and demand analyzers to help customers manage their usage. APS plans to continue ongoing support and enhancements to these customer educational tools for residential and non-residential customers. In 2018, this will include information and education classes about load shifting technologies and electrification opportunities including electric forklifts, shifting timing of pool pumping, energy storage, the water energy nexus, and demand response.

A key objective will be to measure the energy efficiency savings that result from behavioral changes in energy use that occur when customers receive enhanced energy information. This is in accordance with R14-2-2412(F) of the Arizona Energy Efficiency Rules (EE Rules) which

states that, “educational programs shall be analyzed for cost effectiveness based on estimated energy and peak demand savings resulting from increased awareness about energy use and opportunities for saving energy.” The data gathered from the program will be used to inform future planning efforts.

## **5. Transmission & Distribution Pilot**

The T&D pilot was included in the APS 2017 DSM Plan. It will provide information on benefits from improved system operations that may be gained by targeting demand side management opportunities at the substation level. Data will be collected to measure the reliability of the resulting load reduction impacts compared to planning estimates at the substation level to assist in future planning efforts. The results of the DSM pilot will be compared and measured against the anticipated load on the substation and traditional ‘wires alternative’ capital construction projects that would have been needed to serve the predicted capacity. Data on total project cost and performance will be used to compare the costs and benefits of the DSM solution to the traditional wires alternative. APS intends to track and report the pilot project cost and benefits to determine the incremental cost effectiveness value that can be gained with this targeted approach.

## **6. Load Management Technologies Pilot**

The Load Management Technologies Pilot was included in the APS 2017 DSM Plan.

It seeks to deploy commercially available load control and load shifting technologies for residential and non-residential customers. The pilot focuses on understanding the potential benefits of these technologies in meeting APS’ flexible resource needs. APS will field test the value of select utility controlled and/or price responsive load management technologies to gather data on energy and demand savings, reliability of load reductions, and systems operations benefits.

APS will implement the load management pilot program as an extension of current DSM program implementation efforts. Load management technologies for non-residential customers will be promoted and implemented through the Solutions for Business program. Technologies for residential customers may be promoted through each of the current APS residential DSM programs including Residential Existing Homes HVAC, Residential New Construction, Home Performance, Consumer Products, Multi-Family, and/or Limited Income Weatherization programs.

# **V. Budget**

## **A. DSM BUDGET**

Table 1 (below) shows the anticipated 2018 DSM spending by program. The budget in this Plan represents the estimated spending required to meet the estimated 2018 DSM savings of 142 MW and 434,000 MWhs. These projections are based on APS’s best estimates of market penetration and customer demand for each program measure. The table includes the anticipated budget by program, broken down by spending category.



**Table 1  
Estimated 2018 DSM Spending by Program\***

| Program                                       | Rebates and Incentives (\$) | Training & Technical Assistance (\$) | Consumer Education (\$) | Program Implementation (\$) | Program Marketing (\$) | Planning and Administration (\$) | Financing (\$) | Total Program Cost (\$) |
|---|-----------------------------|--------------------------------------|-------------------------|-----------------------------|------------------------|----------------------------------|----------------|-------------------------|
| <b>RESIDENTIAL</b>                            |                             |                                      |                         |                             |                        |                                  |                |                         |
| Consumer Products                             | \$670,000                   | \$30,000                             | \$0                     | \$1,900,000                 | \$250,000              | \$275,000                        | \$0            | \$3,125,000             |
| Existing Homes HVAC                           | \$2,974,000                 | \$243,000                            | \$0                     | \$1,395,288                 | \$190,000              | \$370,000                        | \$0            | \$5,172,288             |
| Home Performance with ENERGY STAR             | \$1,256,998                 | \$0                                  | \$0                     | \$401,000                   | \$70,000               | \$120,000                        | \$0            | \$1,847,998             |
| Residential New Construction                  | \$3,774,000                 | \$30,000                             | \$0                     | \$360,000                   | \$110,000              | \$474,000                        | \$0            | \$4,748,000             |
| Low Income Weatherization                     | \$3,276,786                 | \$15,000                             | \$25,000                | \$50,000                    | \$35,000               | \$78,000                         | \$0            | \$3,479,786             |
| Conservation Behavior                         | \$0                         | \$0                                  | \$0                     | \$1,500,000                 | \$0                    | \$70,000                         | \$0            | \$1,570,000             |
| Multi-Family Energy Efficiency                | \$1,516,633                 | \$15,000                             | \$0                     | \$900,000                   | \$25,000               | \$90,000                         | \$0            | \$2,546,633             |
| <b>Totals for Residential</b>                 | <b>\$13,468,417</b>         | <b>\$333,000</b>                     | <b>\$25,000</b>         | <b>\$6,506,288</b>          | <b>\$680,000</b>       | <b>\$1,477,000</b>               | <b>\$0</b>     | <b>\$22,489,705</b>     |
| <b>NON-RESIDENTIAL</b>                        |                             |                                      |                         |                             |                        |                                  |                |                         |
| Large Existing Facilities                     | \$2,874,370                 | \$200,000                            | \$25,000                | \$3,897,000                 | \$700,000              | \$450,000                        | \$0            | \$8,146,370             |
| New Construction and Major Renovation         | \$415,895                   | \$50,000                             | \$5,000                 | \$370,617                   | \$20,000               | \$70,000                         | \$0            | \$931,512               |
| Small Business                                | \$33,512                    | \$25,000                             | \$5,000                 | \$0                         | \$41,000               | \$25,000                         | \$0            | \$129,512               |
| Energy Information Services                   | \$36,000                    | \$5,000                              | \$0                     | \$21,801                    | \$3,000                | \$2,000                          | \$0            | \$67,801                |
| Schools                                       | \$366,444                   | \$20,000                             | \$5,000                 | \$220,000                   | \$30,000               | \$50,000                         | \$0            | \$691,444               |
| Schools EV Bus Pilot                          | \$2,250,000                 | \$0                                  | \$0                     | \$0                         | \$0                    | \$0                              | \$0            | \$2,250,000             |
| Managed EV Charging Pilot                     | \$1,200,000                 | \$0                                  | \$0                     | \$70,000                    | \$50,000               | \$10,000                         | \$0            | \$1,330,000             |
| <b>Totals for Non-Residential</b>             | <b>\$7,176,221</b>          | <b>\$300,000</b>                     | <b>\$40,000</b>         | <b>\$4,579,418</b>          | <b>\$844,000</b>       | <b>\$607,000</b>                 | <b>\$0</b>     | <b>\$13,546,639</b>     |
| <b>DEMAND SIDE MANAGEMENT INITIATIVES</b>     |                             |                                      |                         |                             |                        |                                  |                |                         |
| Demand Response                               | \$0                         | \$0                                  | \$0                     | \$2,200,000                 | \$0                    | \$0                              | \$0            | \$2,200,000             |
| Energy Storage and Load Management ("DRESLM") | \$3,721,840                 | \$80,000                             | \$140,000               | \$1,488,000                 | \$389,000              | \$181,000                        | \$0            | \$5,999,840             |
| Building Code and Appliance Standards         | \$0                         | \$0                                  | \$0                     | \$100,000                   | \$0                    | \$0                              | \$0            | \$100,000               |
| APS System Savings                            | \$0                         | \$0                                  | \$0                     | \$0                         | \$0                    | \$0                              | \$0            | \$0                     |
| Energy and Demand Management Education        | \$0                         | \$0                                  | \$974,000               | \$326,000                   | \$150,000              | \$50,000                         | \$0            | \$1,500,000             |
| Load Management Technologies Pilot            | \$0                         | \$0                                  | \$0                     | \$0                         | \$0                    | \$0                              | \$0            | \$0                     |
| Transmission and Distribution Pilot           | \$0                         | \$0                                  | \$0                     | \$0                         | \$0                    | \$0                              | \$0            | \$0                     |
| <b>Totals for DSM Initiatives</b>             | <b>\$3,721,840</b>          | <b>\$80,000</b>                      | <b>\$1,114,000</b>      | <b>\$4,114,000</b>          | <b>\$539,000</b>       | <b>\$231,000</b>                 | <b>\$0</b>     | <b>\$9,799,840</b>      |
| <b>Segment Totals</b>                         | <b>\$24,366,478</b>         | <b>\$713,000</b>                     | <b>\$1,179,000</b>      | <b>\$15,199,706</b>         | <b>\$2,063,000</b>     | <b>\$2,315,000</b>               | <b>\$0</b>     | <b>\$45,836,185</b>     |

|                              |                     |
|------------------------------|---------------------|
| Program Costs                | \$45,836,185        |
| Measurement, Eval & Research | \$1,800,000         |
| <b>TOTAL</b>                 | <b>\$47,636,185</b> |

\* Includes a total of \$43,636,185 proposed to be funded in new DSMAC collections and \$4 million from the DSMAC balance account in accordance with Decision No. 76314. In addition, \$5 million was approved in Decision No. 76295 to be funded from the DSMAC balance account to assist with customer education in the transition to new rates. When this is included, the total spend is estimated to be \$52,636,185.

**B. DEMAND SIDE MANAGEMENT ADJUSTMENT CHARGE**

APS is proposing to reduce the current DSMAC charges approved in Decision No. 76313, which are currently set at \$0.000982 per kWh and \$0.353 per kW. The proposed new DSMAC charges would be \$0.000837 per kWh and \$0.301 per kW. Table 2 below shows the 2018 revenue requirements for the DSM Adjustor Charge.

In accordance with Decision No. 75679, APS intends to fund the proposed Demand Response, Energy Storage and Load Management (DRESLM) initiative with up to \$4 million of collected, but unspent funds, from the DSMAC balancing account. In Decision No. 76314 the DRESLM funding was subsequently increased to up to \$6 million in total, of which up to \$4 million will be funded with collected but unspent funds and the remaining budget will come from 2018 DSMAC collections. In addition, Decision No. 76295 orders \$5 million to be spent from the DSM balancing account towards customer education in the transition to new rates.

**Table 2 – 2018 Revenue Requirements for DSMAC**

|  |                       |
|--|-----------------------|
| Total 2018 DSM Budget                        | \$52,636,000          |
| Amount Recovered in Base Rates               | (\$20,000,000)        |
| Collected but Unspent Funds                  | <u>(\$9,000,000)*</u> |
| Subtotal                                     | \$23,636,000          |
| Less Gain on Sale of Assets Balance          | (\$87,000)            |
| <br>Total Revenue Requirement for 2018 DSMAC | <br>\$23,549,000      |

\*Includes funding of up to \$4 million for the DRESLM program and \$5 million approved in Decision No. 76295 to assist with customer education in the transition to new rates.

**C. PERFORMANCE INCENTIVE**

APS is not requesting a performance incentive as part of the 2018 DSM plan.

**VI. DSM Energy Savings and Benefits**

Table 3 provides details of the expected annual and lifetime energy savings and peak demand reductions from each DSM program and initiative, and a summary of the net benefits generated for 2018. These are in addition to energy savings, costs and net benefits associated with APS DSM activities undertaken during the 2005 through 2017 timeframe, which are reported each year in APS’s Semi-Annual DSM Report filings. The lifetime energy savings are the estimated savings that will result over the expected lifetime of all program measures installed in 2018. Note that the current construct for measuring DSM net benefits requires use of the societal cost test. This test was developed for energy efficiency programs and as such it is not currently designed to capture all of the benefits of emerging shifting and electrification measures such as the proposed Managed EV Charging Pilot. APS will work to evaluate the results of these pilots and provide a report of program costs and net benefits in the DSM Annual Progress Report.

**Table 3  
2018 DSM Savings and Benefits**

| Program  | Annual Coincident Demand Savings at Generator (MW) | Annual Savings at Generator (MWh) | Lifetime Energy Savings (MWh) | Societal Cost Test Benefits (\$) | Societal Cost Test Costs (\$) | Lifetime Net Benefits (\$) |
|--|--|-----------------------------------|-------------------------------|----------------------------------|-------------------------------|----------------------------|
| <b>RESIDENTIAL</b>                                   |  |                                   |                               |                                  |                               |                            |
| Consumer Products                                    | 5.8  | 18,016                            | 144,321                       | 4,776,715                        | 4,692,321                     | 84,395                     |
| Existing Homes HVAC                                  | 12.4   | 15,029                            | 171,291                       | 8,120,571                        | 7,877,699                     | 242,872                    |
| Home Performance with ENERGY STAR                    | 7.4  | 12,866                            | 106,796                       | 3,806,969                        | 3,770,450                     | 36,519                     |
| Residential New Construction                         | 5.5  | 10,896                            | 217,947                       | 8,983,132                        | 8,929,412                     | 53,720                     |
| Low Income Weatherization                            | 0.2  | 1,393                             | 25,065                        | 469,310                          | 469,310                       | 0                          |
| Conservation Behavior                                | 39.8   | 78,662                            | 78,662                        | 1,593,963                        | 1,577,843                     | 16,121                     |
| Multi-Family Energy Efficiency                       | 4.0  | 8,375                             | 152,617                       | 4,028,091                        | 3,961,747                     | 66,345                     |
| <b>Totals for Residential</b>                        | <b>75.1</b>  | <b>145,237</b>                    | <b>896,699</b>                | <b>31,778,751</b>                | <b>31,278,780</b>             | <b>499,970</b>             |
| <b>NON-RESIDENTIAL</b>                               |  |                                   |                               |                                  |                               |                            |
| Large Existing Facilities                            | 12.7   | 55,749                            | 839,617                       | 19,307,179                       | 18,979,281                    | 327,898                    |
| New Construction and Major Renovation                | 2.9  | 11,556                            | 174,765                       | 4,073,385                        | 3,772,546                     | 300,839                    |
| Small Business                                       | 0.6  | 2,778                             | 19,970                        | 439,657                          | 437,089                       | 2,568                      |
| Energy Information Services                          | 3.5  | 3,370                             | 16,850                        | 562,878                          | 329,222                       | 233,655                    |
| Schools  | 1.7  | 6,968                             | 102,268                       | 2,392,270                        | 2,372,798                     | 19,471                     |
| Schools EV Bus Pilot                                 | 0.0  | 0                                 | 0                             |                                  |                               |                            |
| Managed EV Charging Pilot                            | 0.0  | 0                                 | 0                             |                                  |                               |                            |
| <b>Totals for Non-Residential</b>                    | <b>21.3</b>  | <b>80,421</b>                     | <b>1,153,470</b>              | <b>26,775,368</b>                | <b>25,890,937</b>             | <b>884,432</b>             |
| <b>DEMAND SIDE MANAGEMENT INITIATIVES</b>            |  |                                   |                               |                                  |                               |                            |
| Demand Response                                      | 25.0   | 109,500                           | 109,500                       |                                  |                               |                            |
| Energy Storage and Load Management ("DRESLM")        | 13.25  | 58,035                            | 58,035                        |                                  |                               |                            |
| Building Code and Appliance Standards                | 6.9  | 25,988                            | 249,983                       |                                  |                               |                            |
| APS System Savings                                   | 0.2  | 15,000                            | 225,000                       |                                  |                               |                            |
| Energy and Demand Management Education               | 0.0  | 0                                 | 0                             |                                  |                               |                            |
| Load Management Technologies Pilot                   | 0.0  | 0                                 | 0                             |                                  |                               |                            |
| Transmission and Distribution Pilot                  | 0.0  | 0                                 | 0                             |                                  |                               |                            |
| <b>Totals for Demand Side Management Initiatives</b> | <b>45.3</b>  | <b>208,523</b>                    | <b>642,518</b>                | <b>0</b>                         | <b>0</b>                      | <b>0</b>                   |
| <b>TOTAL</b>   | <b>141.7</b>                                       | <b>434,181</b>                    | <b>2,692,687</b>              | <b>58,554,119</b>                | <b>57,169,717</b>             | <b>1,384,402</b>           |

# Appendix A

# APPENDIX A

## DSM Savings Load Shapes by Program and Measure

| Program Name                           | Measure Name   | 2018 Participatio | Total Savings in Each Period |                             |                                   |             | Percent of Savings Occurring in Each Period |                             |                                   |               |
|--|--|-------------------|------------------------------|-----------------------------|-----------------------------------|-------------|---|-----------------------------|-----------------------------------|---------------|
|  |  |                   | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-Apr | Remaining Load (Nights, Weekends) | Total Saved | 3-8pm Weekdays All Year                     | 10-2pm Weekdays October-Apr | Remaining Load (Nights, Weekends) | Hours in a Ye |
|  |  |                   | Year                         | Year                        | Weekends                          | Year        | Year  | Year                        | Year                              | Year          |
| Building Codes and Appliance Standards | ASHRAE Commercial Building Code                      | N/A               | 471,222                      | 217,300                     | 1,659,656                         | 2,348,178   | 20%   | 9%                          | 71%                               |               |
| Building Codes and Appliance Standards | Electric Motors EPCACT Standard                      | N/A               | 163,927                      | 76,476                      | 605,148                           | 845,551     | 19%   | 9%                          | 72%                               |               |
| Building Codes and Appliance Standards | General Service Lamps EISA Standard                  | N/A               | 2,451,605                    | 1,955,622                   | 8,319,541                         | 12,726,769  | 19%   | 15%                         | 65%                               |               |
| Building Codes and Appliance Standards | HVAC 13 to 14 SEER                                   | N/A               | 883,323                      | 225,771                     | 2,628,160                         | 3,737,255   | 24%   | 6%                          | 70%                               |               |
| Building Codes and Appliance Standards | IECC Residential Code                                | N/A               | 632,517                      | 91,028                      | 2,049,980                         | 2,773,524   | 23%   | 3%                          | 74%                               |               |
| Building Codes and Appliance Standards | Linear Fluorescent DOE Standard                      | N/A               | 685,178                      | 546,560                     | 2,325,155                         | 3,556,892   | 19%   | 15%                         | 65%                               |               |
| Consumer Products Program              | Giveaway LEDs  | 100,000           | 661,132                      | 239,212                     | 3,533,776                         | 4,434,121   | 15%   | 5%                          | 80%                               |               |
| Consumer Products Program              | Smart Thermostats                                    | 10,000            | 1,701,238                    | 67,720                      | 4,600,020                         | 6,368,978   | 27%   | 1%                          | 72%                               |               |
| Consumer Products Program              | Variable Speed Pool Pumps                            | 750               | 72,939                       | 28,835                      | 1,335,640                         | 1,437,414   | 5%  | 2%                          | 93%                               |               |
| Energy Information Services            | Energy Information Services                          | 150               | 676,294                      | 311,867                     | 2,381,925                         | 3,370,086   | 20%   | 9%                          | 71%                               |               |
| Home Performance with ENERGY STAR      | Online Audits  | 47,000            | 1,606,465                    | 231,192                     | 5,206,535                         | 7,044,191   | 23%   | 3%                          | 74%                               |               |
| Home Performance with ENERGY STAR      | DI LED Per Bulb                                      | 7,000             | 127,122                      | 45,996                      | 679,472                           | 852,590     | 15%   | 5%                          | 80%                               |               |
| Home Performance with ENERGY STAR      | DI Smart Thermostats                                 | 2,200             | 546,252                      | 61,286                      | 793,637                           | 1,401,175   | 39%   | 4%                          | 57%                               |               |
| Home Performance with ENERGY STAR      | Duct Test and Repair                                 | 2,000             | 504,583                      | 20,085                      | 1,364,354                         | 1,889,023   | 27%   | 1%                          | 72%                               |               |
| Home Performance with ENERGY STAR      | Low Flow Showerheads - HPVES                         | 1,400             | 21,601                       | 11,275                      | 72,644                            | 105,520     | 20%   | 11%                         | 69%                               |               |
| Home Performance with ENERGY STAR      | Attic Insulation Only - R11 to R43                   | 1,150             | 350,075                      | 76,823                      | 1,243,612                         | 1,670,510   | 21%   | 5%                          | 74%                               |               |
| Home Performance with ENERGY STAR      | Residential Western Cooling Controls                 | 500               | 86,656                       | 3,449                       | 234,310                           | 324,415     | 27%   | 1%                          | 72%                               |               |
| Home Performance with ENERGY STAR      | DI Manual Residential Water Heater Timers            | 300               | 123,245                      | -29,658                     | 0                                 | 93,588      | 54%   | -13%                        | -33%                              |               |
| Large Existing Facilities (Non-Res)    | Custom   | 5,500,000         | 929,952                      | 675,057                     | 4,252,491                         | 5,857,500   | 16%   | 12%                         | 73%                               |               |
| Large Existing Facilities (Non-Res)    | EMS - Replacing Digital Controls                     | 1,700,000         | 1,152,741                    | 236,139                     | 4,394,550                         | 5,783,430   | 20%   | 4%                          | 76%                               |               |
| Large Existing Facilities (Non-Res)    | Retrocommissioning                                   | 1,100,000         | 235,091                      | 108,410                     | 827,958                           | 1,171,500   | 20%   | 9%                          | 71%                               |               |
| Large Existing Facilities (Non-Res)    | EMS - Replacing Pneumatic Controls or no existing Ef | 450,000           | 377,912                      | 77,415                      | 1,440,699                         | 1,896,026   | 20%   | 4%                          | 76%                               |               |
| Large Existing Facilities (Non-Res)    | Linear LED 4-foot lamp                               | 167,268           | 46,072,478                   | 47,760,970                  | 186,494,452                       | 280,327,900 | 16%   | 17%                         | 67%                               |               |
| Large Existing Facilities (Non-Res)    | AC & HP Units  | 20,000            | 145,628                      | 37,222                      | 433,289                           | 616,139     | 24%   | 6%                          | 70%                               |               |
| Large Existing Facilities (Non-Res)    | Shade screens  | 15,000            | 79,812                       | 20,399                      | 237,465                           | 337,676     | 24%   | 6%                          | 70%                               |               |
| Large Existing Facilities (Non-Res)    | Water-Cooled Chillers                                | 6,000             | 681,281                      | 174,131                     | 2,027,023                         | 2,882,435   | 24%   | 6%                          | 70%                               |               |
| Large Existing Facilities (Non-Res)    | Linear LED 2-foot lamp                               | 5,866             | 939,087                      | 947,263                     | 3,729,428                         | 5,615,778   | 17%   | 17%                         | 66%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Domestic Water Pump                            | 4,500             | 1,187,000                    | 427,268                     | 4,270,831                         | 5,885,098   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | Linear LED 8-foot lamp                               | 3,200             | 1,208,560                    | 1,436,238                   | 5,394,236                         | 8,039,034   | 15%   | 18%                         | 67%                               |               |
| Large Existing Facilities (Non-Res)    | Linear LED 3-foot lamp                               | 2,771             | 772,469                      | 744,115                     | 2,971,675                         | 4,488,259   | 17%   | 17%                         | 66%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Air Compressor                                 | 2,300             | 1,091,474                    | 392,883                     | 3,927,128                         | 5,411,484   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Chiller Compressor                             | 2,300             | 381,282                      | 137,245                     | 1,371,854                         | 1,890,381   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | Delamping Remove 4-foot lamp                         | 1,605             | 28,506                       | 22,739                      | 96,735                            | 147,980     | 19%   | 15%                         | 65%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Chilled Water Pump                             | 1,600             | 765,682                      | 275,612                     | 2,754,928                         | 3,796,223   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Cooling Tower Fan                              | 1,600             | 179,580                      | 64,641                      | 646,128                           | 890,348     | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - Process Motor                                  | 1,500             | 311,164                      | 112,005                     | 1,119,568                         | 1,542,737   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | VFD - HVAC Fan                                       | 1,200             | 595,064                      | 214,197                     | 2,141,043                         | 2,950,305   | 20%   | 7%                          | 73%                               |               |
| Large Existing Facilities (Non-Res)    | LED - Incandescent w/o Reflector                     | 1,184             | 42,908                       | 34,227                      | 145,608                           | 222,743     | 19%   | 15%                         | 65%                               |               |

| Program Name                        | Measure Name                               | 2018 Participation | Total Savings in Each Period |                               |                                   |             | Percent of Savings Occurring in Each Period |                               |                                   |                 |
|-------------------------------------|--|--------------------|------------------------------|-------------------------------|-----------------------------------|-------------|---|-------------------------------|-----------------------------------|-----------------|
|                                     |  |                    | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | Total Saved | 3-8pm Weekdays All Year                     | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | Hours in a Year |
| Large Existing Facilities (Non-Res) | Linear LED                                 | 1,000              | 274,973                      | 284,490                       | 1,111,515                         | 1,670,978   | 16%   | 17%                           | 67%                               |                 |
| Large Existing Facilities (Non-Res) | ECM  | 800                | 145,072                      | 64,949                        | 645,751                           | 855,773     | 17%   | 8%                            | 75%                               |                 |
| Large Existing Facilities (Non-Res) | VFD - Other/Misc                           | 600                | 190,396                      | 68,534                        | 685,047                           | 943,978     | 20%   | 7%                            | 73%                               |                 |
| Large Existing Facilities (Non-Res) | LED - MR-16 Replacement                    | 470                | 13,220                       | 10,545                        | 44,862                            | 68,627      | 19%   | 15%                           | 65%                               |                 |
| Large Existing Facilities (Non-Res) | LED Traffic                                | 300                | 18,344                       | 8,989                         | 101,058                           | 128,391     | 14%   | 7%                            | 79%                               |                 |
| Large Existing Facilities (Non-Res) | Programmable Thermostat                    | 300                | 228,537                      | 0                             | 0                                 | 228,537     | 24%   | 0%                            | 76%                               |                 |
| Large Existing Facilities (Non-Res) | Smart thermostat                           | 300                | 103,401                      | 26,429                        | 307,651                           | 437,480     | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | VFD - Condenser Water Pump                 | 300                | 93,942                       | 33,815                        | 338,005                           | 465,762     | 20%   | 7%                            | 73%                               |                 |
| Large Existing Facilities (Non-Res) | VFD - Refrigeration Compressor             | 200                | 39,825                       | 14,335                        | 143,291                           | 197,452     | 20%   | 7%                            | 73%                               |                 |
| Large Existing Facilities (Non-Res) | Air-Cooled Chillers < 150 Tons             | 150                | 35,099                       | 8,971                         | 104,429                           | 148,498     | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | Anti-Sweat Heater Controls                 | 100                | 16,447                       | 7,363                         | 73,208                            | 97,018      | 17%   | 8%                            | 75%                               |                 |
| Large Existing Facilities (Non-Res) | PC management software                     | 100                | 3,641                        | 0                             | 0                                 | 3,641       | 12%   | 0%                            | 88%                               |                 |
| Large Existing Facilities (Non-Res) | VFD - Pool Pumps                           | 100                | 77,971                       | 28,066                        | 280,539                           | 386,576     | 20%   | 7%                            | 73%                               |                 |
| Large Existing Facilities (Non-Res) | EC Motor                                   | 50                 | 26,026                       | 6,652                         | 77,436                            | 110,115     | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | VFD - Refrigeration Fan                    | 50                 | 19,409                       | 6,987                         | 69,835                            | 96,231      | 20%   | 7%                            | 73%                               |                 |
| Large Existing Facilities (Non-Res) | Delamping Remove 8-foot lamp               | 22                 | 376                          | 300                           | 1,276                             | 1,952       | 19%   | 15%                           | 65%                               |                 |
| Large Existing Facilities (Non-Res) | Quality Installation - Phase 1             | 20                 | 11,665                       | 2,981                         | 34,706                            | 49,352      | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | Quality Installation - Phase 2 - Duct Seal | 20                 | 17,206                       | 4,398                         | 51,193                            | 72,797      | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | Advanced Diag Tune up                      | 10                 | 2,795                        | 714                           | 8,316                             | 11,825      | 24%   | 6%                            | 70%                               |                 |
| Large Existing Facilities (Non-Res) | Heat Pump Domestic Hot water Heater        | 5                  | 6,809                        | 3,048                         | 30,308                            | 40,165      | 17%   | 8%                            | 75%                               |                 |
| Large Existing Facilities (Non-Res) | 1 HP                                       | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 1.5 HP                                     | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 1.5, 2, 3 HP                               | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 10 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 100-200 HP                                 | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 100 HP                                     | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 125 HP                                     | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 15 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 150 HP                                     | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 2 HP                                       | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 20-40 HP                                   | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 20 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 25 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 3 HP                                       | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 30 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 40 HP                                      | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |
| Large Existing Facilities (Non-Res) | 5 HP                                       | 0                  | 0                            | 0                             | 0                                 | 0           | 19%   | 9%                            | 72%                               |                 |

| Program Name                        | Measure Name                            | 2018 Participation | Total Savings in Each Period |                               |                                   |             | Percent of Savings Occurring in Each Period        |   |  |                 |
|-------------------------------------|---|--------------------|------------------------------|-------------------------------|-----------------------------------|-------------|--|---|--|-----------------|
|                                     |   |                    | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | Total Saved | 3-8pm Weekdays All Year 14% of the Hours in a Year | 10-2pm Weekdays October-April 7% of the Hours in a Year | Remaining Load (Nights, Weekends) 79% of the Hours in a Year | Hours in a Year |
| Large Existing Facilities (Non-Res) | 50-60 HP                                | 0                  | 0                            | 0                             | 0                                 | 0           | 19%  | 9%  | 72%  |                 |
| Large Existing Facilities (Non-Res) | 50 HP                                   | 0                  | 0                            | 0                             | 0                                 | 19%         | 9%   | 72%   |  |                 |
| Large Existing Facilities (Non-Res) | 60 HP                                   | 0                  | 0                            | 0                             | 0                                 | 19%         | 9%   | 72%   |  |                 |
| Large Existing Facilities (Non-Res) | 7.5 HP                                  | 0                  | 0                            | 0                             | 0                                 | 19%         | 9%   | 72%   |  |                 |
| Large Existing Facilities (Non-Res) | 75 HP                                   | 0                  | 0                            | 0                             | 0                                 | 19%         | 9%   | 72%   |  |                 |
| Large Existing Facilities (Non-Res) | Anti-Sweat Heater Controls              | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Automatic Door Closer                   | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Beverage Case Controls                  | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Beverage Machine Controls               | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | CO Sensor                               | 0                  | 0                            | 0                             | 0                                 | 11%         | 7%   | 82%   |  |                 |
| Large Existing Facilities (Non-Res) | CO2 Sensor                              | 0                  | 0                            | 0                             | 0                                 | 22%         | 5%   | 73%   |  |                 |
| Large Existing Facilities (Non-Res) | Coin Operated Laundry                   | 0                  | 0                            | 0                             | 0                                 | 20%         | 9%   | 71%   |  |                 |
| Large Existing Facilities (Non-Res) | Continuous RCX                          | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Daylighting Controls                    | 0                  | 0                            | 0                             | 0                                 | 12%         | 20%  | 68%   |  |                 |
| Large Existing Facilities (Non-Res) | Delamping Remove 2-foot lamp            | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | Delamping Remove 3-foot lamp            | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | ECM+Control                             | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Efficient Compressor                    | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Efficient Condenser                     | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | EMS - Replacing Lighting Controls       | 0                  | 0                            | 0                             | 0                                 | 20%         | 9%   | 71%   |  |                 |
| Large Existing Facilities (Non-Res) | Evaporator Fan Motor Controls kWh       | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | Exit Signs                              | 0                  | 0                            | 0                             | 0                                 | 14%         | 7%   | 79%   |  |                 |
| Large Existing Facilities (Non-Res) | Exit Signs Electroluminescent           | 0                  | 0                            | 0                             | 0                                 | 14%         | 7%   | 79%   |  |                 |
| Large Existing Facilities (Non-Res) | Exit Signs LED                          | 0                  | 0                            | 0                             | 0                                 | 14%         | 7%   | 79%   |  |                 |
| Large Existing Facilities (Non-Res) | Floating Head Pressure Controls         | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to LED                              | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to LED Fixture Replacement Exterior | 0                  | 0                            | 0                             | 0                                 | 6%          | 0%   | 94%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to LED Fixture Replacement Interior | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to LED Lamp Replacement Exterior    | 0                  | 0                            | 0                             | 0                                 | 6%          | 0%   | 94%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to LED Lamp Replacement Interior    | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | HID to TSHO Fixture                     | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | High-Efficiency Evap Fan Motors         | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | High-Efficiency Freezers                | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | High-Efficiency Refrigerator            | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |
| Large Existing Facilities (Non-Res) | High Efficiency Battery Charger         | 0                  | 0                            | 0                             | 0                                 | 20%         | 9%   | 71%   |  |                 |
| Large Existing Facilities (Non-Res) | High Performance Window Glazing         | 0                  | 0                            | 0                             | 0                                 | 24%         | 6%   | 70%   |  |                 |
| Large Existing Facilities (Non-Res) | Hotel Room Control                      | 0                  | 0                            | 0                             | 0                                 | 18%         | 10%  | 72%   |  |                 |
| Large Existing Facilities (Non-Res) | Induction Lighting                      | 0                  | 0                            | 0                             | 0                                 | 19%         | 15%  | 65%   |  |                 |
| Large Existing Facilities (Non-Res) | Integrated Vending Machine Controls     | 0                  | 0                            | 0                             | 0                                 | 17%         | 8%   | 75%   |  |                 |

| Program Name                        | Measure Name  | 2018 Participation | Total Savings in Each Period |                               |                                   | Percent of Savings Occurring in Each Period |                               |                                   |
|-------------------------------------|---|--------------------|------------------------------|-------------------------------|-----------------------------------|---|-------------------------------|-----------------------------------|
|                                     |   |                    | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | 3-8pm Weekdays All Year                     | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) |
| Large Existing Facilities (Non-Res) | LED - Incandescent w/ Reflector                     | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED - Incandescent w/ Reflector                     | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED - Incandescent w/o Reflector                    | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED - MR-16 Replacement kWh                         | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED - MR-16 Replacement                             | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED - Pedestrian Signs                              | 0                  | 0                            | 0                             | 0                                 | 14%   | 7%                            | 79%                               |
| Large Existing Facilities (Non-Res) | LED - Refrigration Strip Lighting w/ Motion Sensor  | 0                  | 0                            | 0                             | 0                                 | 14%   | 7%                            | 79%                               |
| Large Existing Facilities (Non-Res) | LED - Refrigration Strip Lighting w/o Motion Sensor | 0                  | 0                            | 0                             | 0                                 | 14%   | 7%                            | 79%                               |
| Large Existing Facilities (Non-Res) | LED Giveaway Per Bulb                               | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED Rep CFL Lamps NO Reflector                      | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED Rep CFL Lamps W/ Reflector                      | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | LED Troffers  | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | Non-Residential Conservation Behavior               | 0                  | 0                            | 0                             | 0                                 | 20%   | 9%                            | 71%                               |
| Large Existing Facilities (Non-Res) | Occupancy Sensors                                   | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | Occupancy Sensors                                   | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | Outdoor Lighting                                    | 0                  | 0                            | 0                             | 0                                 | 6%  | 0%                            | 94%                               |
| Large Existing Facilities (Non-Res) | PTAC & PTHP   | 0                  | 0                            | 0                             | 0                                 | 24%   | 6%                            | 70%                               |
| Large Existing Facilities (Non-Res) | Reach-in Cooler Controls                            | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | Reduced LPD Exterior                                | 0                  | 0                            | 0                             | 0                                 | 6%  | 0%                            | 94%                               |
| Large Existing Facilities (Non-Res) | Refrigerated Case Novelty Case                      | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | Refrigerated Case Novelty Case                      | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | Replacement Air Compressor                          | 0                  | 0                            | 0                             | 0                                 | 21%   | 10%                           | 69%                               |
| Large Existing Facilities (Non-Res) | Snack Machine Controls                              | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | Street Lighting                                     | 0                  | 0                            | 0                             | 0                                 | 6%  | 0%                            | 94%                               |
| Large Existing Facilities (Non-Res) | Strip Curtains on Walk-Ins                          | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | T8 to LED Stairwell no Occ Sensor                   | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | T8 to LED Stairwell w/ Occ Sensor                   | 0                  | 0                            | 0                             | 0                                 | 19%   | 15%                           | 65%                               |
| Large Existing Facilities (Non-Res) | Vending Machine/Reach In Controls kWh               | 0                  | 0                            | 0                             | 0                                 | 17%   | 8%                            | 75%                               |
| Large Existing Facilities (Non-Res) | Water-Cooled Chillers < 150 Tons Ton                | 0                  | 0                            | 0                             | 0                                 | 24%   | 6%                            | 70%                               |
| Large Existing Facilities (Non-Res) | Water-Cooled Chillers >= 300 Tons Ton               | 0                  | 0                            | 0                             | 0                                 | 24%   | 6%                            | 70%                               |
| Large Existing Facilities (Non-Res) | Water-Cooled Chillers >=150 Tons to 300 Tons        | 0                  | 0                            | 0                             | 0                                 | 24%   | 6%                            | 70%                               |
| Large Existing Facilities (Non-Res) | Western Cooling Control                             | 0                  | 0                            | 0                             | 0                                 | 24%   | 6%                            | 70%                               |
| Large Existing Facilities (Non-Res) | Whole Building                                      | 0                  | 0                            | 0                             | 0                                 | 20%   | 9%                            | 71%                               |
| Limited Income Weatherization       | Limited Income Weatherization                       | 576                | 317,569                      | 45,702                        | 1,029,237                         | 23%   | 3%                            | 74%                               |
| Multifamily                         | DI LED  | 24,000             | 209,581                      | 75,831                        | 1,120,218                         | 15%   | 5%                            | 80%                               |
| Multifamily                         | DI Smart Thermostats                                | 2,000              | 496,593                      | 55,715                        | 721,488                           | 39%   | 4%                            | 57%                               |
| Multifamily                         | Faucet Aerators                                     | 1,600              | 10,336                       | 8,490                         | 65,819                            | 12%   | 10%                           | 78%                               |
| Multifamily                         | New AC Unit Quality Installation                    | 1,500              | 319,808                      | 12,730                        | 864,735                           | 27%   | 1%                            | 72%                               |



| Program Name                     | Measure Name  | 2018 Participation | Total Savings in Each Period |                               |                                   |             | Percent of Savings Occurring in Each Period        |   |  |
|----------------------------------|---|--------------------|------------------------------|-------------------------------|-----------------------------------|-------------|--|---|--|
|                                  |   |                    | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | Total Saved | 3-8pm Weekdays All Year 14% of the Hours in a Year | 10-2pm Weekdays October-April 7% of the Hours in a Year | Remaining Load (Nights, Weekends) 79% of the Hours in a Year |
| Multifamily                      | New Construction Builder Package                      | 1,240              | 482,514                      | 117,064                       | 1,708,888                         | 2,308,466   | 21%  | 5%  | 74%  |
| Multifamily                      | DI Manual Residential Water Heater Timers             | 1,000              | 410,818                      | -98,859                       | 0                                 | 311,960     | 54%  | -13%  | -33%   |
| Multifamily                      | BOP Modifications 2                                   | 902                | 381,865                      | 92,646                        | 1,352,425                         | 1,826,935   | 21%  | 5%  | 74%  |
| Multifamily                      | Low Flow Showerheads - MEEP                           | 900                | 44,422                       | 23,188                        | 149,390                           | 217,000     | 20%  | 11%   | 69%  |
| Non-Residential New Construction | Whole Building  | 4,000,000          | 854,878                      | 394,219                       | 3,010,903                         | 4,260,000   | 20%  | 9%  | 71%  |
| Non-Residential New Construction | Custom  | 1,000,000          | 169,082                      | 122,738                       | 773,180                           | 1,065,000   | 16%  | 12%   | 73%  |
| Non-Residential New Construction | AC & HP Units   | 15,000             | 109,221                      | 27,916                        | 324,967                           | 462,104     | 24%  | 6%  | 70%  |
| Non-Residential New Construction | VFD - HVAC Fan  | 1,000              | 495,887                      | 178,498                       | 1,784,203                         | 2,458,587   | 20%  | 7%  | 73%  |
| Non-Residential New Construction | Water-Cooled Chillers                                 | 750                | 85,160                       | 21,766                        | 253,378                           | 360,304     | 24%  | 6%  | 70%  |
| Non-Residential New Construction | Air-Cooled Chillers >= 150 Tons                       | 500                | 87,335                       | 22,322                        | 259,848                           | 369,505     | 24%  | 6%  | 70%  |
| Non-Residential New Construction | Smart thermostat                                      | 500                | 172,335                      | 44,048                        | 512,751                           | 729,134     | 24%  | 6%  | 70%  |
| Non-Residential New Construction | Air-Cooled Chillers < 150 Tons                        | 300                | 70,197                       | 17,942                        | 208,858                           | 296,997     | 24%  | 6%  | 70%  |
| Non-Residential New Construction | VFD - Chilled Water Pump                              | 300                | 143,565                      | 51,677                        | 516,549                           | 711,792     | 20%  | 7%  | 73%  |
| Non-Residential New Construction | VFD - Condenser Water Pump                            | 200                | 62,628                       | 22,543                        | 225,337                           | 310,508     | 20%  | 7%  | 73%  |
| Non-Residential New Construction | VFD - Process Motor                                   | 200                | 41,488                       | 14,934                        | 149,276                           | 205,698     | 20%  | 7%  | 73%  |
| Non-Residential New Construction | VFD - Cooling Tower Fan                               | 150                | 16,836                       | 6,060                         | 60,575                            | 83,470      | 20%  | 7%  | 73%  |
| Non-Residential New Construction | VFD - Other/Misc                                      | 100                | 31,733                       | 11,422                        | 114,175                           | 157,330     | 20%  | 7%  | 73%  |
| Non-Residential New Construction | Quality Installation - Phase 1                        | 20                 | 11,665                       | 2,981                         | 34,706                            | 49,352      | 24%  | 6%  | 70%  |
| Non-Residential New Construction | Quality Installation - Phase 2 - Duct Seal            | 10                 | 8,603                        | 2,199                         | 25,597                            | 36,399      | 24%  | 6%  | 70%  |
| Residential Behavior             | HER   | 320,000            | 15,696,924                   | 2,258,996                     | 50,873,565                        | 68,829,484  | 23%  | 3%  | 74%  |
| Residential HVAC                 | New AC Unit Quality Installation                      | 8,000              | 2,480,892                    | 98,755                        | 6,708,145                         | 9,287,792   | 27%  | 1%  | 72%  |
| Residential HVAC                 | DI Smart Thermostats                                  | 4,000              | 993,186                      | 111,430                       | 1,442,976                         | 2,547,591   | 39%  | 4%  | 57%  |
| Residential HVAC                 | Duct Test and Repair                                  | 2,900              | 731,645                      | 29,124                        | 1,978,313                         | 2,739,083   | 27%  | 1%  | 72%  |
| Residential HVAC                 | Residential Western Cooling Controls                  | 700                | 121,318                      | 4,829                         | 328,034                           | 454,181     | 27%  | 1%  | 72%  |
| Residential New Construction     | ENERGY STAR v3  | 3,640              | 1,527,401                    | 106,080                       | 4,127,487                         | 5,760,968   | 27%  | 2%  | 72%  |
| Residential New Construction     | ENERGY STAR v3 HERS60                                 | 1,560              | 1,296,677                    | 154,405                       | 3,677,543                         | 5,128,624   | 25%  | 3%  | 72%  |
| Residential New Construction     | Grid tied ERWH New Homes                              | 100                | 29,833                       | -40,939                       | 0                                 | -11,106     | 38%  | -52%  | 9%   |
| Schools                          | Custom  | 1,000,000          | 169,082                      | 122,738                       | 773,180                           | 1,065,000   | 16%  | 12%   | 73%  |
| Schools                          | EMS - Replacing Digital Controls                      | 500,000            | 339,042                      | 69,453                        | 1,292,515                         | 1,701,009   | 20%  | 4%  | 76%  |
| Schools                          | Retrocommissioning                                    | 300,000            | 64,116                       | 29,566                        | 225,818                           | 319,500     | 20%  | 9%  | 71%  |
| Schools                          | EMS - Replacing Pneumatic Controls or no existing EMS | 200,000            | 167,961                      | 34,407                        | 640,311                           | 842,678     | 20%  | 4%  | 76%  |
| Schools                          | Lighting Power Density                                | 100,000            | 86,751                       | 69,200                        | 294,389                           | 450,340     | 19%  | 15%   | 65%  |
| Schools                          | AC & HP Units   | 17,000             | 123,784                      | 31,638                        | 368,296                           | 523,718     | 24%  | 6%  | 70%  |
| Schools                          | Delamping Remove 4-foot lamp                          | 2,000              | 35,521                       | 28,335                        | 120,542                           | 184,399     | 19%  | 15%   | 65%  |
| Schools                          | Water-Cooled Chillers                                 | 1,250              | 141,934                      | 36,277                        | 422,296                           | 600,507     | 24%  | 6%  | 70%  |
| Schools                          | Linear LED 4-foot lamp                                | 1,000              | 275,441                      | 285,536                       | 1,114,944                         | 1,675,921   | 16%  | 17%   | 67%  |
| Schools                          | LED - Incandescent w/o Reflector                      | 815                | 22,598                       | 18,027                        | 76,688                            | 117,313     | 19%  | 15%   | 65%  |

| Program Name                    | Measure Name  | 2018 Participation | Total Savings in Each Period |                               |                                   |             | Percent of Savings Occurring in Each Period |                               |                                   |
|---------------------------------|---|--------------------|------------------------------|-------------------------------|-----------------------------------|-------------|---|-------------------------------|-----------------------------------|
|                                 |   |                    | 3-8pm Weekdays All Year      | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) | Total Saved | 3-8pm Weekdays All Year                     | 10-2pm Weekdays October-April | Remaining Load (Nights, Weekends) |
| Schools                         | LED Rep CFL Lamps NO Reflector                        | 500                | 2,129                        | 1,698                         | 7,226                             | 11,053      | 19%   | 15%                           | 65%                               |
| Schools                         | VFD - Chilled Water Pump                              | 200                | 95,710                       | 34,452                        | 344,366                           | 474,528     | 20%   | 7%                            | 73%                               |
| Schools                         | Outdoor Lighting                                      | 150                | 13,006                       | 0                             | 0                                 | 13,006      | 6%  | 0%                            | 94%                               |
| Schools                         | PC mangement software                                 | 100                | 3,641                        | 0                             | 0                                 | 3,641       | 12%   | 0%                            | 88%                               |
| Schools                         | Smart thermostat                                      | 100                | 34,467                       | 8,810                         | 102,550                           | 145,827     | 24%   | 6%                            | 70%                               |
| Schools                         | VFD - Cooling Tower Fan                               | 100                | 11,224                       | 4,040                         | 40,383                            | 55,647      | 20%   | 7%                            | 73%                               |
| Schools                         | LED - Incandescent w/o Reflector                      | 83                 | 3,008                        | 2,399                         | 10,207                            | 15,615      | 19%   | 15%                           | 65%                               |
| Schools                         | Programmable Thermostat                               | 40                 | 30,472                       | 0                             | 0                                 | 30,472      | 24%   | 0%                            | 76%                               |
| Schools                         | Delamping Remove 8-foot lamp                          | 20                 | 342                          | 273                           | 1,160                             | 1,774       | 19%   | 15%                           | 65%                               |
| Schools                         | High-Efficiency Evap Fan Motors                       | 10                 | 3,312                        | 1,483                         | 14,741                            | 19,535      | 17%   | 8%                            | 75%                               |
| Schools                         | Snack Machine Controls                                | 10                 | 581                          | 260                           | 2,588                             | 3,429       | 17%   | 8%                            | 75%                               |
| Small Business                  | Custom  | 1,000,000          | 169,082                      | 122,738                       | 773,180                           | 1,065,000   | 16%   | 12%                           | 73%                               |
| Small Business                  | EMS - Replacing Pneumatic Controls or no existing EMS | 20,000             | 16,796                       | 3,441                         | 64,031                            | 84,268      | 20%   | 4%                            | 76%                               |
| Small Business                  | Commercial Online Audit                               | 700                | 258,813                      | 119,349                       | 911,547                           | 1,289,709   | 20%   | 9%                            | 71%                               |
| Small Business                  | AC & HP Units   | 500                | 3,641                        | 931                           | 10,832                            | 15,403      | 24%   | 6%                            | 70%                               |
| Small Business                  | Smart thermostat                                      | 200                | 68,934                       | 17,619                        | 205,100                           | 291,654     | 24%   | 6%                            | 70%                               |
| Small Business                  | Programmable Thermostat                               | 10                 | 7,618                        | 0                             | 0                                 | 7,618       | 24%   | 0%                            | 76%                               |
| System Savings (APS facilities) | CVR   | 11                 | 2,558,360                    | 853,628                       | 11,548,492                        | 14,960,479  | 17%   | 6%                            | 77%                               |

# Appendix B

# **APPENDIX B**

## **Description of Previously Approved DSM Programs**

### **RESIDENTIAL PROGRAMS**

#### **1. Consumer Products Program**

The primary target market for the Consumer Products program is APS residential customers who are contemplating the purchase of energy-using products for their homes. The program provides customers with education and incentives to purchase products, such as light bulbs, pool pumps and other consumer products that use less energy. APS implements the program through participating retailers within the APS service territory.

The lighting element of the Consumer Products program promotes high-efficiency Environmental Protection Agency (“EPA”)/Department of Energy (“DOE”) ENERGY STAR® approved lighting. APS solicits discount pricing from LED lighting manufacturers and refers customers to participating retailers to purchase qualifying products. Discount pricing is passed on to consumers through a negotiated agreement with lighting manufacturers and retailers. The program also provides sales training for participating retailers and consumer education, including in-store point-of-sale displays.

The pools element of the Consumer Products program promotes ENERGY STAR qualified energy efficient variable-speed pool pumps to residential pool owners. The program provides incentives to consumers, retailers, and installers to help overcome the higher initial cost of these pool products and to promote their increased adoption in the market place.

The smart thermostat element of the program promotes qualifying energy efficient smart thermostats with advanced features such as occupancy sensors, geo-fencing and remote thermostat operation through mobile apps. The program provides incentives for customers who purchase qualifying thermostats and enroll their thermostats in the program.

#### **2. Existing Homes HVAC Program**

The Residential Existing Homes Program Heating, Ventilation, and Air Conditioning (“Residential HVAC”) measures use 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”) Quality Installation Rebate, Duct Test and Repair, and HVAC Diagnostics portions of the program include measures supporting energy efficient residential air conditioning and heating systems through proper installation, maintenance and repair. The program also provides APS customers with referrals to contractors who meet strict program requirements for professional standards, technician training, and customer satisfaction.

#### **3. Home Performance with ENERGY STAR Program**

The Home Performance with ENERGY STAR (“HPwES”) program promotes a whole house approach to energy efficiency by offering incentives for improvements to the building envelope and HVAC systems of existing residential homes within the APS service territory. The current program includes measures to improve the energy efficiency of the home such as air sealing,

insulation, duct sealing, LED bulbs and low flow showerheads. It also educates customers on how their homes use energy and ways to save energy. To perform on-site energy audits, the HPwES program provides APS customers with referrals to specially credentialed contractors who meet strict program requirements for professional standards, technician training, and customer satisfaction.

#### **4. Residential New Construction Program**

The Residential New Construction program promotes high efficiency construction practices for new homes. It offers incentives to participating builders who meet program EE requirements in order to increase the penetration of high efficiency homes. The program emphasizes the “whole building” approach to improving EE and includes field testing of homes to ensure compliance with APS performance standards. 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 new home and the features to consider.

#### **5. Limited Income Weatherization Program**

APS’s Energy Wise Limited Income Weatherization (“LIW”) Program is designed to improve the energy efficiency, safety, and health attributes of homes occupied by customers whose income falls within 200% of the Federal Poverty Guidelines (“FPG”). The weatherization component of this program serves low income customers with various home improvement measures, including cooling system repair and replacement, insulation, sunscreens, water heaters, window repairs and improvements, as well as other general household repairs. Non-profit agencies and municipal entities owning and operating low income multifamily housing are also able to benefit from funds set-aside to weatherize their complexes. In addition, there is a Crisis Bill Assistance component serving customers whose income falls below 150% of the FPG. These programs elements are administered by various community action agencies throughout APS’s service territory.

#### **6. Conservation Behavior Program**

The Residential Conservation Behavior program provides participating residential customers with periodic reports containing information designed to motivate them to adopt energy conservation behaviors. To drive conservation behavior, the program provides direct-mailed reports to participants that show how the energy usage in their homes compares with energy efficient homes and other similar homes. In addition to providing these benchmarks, the reports also highlight energy efficiency measures and actions that participants can take to improve the energy efficiency of their homes. These tips serve as an energy conservation idea list and education tool to encourage behavioral changes. Participants are also encouraged to visit a program web portal for additional information.

#### **7. Multi-Family Energy Efficiency Program**

The Multifamily Energy Efficiency Program (“MEEP”) aims to improve the efficiency of multifamily properties and dormitories by using a comprehensive approach designed to target existing and new construction multifamily buildings.

The MEEP takes a two-track approach to address the challenges of reaching the multifamily market. The first track targets existing multifamily properties and provides retrofit items that include LED light bulbs, showerheads, and faucet aerators. These measures are provided at no cost to the multifamily community, but must be installed by the facility personnel. In addition, this track works through the Non-Residential APS Solutions for Business programs to provide energy assessments to help multifamily property managers identify additional energy saving opportunities and available APS rebates within the multifamily complex but outside of the individual dwelling units (e.g. common area buildings, swimming pools, outdoor lighting, and laundries).

The second track is a new construction/major renovation program that offers per dwelling incentives for projects that build or conduct major renovations to a higher level of energy efficiency. Incentives increase as a higher level of energy efficiency is achieved.

## **NON-RESIDENTIAL PROGRAMS**

### **1. Large Existing Facilities Program**

The primary targets for the Non-Residential Existing Facilities program are customers who have an aggregated monthly peak demand greater than 100 kW. This program provides prescriptive incentives to owners and operators of large Non-Residential facilities for EE improvements in lighting, HVAC, motors, building envelope, and refrigeration measures. Custom incentives are also provided for EE measures not covered by the prescriptive incentives. Incentives are also provided to customers who conduct qualifying energy studies. The largest customers (electric usage > 40,000 MWh per year) may qualify to self-direct the amount they pay toward DSM funds for their own EE projects. All customers may qualify to receive program arranged financing for their EE projects. Customers may participate in the Direct Install (Direct Install can pay up to 90% of project cost) family of measures in the areas of lighting and refrigeration for any facilities with a peak monthly demand of 400 (“kilowatt”) kW and less.

### **2. New Construction Program**

The Non-Residential New Construction program includes three components: 1) design assistance; 2) prescriptive measures; and 3) custom efficiency measures. Design assistance involves efforts to integrate energy-efficiency into a customer’s design process to influence equipment/systems selection and specification as early in the design process as possible. Prescriptive incentives are available for EE improvements in measures such as lighting, HVAC, motors, building envelope, and refrigeration applications. Whole Building Design is a component within the New Construction custom efficiency measures that influences customers, developers, and design professionals to design, build and invest in higher performing buildings through a stepped performance incentive structure with the financial incentives becoming larger as the building performance improves. The APS Whole Building Design incentives are designed to complement the Leadership in Energy and Environmental Design (“LEED”) green building certification system which was developed by the United States Green Building Council.

### **3. Small Business Program**

The primary targets for the Small Business Program are customers that have a maximum peak aggregated demand of 100 kW or less. This program provides prescriptive incentives to small business owners for EE improvements in lighting, HVAC, motors, building envelope, and

refrigeration applications through a simple and straightforward mechanism. In addition, a customer in the Small Business Program may participate in the Direct Install (Direct Install can pay up to 90% of project cost) family of measures in the areas of lighting and refrigeration and may also qualify to receive APS arranged program financing for their EE projects. Small Business customers are also eligible to receive incentives for energy studies and custom efficiency measures.

#### **4. Schools Program**

This program is designed to set aside funding for K-12 school buildings, including public schools, private schools, and charter schools. If schools fully subscribe this program budget or if they reach their incentive cap of \$100,000 per year under this program, they can participate in other Non-Residential programs. EE incentives are the same as the Large Existing Facilities (for existing school facilities) and New Construction (for new school construction and major renovations). In addition, any size school may participate in the Direct Install measure incentives and may also qualify to receive APS arranged program financing for their EE projects.

#### **5. Energy Information Services Program**

The Energy Information Services (“EIS”) program provides 15-minute interval electric usage data to large Non-Residential customers through a web-based energy information tool. This tool provides users with information that can be used to improve or monitor energy usage patterns, reduce energy use, reduce demands during on-peak periods, and to better manage their overall energy operations.

### **ENERGY SAVINGS INITIATIVES**

#### **1. Codes and Standards Initiative**

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.

#### **2. Demand Response Programs**

APS currently implements several demand response programs and rates. These include the Peak Solutions demand control program, Critical Peak Pricing rates, and Time of Use rates.

#### **3. APS System Savings Initiative**

APS System Savings projects include many of the same types of energy savings measures as those that are being installed at customer sited facilities – but implemented at APS facilities. System Savings projects include but are not limited to APS generation, transmission, distribution, and facilities energy efficiency improvements.

#### **4. Energy and Demand Management Education**

This program was approved in Decision No. 76313. It offers energy usage information tools and resources to provide customers enhanced feedback to help better manage their energy use and demand. These tools can educate customers about the ways that they use energy and point out opportunities for savings. The result is a more informed consumer who better understands how to manage their energy use and demand, improve efficiency and save energy costs.

## **5. Load Management Technologies Pilot**

The Load Management Technologies Pilot was included in the APS 2017 DSM Plan. It seeks to deploy commercially available load control and load shifting technologies for residential and non-residential customers. The pilot will focus on understanding the potential benefits of these technologies in meeting APS' flexible resource needs. APS will field test the value of select utility controlled and/or price responsive load management technologies to gather data on energy and demand savings, reliability of load reductions, and systems operations benefits.

## **6. Transmission and Distribution System Pilot**

The T&D pilot was included in the APS 2017 DSM Plan. It seeks to provide information on benefits from improved system operations that can be gained by targeting demand side management opportunities at the substation level. Data will be collected to measure the reliability of the resulting load reduction impacts compared to planning estimates at the substation level to assist in future planning efforts.

## **7. Demand Response, Energy Storage and Load Management Initiative**

The Demand Response, Energy Storage and Load Management ('DRESLM') initiative was approved in Decision No. 76314. The initiative includes emerging technologies for managing system load shapes including battery storage, connected water heaters, and demand response with smart thermostats. APS is starting implementation of the residential Demand Response, Energy Storage and Load Management (DRESLM) initiative in 2017 that will be continued in 2018. In accordance with Decision No. 76313, APS is expanding the DRESLM initiative to include both residential and non-residential customers and an increase of \$2 million in funding.



# Appendix C

# APPENDIX C

## Multi-Family Builder Option Package (BOP) Requirements

| 2018 NEW CONSTRUCTION PACKAGE STRUCTURE PRESCRIPTIVE PATH  |  |                 |              |   |                         |      |
|--|--|-----------------|--------------|---|-------------------------|------|
| All projects must incorporate ALL requirements in this section   |  |                 |              |   |                         |      |
| Minimum HVAC Requirements  | 14 SEER A/C and 80 AFUE furnace or boiler; -or- 14 SEER A/C and 7.7 HSPF heat pump;  |                 |              |   |                         |      |
| Ductwork   | Leakage ≤ 4 CFM to outdoors per 100 sq. ft. and R-6 minimum insulation on ducts in unconditioned spaces.                           |                 |              |   |                         |      |
| Thermostat   | Energy Star Qualified Thermostat   |                 |              |   |                         |      |
| Envelope: Infiltration   | Infiltration (ACH50) 6 in Climate Zone (CZ) 1-2, 5 in CZ 3-4, 4 in CZ 5-7, 3 in CZ 8   |                 |              |   |                         |      |
| Insulation   | Climate Zone   | Ceiling R-Value | Wall R-Value | Floor R-Value   | Windows                 |      |
|  |  |                 |              |   | U-Factor                | SHGC |
|  | 1 and 2  | 38              | 19           | 13  | 0.4                     | 0.25 |
|  | 3  | 38              | 19           | 19  | 0.35                    | 0.25 |
|  | 4  | 38              | 19           | 19  | 0.32                    | 0.4  |
|  | 5  | 49              | 23           | 30  | 0.3                     | Any  |
|  | 6  | 49              | 23           | 30  | 0.3                     | Any  |
|  | 7 and 8  | 49              | 25           | 30  | 0.3                     | Any  |
| Water Heater   | Gas (EF): 40 Gal = 0.61; 50 Gal = 0.57; 80 Gal = 0.53<br>Electric (EF): 40 Gal = 0.93; 50 Gal = 0.92; 80 Gal = 0.89                |                 |              |   |                         |      |
| Lighting   | 75% ENERGY STAR Lamps and Light bulbs  |                 |              |   |                         |      |
| Windows  | ≤ 15% WFA per home   |                 |              |   |                         |      |
| Lighting and Appliances  | Five or more ENERGY STAR qualified appliances, light fixtures, ceiling fans equipped with light fixtures, and/or ventilation fans. |                 |              |   |                         |      |
|  | Hot Climates<br>(2004 IRC Climate Zones 1, 2, 3)   |                 |              | Mixed & Cold Climates (2004 IRC Climate Zones ≥ 4)  |                         |      |
| HVAC Equipment   | Right Sized: 15 SEER A/C; -or- 15 SEER/8.2 HSPF Heat Pump  |                 |              | ENERGY STAR qualified gas furnace (95 AFUE); -or- ENERGY STAR qualified heat pump; -or- ENERGY STAR qualified boiler (85 AFUE);<br>-or- ENERGY STAR qualified oil furnace (85 AFUE) |                         |      |
| Ductwork   | All ducts and air handling equipment must be located in the conditioned space.   |                 |              | All ducts and air handling equipment must be located in the conditioned space.  |                         |      |
| New Construction Builder Package Performance Path  |  |                 |              | HERS Score  | Incentive               |      |
| Participants may install any combination of measures as long as the building's performance score on the Home Energy Rating score is equal to or less than 65 HERS when tested by a certified HERS rater. The building's performance must meet or exceed the program requirements to qualify for an incentive. Periodic field visits will be conducted throughout the construction process to verify the work qualifies for program incentives. |  |                 |              | 65  | \$400 per dwelling unit |      |

# Appendix D

## APPENDIX D

### Non-Residential DSM Measure Modifications

The following tables provide summaries of the proposed non-residential DSM measure modifications.

#### Proposed Lighting Measure Modifications

| <b>Measure</b>                              | <b>2017 Incentives</b> | <b>Proposed 2018 Incentives (Schools Program)</b> | <b>Proposed 2018 Incentives (Other Non-Residential)</b> |
|---|------------------------|---|---|
| Delamping 2, 3 ft. T8                       | \$2.50/lamp            | \$2.50/lamp                                       | \$0/lamp  |
| Delamping 4, 8 ft T8                        | \$5.00/lamp            | \$2.50/lamp                                       | \$0/lamp  |
| Induction lighting                          | \$55 to \$115/fixture  | \$0/lamp  | \$0/fixture   |
| Occupancy sensors                           | \$0.12/connected Watt  | \$0/connected Watt                                | \$0/connected Watt                                      |
| Daylighting controls                        | \$0.30/connected Watt  | \$0/connected Watt                                | \$0/connected Watt                                      |
| LED exit signs                              | \$25.00/lamp           | \$25.00/lamp                                      | \$0/lamp  |
| Linear LEDs 2-4 ft.                         | \$3.50/lamp            | \$3.00/lamp                                       | \$0/lamp  |
| Linear LEDs 8ft.                            | \$5.50/lamp            | \$3.00/lamp                                       | \$0/lamp  |
| LED non-reflector bulb                      | \$6.50/lamp            | \$6.00/lamp                                       | \$0/lamp  |
| LED reflector bulb                          | \$8.00/lamp            | \$6.00/lamp                                       | \$0/lamp  |
| LED MR-16                                   | \$6.50/lamp            | \$6.00/lamp                                       | \$0/lamp  |
| Refrigerated case LED with motion sensor    | \$30/lamp              | \$30/lamp   | \$0/lamp  |
| Refrigerated case LED without motion sensor | \$25.00/lamp           | \$25/lamp   | \$0/lamp  |
| LED traffic light                           | \$25.00/lamp           | N/A   | \$0/lamp  |
| Lighting Power Density                      | \$0.35/Watt/Reduced    | \$0.35/Watt/Reduced                               | \$0/Watt/Reduced  |
| Outdoor Lights                              | \$90.00/lamp           | \$13 -\$39/lamp                                   | \$0/lamp  |
| Street Lights                               | \$120.00/lamp          | N/A   | \$0/lamp  |

## Proposed Refrigeration Measure Modifications

| <b>Measure</b>                 | <b>2017 Incentives</b> | <b>Proposed 2018 Incentives (Schools Program)</b> | <b>Proposed 2018 Incentives (Other Non-Residential)</b> |
|--------------------------------|------------------------|---|---|
| Energy efficient refrigerator  | \$75/unit              | \$75/unit   | \$0/unit  |
| Energy efficient freezer       | \$75/unit              | \$75/unit   | \$0/unit  |
| Strip curtain                  | \$5/linear foot        | \$5/linear foot                                   | \$0/linear foot   |
| Reach-in cooler control        | \$100/unit             | \$100/unit  | \$0/unit  |
| Anti-sweat heater control      | \$12/linear foot       | \$12/linear foot                                  | \$0/linear foot   |
| Beverage machine controller    | \$100/unit             | \$100/unit  | \$0/unit  |
| Snack machine controller       | \$50/unit              | \$50/unit   | \$0/unit  |
| Automatic door closer          | \$40/door              | \$40/door   | \$0/door  |
| Floating head pressure control | \$20/ton               | \$20/ton  | \$0/ton   |
| Evaporator EC fan motor        | \$100/motor            | \$100/motor                                       | \$0/motor   |
| Efficient condenser            | \$20/ton               | \$20/ton  | \$0/ton   |
| Efficient compressor           | \$60/ton               | \$60/ton  | \$0/ton   |

## Proposed Motors Measure Modifications

| Measure            | 2017 Incentives |           | Proposed 2018 Incentives<br>(All Non-Residential) |        |
|--------------------|-----------------|-----------|---|--------|
|                    | Open            | Closed    | Open  | Closed |
| Horsepower (hp)    |                 |           |   |        |
| 1 hp               | \$2.25/hp       | \$5.00/hp | \$0/hp  | \$0/hp |
| 1.5 hp, 2 hp, 3 hp | \$1.75/hp       | \$5.00/hp | \$0/hp  | \$0/hp |
| 5 hp               | \$1.50/hp       | \$5.00/hp | \$0/hp  | \$0/hp |
| 7.5 hp             | \$1.00/hp       | \$5.00/hp | \$0/hp  | \$0/hp |
| 10 hp              | \$1.00/hp       | \$4.00/hp | \$0/hp  | \$0/hp |
| 15 hp              | \$0.85/hp       | \$3.00/hp | \$0/hp  | \$0/hp |
| 20-40 hp           | \$0.85/hp       | \$2.50/hp | \$0/hp  | \$0/hp |
| 50 hp              | \$0.85/hp       | \$2.25/hp | \$0/hp  | \$0/hp |
| 50-60 hp           | \$0.85/hp       | \$2.00/hp | \$0/hp  | \$0/hp |
| 75 hp              | \$0.85/hp       | \$1.75/hp | \$0/hp  | \$0/hp |
| 100-200 hp         | \$0.85/hp       | \$1.50/hp | \$0/hp  | \$0/hp |
| >200 hp            | Custom          | Custom    | \$0/hp  | \$0/hp |

# Attachment 1

Attachment 1  
Managed EV Charging Pilot Program

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## **Managed Electric Vehicle Charging Pilot Program**

### **Program Concept and Description**

Electric Vehicles (EVs) have experienced robust annual market growth since first becoming widely available in the United States in 2011. EV market growth is expected to accelerate as innovations in EV technology continue to bring longer vehicle range at reduced prices to consumers. EVs offer many benefits; consumers who adopt EVs experience significant savings in reduced annual fuel and maintenance costs as compared to traditional internal combustion powered vehicles; electric vehicles produce zero tailpipe emissions and instead draw their power from an increasingly clean APS resource portfolio; additionally, when charging during off-peak periods, EVs put downward pressure on electricity rates by improving overall load factor (i.e. better utilizing existing grid infrastructure investments). Conversely if EV charging is not properly managed, it can significantly increase peak demand and create transmission and distribution system challenges.

The Managed Electric Vehicle Charging Pilot Program aims to bring the benefits of EVs to participating customers in the most efficient manner for the electric system to maximize benefits for all APS customers. The program will consist of APS owned, operated, and managed EV charging infrastructure designed for three different non-residential applications: 1) charging of commercial fleet vehicles, 2) workplace charging stations to charge employee vehicles, 3) and charging stations installed at multi-family properties (these stations would serve residential multi-family dwellers but would be implemented in partnership with multi-family property management companies). APS will exercise dynamic scheduling of fleet EV charging to preclude charging during peak periods and ensure charging occurs during the most optimal times, as well as initiate demand response events at workplace and multi-family charging stations when needed. Charging times will be scheduled and managed to best avoid customer, distribution and system level peaks.

### **Target Market**

The Managed Electric Vehicle Charging Pilot Program will target three distinct EV Charging market opportunities.

- 1) **Fleet Charging.** The target for the fleet charging element of the program includes all APS commercial and industrial customers with vehicle fleets that have a duty-cycle which permits APS managed off-peak charging. A key market will be municipalities, whose jurisdiction and daily miles traveled are easily met with EVs on the market today.
- 2) **Workplace Charging.** The target market for the workplace charging element of the program will be businesses who are interested in providing workplace charging stations for their employees. The program aims to shift EV charging to

## Attachment 1 Managed EV Charging Pilot Program

take place during daytime solar production periods, as well as to bring the benefits of EVs to APS customers who would otherwise be unable to adopt electric vehicles due to range anxiety associated with EVs limited range and longer daily commutes. By deploying workplace chargers, a portion of residential EV charging will shift from the evening to the hours between 8AM and 3PM, when workplace charging naturally occurs and when EV charging can take advantage of excess regional solar energy production. In addition, deployment of workplace chargers will likely result in increased EV adoption, as indicated by results from the Department of Energy Workplace Charging Challenge, which found that employees with workplace charging are 6 times more likely to drive an EV than the average worker<sup>1</sup>. APS will also exercise demand response of the workplace charging stations in the form of partial or full curtailment of charging when needed to avoid any adverse distribution or system level impacts that may result from EV charging.

- 3) **Multi-Family Charging.** The Multi-Family charging element of the program seeks to bring the benefits of EVs to residential customers who would otherwise be unable to adopt EVs due to a lack of charging infrastructure at their residence. The program will consist of APS owned and operated EV charging infrastructure for use by APS commercial multifamily property owner customer's tenants. The program will enable commercial multifamily customers to more cost-effectively install EV charging stations for their tenants, accelerating the adoption of EVs in multifamily residences. It will also enable these chargers to be integrated onto the grid most efficiently. As a part of the program APS will exercise demand response of the multifamily charging stations in the form of partial or full curtailment of charging when needed to avoid any adverse distribution or system level impacts that may result from the EV charging.

### Current Baseline Conditions

APS provides many tools and resources for customers to help them save energy; however, there are limited tools available to non-residential customers looking to electrify their fleet or offer on-site charging opportunities. Higher upfront costs make it difficult for commercial customers with limited annual budgets to invest in the infrastructure necessary to begin electrifying their fleets or provide charging stations for employees or tenants. As a result, there has been limited adoption of EVs in the commercial and industrial market in Arizona. The proposed pilot program would provide an opportunity for non-residential customers to more cost effectively invest in vehicle charging infrastructure, while also ensuring the most efficient integration of significant loads onto the grid to maximize customer benefits.

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<sup>1</sup> "U.S. Department of Energy Workplace Charging Challenge Progress Update 2016: A New Sustainable Commute". Pg. 5, [https://energy.gov/sites/prod/files/2017/01/f34/WPCC\\_2016%20Annual%20Progress%20Report.pdf](https://energy.gov/sites/prod/files/2017/01/f34/WPCC_2016%20Annual%20Progress%20Report.pdf)

# Attachment 1

## Managed EV Charging Pilot Program

### **Program Eligibility**

For the fleet charging program element, qualified program participants will be commercial or industrial APS customers who as part of the program will either convert existing internal combustion vehicles or procure new electric vehicles dedicated to the APS owned and operated EV charging infrastructure. In addition, program participant's vehicles will need to have a duty-cycle that enables APS to dynamically schedule charging to avoid customer, distribution and system level peaks.

For the workplace charging program element, qualified program participants will be commercial or industrial APS customers with a minimum of 15 full time equivalent employees at the location where the charging stations would be installed. Program participants will need to conduct an employee survey illustrating demand for workplace charging stations. Participants will also be required to work with APS to implement a peak management plan, which will at a minimum incentivize workplace charging to not occur from 3PM to 8PM Monday – Friday.

For the multi-family program element, qualified program participants will be commercial owners of multifamily dwellings with a minimum of 5 occupied units at an individual location. The participants will be required to site the charging infrastructure at a central location accessible by all tenants. Program participants will need to conduct a tenant survey illustrating demand for multifamily charging stations. Participants will also be required to work with APS to implement a peak management plan, which will at a minimum incentivize multifamily charging to not occur from 3PM to 8PM Monday – Friday.

### **Program Rationale and Objectives**

The proposed pilot fits well within a comprehensive DSM portfolio that is designed to address current APS system resource needs in a changing regional energy market. Increased demand during times when prices are negative actually saves customers money by putting downward pressure on rates, while simultaneously helping to integrate excess regional renewable generation and take advantage of negative priced energy. Figure 1 illustrates the amount of negatively priced hours in APS load area from October 2016 through July 2017.

# Attachment 1 Managed EV Charging Pilot Program

**Figure 1 – Percent of Negatively Priced Hours in APS Load Area**

Percent of Negatively Priced Hours for ELAP\_AZPS

| Year | Month | Hour |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |
|------|-------|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
|      |       | 1    | 2  | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19 | 20 | 21 | 22 | 23 | 24 |
| 2016 | 10    |      |    |     | 3%  | 3%  |     |     |     | 3%  | 13% | 16% | 19% | 13% | 10% | 10% | 6%  |     |     |    |    |    |    |    |    |
|      | 11    |      |    | 3%  |     |     | 3%  | 3%  | 7%  | 13% | 20% | 20% | 20% | 33% | 20% | 10% | 3%  |     |     |    |    |    |    |    | 3% |
|      | 12    |      |    |     |     | 6%  | 6%  |     |     |     | 3%  | 10% | 29% | 26% | 26% | 10% | 3%  |     |     |    |    |    |    |    |    |
| 2017 | 1     | 3%   | 6% | 6%  | 10% | 10% | 10% |     |     | 6%  | 19% | 13% | 16% | 26% | 23% | 13% | 13% | 6%  |     |    |    |    |    |    |    |
|      | 2     |      | 7% | 7%  | 18% | 25% | 11% | 4%  |     | 18% | 27% | 36% | 43% | 29% | 29% | 29% | 29% | 25% |     |    |    |    |    |    | 4% |
|      | 3     |      | 3% | 6%  | 13% | 20% | 13% | 3%  | 10% | 23% | 19% | 22% | 22% | 22% | 22% | 17% | 17% | 32% | 10% |    |    |    | 3% |    | 6% |
|      | 4     | 7%   |    | 10% | 10% | 17% | 13% | 7%  | 13% | 30% | 23% | 30% | 27% | 17% | 33% | 37% | 33% | 27% | 13% | 3% |    |    | 3% |    | 3% |
|      | 5     | 3%   | 3% | 3%  | 3%  |     |     | 6%  | 23% | 26% | 16% | 19% | 16% | 19% | 19% | 19% | 10% |     |     |    |    |    |    |    |    |
|      | 6     |      |    |     | 7%  |     |     | 17% | 23% | 30% | 27% | 17% | 13% | 13% | 10% | 10% | 7%  |     |     |    |    |    |    |    | 3% |
|      | 7     | 3%   | 3% | 3%  |     |     | 3%  | 3%  | 3%  | 6%  | 3%  |     |     |     |     |     |     |     |     |    |    |    |    |    |    |

This figure shows how time periods with a combination of high solar production and lower system load, specifically during hours 10-15 (10am-3pm), are resulting in persistently negative regional energy prices, making it clear that promoting EV charging during these times instead of the late afternoon/early evening peak is beneficial for all customers. In addition, there are also a number of hours outside the solar production window that have some negative pricing – specifically in the late night/early morning. Because APS is now involved in a regional real-time energy market, the Energy Imbalance Market, market prices are dictated not just by APS system conditions, but by other participants as well. Excess renewable energy from regional wind generation can be the cause of these negatively priced hours outside solar production timeframes. This provides further opportunities for electrification to allow APS customers to further take advantage of these pricing scenarios.

However, if left unmanaged, EVs can present significant challenges to electric utilities. EV charging can cause distribution system impacts and need for upgraded T&D facilities to meet increased demand, resulting in upward pressure on rates. And because EVs are mobile, it can be difficult to plan for where increase demand needs may occur. At the same time, the high upfront cost of EV charging infrastructure and associated electric service upgrades can present a barrier to the electrification of fleets and adoption of EVs for APS customers.

The Managed EV Charging Pilot program seeks to resolve these issues working collaboratively with APS customers. The program’s objectives include dynamically managing fleet EV charging to occur only during off-peak periods, managing multifamily and workplace charging stations through demand response and participant peak management plans, and accelerating the adoption of EVs to bring forward their associated customer benefits. Electric system benefits will be realized by dynamically managing EV charging based on seasonal and evolving distribution and system level needs, as described above, including conducting demand response events as needed. In addition, the program design enables budget constrained customers to more easily afford EV charging infrastructure, thus empowering customers previously unable to invest in

|   |
|---|
| <p>Attachment 1<br/>Managed EV Charging Pilot Program</p> |
|---|

charging infrastructure with the means to do so. This will result in significant customer benefits including gasoline savings, lower transportation costs, and reduced tailpipe emissions.

### **Program Implementation**

APS will implement the Managed Electric Vehicle Charging Pilot Program as an extension of current non-residential Solutions for Business DSM program implementation efforts. APS will oversee the deployment of charging infrastructure and will work closely with participating customers to establish managed charging schedules.

### **Incentive Design**

The program will fund 100% of the upfront cost to provide EV charging station infrastructure to customers which APS will own, operate and maintain. On average, it is estimated that the full cost will be about \$12,000 per station – including the EV charger and related facility upgrades needed to the electric service.

Over time, the majority of the initial upfront cost will be repaid by participating customers minus a customer incentive that will be subtracted from the full reimbursement cost. This will be done through a reoccurring monthly payment that will be added to the customers APS bill in the form of a rate rider (EVC-GS). The payment will collect all project specific costs from the customer, minus an incentive of \$750 which is equal to 50% of the electrification benefit to other ratepayers. The electrification benefit is calculated based on the avoided costs (in this case avoided costs are negative) associated with the new load and the additional revenue associated with the EVs use of the charging stations.

As participating customers repay the initial installation cost minus the program incentive, these funds will be credited back to the DSMAC balancing account. APS will track the payments back to the DSMAC and will include these credits as part of the annual DSMAC true- up process.

### **Delivery Strategy and Administration**

APS plans to deliver and administer the Managed Electric Vehicle Charging Pilot Program in-house with assistance from Implementation and Evaluation contractor partners.

- APS will work with existing non-residential DSM implementation contractors and through existing communications channels to promote and implement the pilot program outreach.
- APS will engage third parties in the engineering, procurement and construction of the charging infrastructure
- APS will engage with third parties in wirelessly managing the electric vehicle changing stations based on APS requirements
- APS will work with a third party evaluation contractor to assist in collecting and analyzing data for the pilot.

**Attachment 1**  
**Managed EV Charging Pilot Program**

**How to Leverage with Existing Programs**

The pilot program will be integrated with current DSM program efforts and implemented with assistance from current program implementation contractors, so it will leverage the existing program delivery and evaluation infrastructure.

**Marketing and Communications**

The Managed Electric Vehicle Charging Pilot Program marketing and communications efforts will be integrated with other DSM programs, messages and communications channels. APS will work closely with its Key Account Managers to inform APS customers and provide education materials to potential program participants.

**Program Implementation Schedule**

APS will begin implementation of the pilot after ACC approval. APS plans to implement the pilot using existing program implementation contractors and delivery channels. This will ensure that pilot offerings are integrated with other potential DSM opportunities for customers and that the pilot can leverage other program infrastructure and delivery channels. Due to this integrated approach, it is estimated that pilot program offerings could be available to customers starting within 90 days after ACC approval.

**Program Budget**

The 2018 proposed budget is detailed below.

**Table 1 – 2018 Managed Electric Vehicle Charging Pilot Program**

|  | <b>2018</b>        |
|--|--------------------|
| Charging Stations and Supporting Electrical Upgrades | \$1,200,000        |
| Training and Technical Assistance                    | \$0                |
| Consumer Education                                   | \$0                |
| Program Implementation                               | \$70,000           |
| Program Marketing                                    | \$50,000           |
| Planning and Administration                          | \$10,000           |
| <b>Total</b>   | <b>\$1,330,000</b> |

Of the total budget above, \$1,255,000 will be collected from participating customers through payments collected via the rate rider. \$75,000 in incentives will be provided to customers at \$750 per charging station.

**Estimated Energy Savings**

The Managed Electric Vehicle Charging Pilot Program is expected to manage approximately 335 MWh of total annual energy use when all of the 100 estimated

**Attachment 1**  
**Managed EV Charging Pilot Program**

charging stations in the pilot are deployed. By operating the charging stations, APS can schedule and manage this load to help flatten the overall system load shape and create additional benefits for all customers. The program is also expected to result in an annual 40,000 gallons of avoided gasoline consumption and corresponding air emissions. These savings estimates will be refined based on the data collected from the pilot.

**Cost Effectiveness**

The Managed EV Charging Pilot Program provides significant customer benefits – including individual participant benefits such as fuel savings and non-participant benefits for all customers due to the strategic load that EV charging can provide to help flatten the overall APS system load shape. Traditional EE cost effectiveness tests are limited in how to measure all of the benefits of EVs, and need to be adapted to provide an accurate metric for Arizona. A key objective of the pilot will be to gather data to inform the cost effectiveness analysis and APS intends to report on the benefits, costs, load management impacts, and cost effectiveness results of the pilot in the DSM Annual Progress Report.

# Attachment 2





**EXPERIMENTAL RIDER SCHEDULE EVC-GS  
ELECTRIC VEHICLE CHARGER – GENERAL SERVICE**

AVAILABILITY

This rate schedule is available to all Customers served on Rate Schedules E-32 XSD, E-32 TOU XS, E-32 M, E-32L, E-32 TOU M, E-32 TOU L, E-34, and E-35.

DESCRIPTION

EVC-GS is a rider designed to charge customers for the Electric Vehicle Charger owned and operated by APS under the Managed Electric Vehicle Charging Pilot Program. The program will consist of APS owned, operated, and managed EV charging infrastructure designed for three different non-residential applications: 1) charging of commercial fleet vehicles, 2) workplace charging stations to charge employee vehicles, 3) and charging stations installed at multi-family properties (these stations would serve residential multi-family dwellers but would be implemented in partnership with multi-family property management companies). Customers must be enrolled in the Managed Electric Vehicle Charging Pilot Program to take service under this rate schedule.

CHARGES

The following formula is for charges related to the Electric Vehicle Charger and is in addition to the charges in the Customer’s parent rate schedule. Each amount will be customer specific and be detailed in the electric service agreement.

|                              |  |
|------------------------------|--|
| Cost per Charging Station:   | The cost of the electric vehicle charger as agreed to between APS and Customer.                          |
| Incentive per Station:       | \$ incentive based on the Managed Electric Vehicle Charging Pilot Program choice                         |
| Number of Charging Stations: | Total number of stations APS will install.   |
| Months:                      | The total number of months for the initial contract period.  |
| Monthly Maintenance Fee:     | Monthly fee to maintain and operate the electric vehicle chargers as agreed to between APS and Customer. |

$$\frac{((\text{Cost per Charging Station} - \text{Incentive per Station}) \times \text{Number of Charging Stations}) + \text{Project Specific Upgrades}}{\text{Months}} = \text{Monthly Charger Fee}$$

$$\text{Monthly Charger Fee} + \text{Monthly Maintenance Fee} = \text{Monthly Charge}$$

SERVICE DETAILS

1. Customers taking service under this rider rate are required to execute an electric service agreement.
2. When the original term of the contract expires, billing will continue on a month to month basis until the customer executes a new agreement or terminates service.
3. This rate rider requires the Customer’s usage to be measured with an AMI meter.
4. A Customer cannot be on this rate rider and another demand response program offered by the Company.
5. A Customer may not combine this rider with the School Discount rider SD-1, aggregation discount in E-32 L and E-32 TOU L, or AG-X.
6. Customer must exercise all reasonable care to prevent loss or damage to Company property installed on the Customer’s site for the purpose of supplying this service to the customer.
7. Customer is responsible for payment for loss or damage to Company property on the Customer’s site arising from neglect, carelessness, or misuse and must reimburse the Company for the cost of necessary repairs or replacements.
8. The initial contract term will be 10 years and this rate schedule will apply to the contract for that time unless cancelled or modified by the ACC prior to the end of the initial contract term.



**EXPERIMENTAL RIDER SCHEDULE EVC-GS  
ELECTRIC VEHICLE CHARGER – GENERAL SERVICE**

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9. Customers may terminate participation in this rate schedule at any time.
10. When a customer terminates service under EVS-GS they will be responsible for paying the APS removal fee and a contract buyout fee. The removal fee will cover the cost of APS removing the charger from the customer premise.
11. The buyout fee will be calculated as follows but not less than \$0:  
*(Monthly Charger Fee + (Incentive × Number of Charging Stations)) × Remaining contract life = buyout fee \**
12. All the terms and charges in the Customer's rate schedule, other than those specifically included here, continue to apply to electric service provided under this rider.