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July 31, 2015

AZ CORP COMMISSION  
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Docket Control  
Arizona Corporation Commission  
1200 W. Washington Street  
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Arizona Corporation Commission  
DOCKETED

JUL 31 2015

RE: Emerging Technologies, Docket No. E-00000J-13-0375  
Response to Commissioner Bob Burns' July 9, 2015 Letter

DOCKETED BY

Dear Commissioner Burns;

Arizona Public Service Company (APS or Company) appreciates the opportunity to provide additional information on its energy efficiency (EE) technologies and strategies in response to your letter. APS has a strong history of providing cost effective energy efficiency programs for its customers and embraces new technologies and innovative strategies. APS continuously monitors the market, assesses customer preferences, and evaluates the cost-effectiveness of new technologies to assess opportunities for including new EE measures in its annual DSM Implementation Plans (DSM Plan). As part of the evaluation of new technologies, APS uses the Commission-approved societal cost test to evaluate the cost effectiveness of potential DSM programs and measures to determine if they qualify to be included in a DSM Plan.

The chart below shows technologies discussed during the 2014 Technology Innovation Workshop and indicates whether APS: (i) currently offers the technology, (ii) proposed the technology in either its 2015 or 2016 DSM Plan, or (iii) considered the technology, but did not propose it in the 2016 Plan. Please note that all of the technologies "currently offered" are proposed to be continued in the 2015 and 2016 DSM Plans.

Technology	Currently Offered	Considered		
		Proposed in 2015	Proposed in 2016	Not Proposed
Behavioral Energy Efficiency <sup>1</sup>	X		X	
Demand Response	X			
Demand Response w/ Behavior <sup>2</sup>	X		X	
Combined Heat and Power	X			
Strategic Energy Management <sup>3</sup>	X			X
Conservation Voltage Reduction		X	X	
Integrated Energy Efficiency	X			
Smart Thermostats			X	
Residential Energy Automation				X
Enhanced Analytics <sup>4</sup>		X	X	

NOTES:  
<sup>1</sup> Currently offered for residential customers; proposed in 2016 for small/medium business customers.  
<sup>2</sup> Currently offers time-of-use rates; proposed in 2016 to expand behavior demand response to residential customers.  
<sup>3</sup> Currently offers Energy Information Service (EIS); not proposing Strategic Energy Management as described in Workshop.  
<sup>4</sup> While not explicitly described in 2015 or 2015 Plans, currently exploring as means of enhancing savings & target marketing.

**1. APS currently offers many of the technologies discussed during the 2014 Emerging Technologies Workshops (Workshop) through its already approved DSM programs.**

Behavioral Energy Efficiency

- APS has offered behavioral energy efficiency to residential customers through the Conservation Behavior Program since 2011. This program provides participating customers with periodic Home Energy Reports containing information designed to motivate them to adopt energy conservation behaviors.
- APS uses Opower, a company which presented this concept at the Workshop, to implement its Conservation Behavior Program.

Behavioral Energy Efficiency involves working with customers to help them manage their energy use and achieve savings through behavioral changes, rather than through equipment purchases. The program provides direct-mailed reports to participants that show how the energy usage in their home compares with energy efficient homes and other homes similar to theirs. The reports also offer energy efficiency tips and actions that can reduce energy use.

Demand Response and Demand Response with Behavioral Approach

- APS has offered demand response to commercial and industrial customers through the Peak Solutions program since 2010.
- APS offers demand response utilizing behavioral approaches by offering a variety of rates, including time of use rates, which send time differentiated price signals to customers.

Demand response programs focus on modifying customers' electricity consumption patterns, both the quantity and timing of customer's demand and usage. This is achieved through intentional actions taken by an affected utility or a customer because of changes in prices, market conditions, or threats to system reliability. For years, APS has offered a wide range of demand response rates and programs for both residential and non-residential customers. Specifically, the APS Peak Solutions program is available to commercial and industrial customers in the Phoenix and Yuma areas. It utilizes both direct and manual load control to reduce energy demand at certain hours of the year when the demand for electricity is high.

Combined Heat and Power (CHP)

- APS has provided the option for incentives through the Solutions for Business program for qualifying custom CHP projects since 2006.

CHP technology uses a primary energy source to simultaneously produce electrical energy and useful process heat, as described by both Horizon Power Systems and PV Advanced Concepts during the Workshop. CHP projects are generally capital intensive and highly individualized, making them a candidate for a custom Solutions for Business incentive, rather than prescriptive incentives. While no customers have submitted CHP projects to date, qualifying projects would be eligible for custom energy efficiency incentives through the Solutions for Business Program. When determining whether a CHP project qualifies for incentives, APS would perform a project-specific benefit/cost analysis to determine the cost effectiveness for the proposed project. Additionally, APS would review the project to ensure that it does not double-count savings by applying for incentives from both APS and Southwest Gas for the same project.

### Strategic Energy Management

- APS has offered a similar service, called the Energy Information Service (EIS) program, to commercial and industrial customers since 2006.

Strategic Energy Management is a continuous improvement approach to reducing energy intensity over time, characterized by demonstrated customer commitment, planning and implementation, and systematic measurement. The EIS program provides 15-minute interval electric usage data to commercial and industrial customers through a web-based energy information tool that can be used to improve or monitor energy usage patterns, reduce energy use, reduce demand during on-peak periods, and better manage their overall energy operations.

### Conservation Voltage Reduction (CVR)

- APS has requested approval in its 2015 and 2016 DSM Plans to count the energy savings from its CVR project under APS's System Savings Initiative.<sup>1</sup>

CVR, also known as Distribution Voltage Optimization, includes a collection of sensors, voltage measuring and regulating control devices, analytical software, and communications products, that work together to allow a utility to continuously analyze and control distribution power factor and system voltage. Studies have shown that CVR systems provide enhanced voltage control and allow for average energy reduction of approximately 1.5% on participating distribution feeders.

### Integrated Energy Efficiency and Demand Response

- APS currently looks for opportunities, where appropriate, to integrate energy efficiency measures with demand response actions as it implements its programs with customers.

Integrated energy efficiency and demand response refers to taking a broader view of the opportunities for EE and DR within a customer's household or business. APS currently looks for those opportunities either through a comprehensive energy audit of a facility or through contractors who do onsite assessments with customers and recommend opportunities for both energy efficiency and demand response.

- 2. APS considered many of the new technologies discussed at the Workshops as part of its 2016 Plan; many of the new technologies were included in the Plan, while others were either considered too early in their commercial development or were found not to be cost-effective and therefore were not included in the Plan.**

### **Included in the 2016 Plan:**

#### Behavioral Energy Efficiency

- APS proposes in its 2016 DSM Plan to expand its Conservation Behavior program to include business customers.

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<sup>1</sup> The APS System Savings Initiative was created in accordance with Decision No. 74406, which ordered that the Company may count towards compliance with the Energy Efficiency Standard cost effective energy savings from improvements to APS facilities and generation systems, subject to measurement and review.

### Demand Response with Behavioral Approach

- APS proposes to introduce a behavioral demand response approach to some of the existing residential Home Energy Report recipients.

The enhanced Home Energy Report Program will provide event-based messaging to approximately 50,000 report recipients, with the goal of achieving peak demand reductions and added energy efficiency savings during the highest system peak days of the year. Within 24 hours preceding a day during which system demand is expected to be higher, APS will send these households a communication (*i.e.* e-mail or voice recording or opt-out options) informing them that demand for energy is likely to spike the following day during specific hours; the customers will be asked to reduce usage and household specific tips are provided. After the event, customers will receive feedback informing them how much they reduced their usage compared to other similar households.

### Smart Thermostats

- APS is proposing incentives for smart thermostats in its 2016 DSM Plan.
- Smart thermostats are the platform from which integrated DSM and residential energy automation may grow in the future. EcoFactor, a presenter at the Workshop, discussed how a home's smart thermostat would be the integral piece for residential energy automation.

APS is proposing smart thermostat incentives both for residential customers, through the Consumer Products program, and for non-residential customers, through the APS Solutions for Business Program. Internet enabled, "learning capable" smart thermostats are an emerging technology with the potential to fundamentally change how customers interact with their HVAC system, offering convenient features that customers can use to manage their energy use. These thermostats overcome the challenges of earlier programmable thermostats by using technology to automatically adjust thermostat settings and optimize HVAC operation by learning users' patterns over time. APS has determined that smart thermostats are a cost effective energy efficiency measure and are thus proposed in the 2016 Plan, with a benefit/cost ratio of 1.55, as offered through the residential Consumer Products program.

### Enhanced Analytics

- APS is currently exploring options with qualified energy efficiency suppliers, including ones who presented at the Workshop, to conduct enhanced analytics that will help increase energy savings through its DSM programs.
- APS has issued an RFP to energy efficiency suppliers to conduct enhanced energy data analytics that will identify non-residential customers who may have a high potential for energy savings through our Solutions for Business program.

### **Not Included in the 2016 Plan:**

#### Strategic Energy Management

- APS considered proposals from competitive suppliers who provide Strategic Energy Management services in 2014, but concluded that the cost of this service per kWh saved was too high to implement at the current time. As described by Triple Point Energy in the Workshop, this approach is typically implemented with a small number (8 to 12) of very large industrial customers and has a long project completion cycle (over 1 year).

Residential Energy Automation (REA)

- APS considered, but did not purpose, a comprehensive Residential Energy Automation program for inclusion in its 2016 DSM Plan because such a program requires the full integration and combination of a number of new technologies that are either not yet commercially available or are not cost-effective at this time. APS is currently exploring residential home energy automation technologies through a combination of research and pilots to assess the feasibility of these technologies.
- 3. APS reviewed, analyzed and considered a number of other new technologies and strategies when preparing its 2016 DSM Plan. While a few have been proposed in the 2016 DSM Plan, others were not proposed because they did not meet the criteria for being cost-effective.**

APS's 2016 DSM Plan proposes a number of new measures and technologies that were not discussed during the Workshops. New technologies or measures that passed the benefit/cost test as prescriptive measures include: Western Cooling Control Device (residential and non-residential), Electrically Commutated (EC) Motors for HVAC (non-residential), Linear LEDs (non-residential), and LED Streetlights (non-residential). Details for these measures were provided in the 2016 Plan and the corresponding work papers.

APS also considered numerous other technologies that were not included in the 2016 DSM Plan because they did not pass the societal cost test. Below is an example of the technology considered and analyzed, with its associated benefit/cost ratio.

Measure	Benefit/ Cost Ratio
<b>Residential</b>	
Heat Pump Water Heater	0.60
Solar Water Heater	0.25
Dishwasher	0.04
Smart Strips	0.95
Window Film	0.66
<b>Non-Residential</b>	
Single Phase AC & Heat Pump Units	0.94
Outside Air Economizer	0.97
Motor Rewind	0.89
Refrigeration Night Covers	0.72
High-Efficiency Ice Makers	0.83
Evaporator Fan Motor Controls	0.53
Smart Strips	0.56
LED Channel Signs	0.60
LED - Pedestrian Signs	0.88
LED Troffers	0.59
Evaporative Pre-Cooling on Condenser	0.50
Coolerado - Indirect Evaporative Cooling	0.08
Solar Water Heater	0.26

Every year APS reviews a variety of new and emerging technologies and assesses how they might be adapted into a cost-effective program or measure that the Company could incorporate into its DSM Plan to meet the Energy Efficiency Standard. APS will continue to work with stakeholders and the Commission to analyze new technologies that promote energy efficiency and meet the defined benefit/cost requirements. The Company welcomes the opportunity to discuss any of the technologies addressed in this letter with the Commission, should there be any questions on these items or anything else that is contained in APS's 2015 and 2016 DSM Plans.

Sincerely,

A handwritten signature in black ink that reads "Greg" followed by a large flourish, and then "for Greg Bernosky" written below it.

Gregory L. Bernosky

Director of State Regulatory and Compliance

GB/kr

cc: Parties of Record

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