

1 **BEFORE THE ARIZONA CORPORATION COMMISSION**

2 COMMISSIONERS

3 KRISTIN K. MAYES, Chairman  
4 GARY PIERCE  
5 PAUL NEWMAN  
6 SANDRA D. KENNEDY  
7 BOB STUMP

8 IN THE MATTER OF ARIZONA PUBLIC  
9 SERVICE COMPANY'S REQUEST FOR  
10 APPROVAL OF ITS 2010 ENERGY  
11 EFFICIENCY IMPLEMENTATION PLAN

DOCKET NO. E-01345A-08-0172

**REQUEST FOR APPROVAL OF 2010  
ENERGY EFFICIENCY  
IMPLEMENTATION PLAN**

12 Arizona Public Service Company ("APS" or "Company") makes this filing in  
13 compliance with the Demand Side Management provisions contained in the Proposed  
14 Settlement Agreement (the "Agreement") filed with the Arizona Corporation Commission  
15 ("Commission") on June 12, 2009, Docket No. E-01345A-08-0172 ("APS's Rate Application  
16 Docket").

17 **I. PROCEDURAL BACKGROUND**

18 APS's Rate Application Docket was commenced by APS filing a rate application on  
19 March 24, 2008. At a procedural conference held on April 21, 2009, APS, Staff and the other  
20 participating interveners indicated that they had reached an agreement in principle on revenue  
21 requirement and that substantial agreement had been reached on other issues. On May 4,  
22 2009, the Settling Parties filed a Term Sheet outlining the agreement in principle reached with  
23 APS. On June 12, 2009, Staff (on behalf of the signatories to the Agreement) filed the  
24 Agreement. The Agreement addressed the topics contained in the Term Sheet, which  
25 included Demand Side Management ("DSM") terms and conditions.

26 **II. 2010 ENERGY EFFICIENCY IMPLEMENTATION PLAN OVERVIEW**

27 APS submits this 2010 Energy Efficiency Implementation Plan ("2010 EE Plan") for  
28 Commission approval, which includes provisions necessary to achieve the energy savings

1 goals agreed to by the parties to the Agreement. Pursuant to the Agreement, APS urges that  
2 the timing of Commission consideration on the 2010 EE Plan be prior to or concurrent with  
3 the consideration of the Agreement.<sup>1</sup> To implement the 2010 EE Plan, APS is estimating a  
4 2010 EE Budget of \$49.9 million.<sup>2</sup>

5 The DSM provisions of the Agreement required that APS file an implementation plan  
6 describing new and/or expanded programs or program elements necessary to achieve the 2010  
7 energy efficiency goal, estimated energy savings by program, and a range of estimated  
8 program costs by program necessary to meet the goal. In compliance with the DSM  
9 provisions of the Agreement, the 2010 EE Plan includes the following:

- 10 • A description of all program enhancements proposed for 2010;
- 11 • Detailed program plans for all new programs and measures with sufficient detail to  
12 conduct a benefit/cost analysis and determine if these new programs and measures  
13 are cost effective;
- 14 • Brief descriptions of all proposed programs, both new and existing, that will be  
15 included in the DSM portfolio for 2010;
- 16 • Projected budgets, by program and by budget category, for all programs in the  
17 portfolio;
- 18 • Expected program impacts, including annual megawatt hour (“MWh”) and  
19 megawatt (“MW”) savings, lifetime MWh saved, societal benefits, societal costs,  
20 and net benefits to customers;
- 21 • Estimated performance incentive amounts, based both on net benefits and on total  
22 program costs; and
- 23 • Anticipated environmental benefits from the implementation of the proposed  
24 programs.

27 <sup>1</sup> Implementation of the 2010 EE Plan is expressly contingent upon approval of the Agreement.

28 <sup>2</sup> APS is also estimating Demand Response costs of \$2.8 million for 2010. This would bring total estimated DSM 2010 costs to \$52.7 million.

1 Outlined below are the specific programs or measures that APS was required to  
2 include in its 2010 EE Plan pursuant to the Agreement. They are:

3 ***1. Plan To Serve At Least 1,000 Existing Homes Under The Home Performance***  
4 ***Element By December 31, 2010***

5 APS proposes to modify the current Residential Existing Homes HVAC and Home  
6 Performance Program by enhancing the Home Performance energy assessment with a direct  
7 install program element, along with adding new rebates for attic insulation, building air  
8 sealing and shade screens. The addition of these new program elements will allow APS to  
9 reach 1,000 existing homes (customers) by December 31, 2010.

10 ***2. Plan To Review APS's Low Income Weatherization Program***

11 Changes to the federal Weatherization Assistance Program ("WAP") have changed the  
12 relationship between the WAP program and the APS Energy Wise Low Income  
13 Weatherization Program. In order to ease the implementation of both programs by the local  
14 community action agencies, APS is requesting that the percent of Federal Poverty Level  
15 qualification be made consistent with the federal WAP program and that the reach of the APS  
16 Low Income Weatherization program be expanded to include multi-family public housing  
17 projects.

18 ***3. Customer Repayment/Financing Program***

19 Upon approval of the Agreement, APS will add a customer repayment financing  
20 program element for schools, municipalities, and small businesses that will be fully integrated  
21 into the appropriate Non-Residential Programs. This program element will give qualified  
22 customers a choice on how to fund their APS Solutions for Business energy efficiency  
23 projects.

24 ***4. Add A Non-Residential High Performance New Construction Program Element***  
25 ***With A Second Tier Of Performance And A Higher Financial Incentive***

26 APS proposes to add a new program element to the "whole building" custom measure  
27 for the Non-Residential New Construction Program. This new element will provide  
28 graduated incentives to customers and the building designers based upon "whole building"  
energy performance relative to standard construction practices.

1           **5. Plan to Install Measures Through Existing DSM Programs or Enhanced**  
2           **Program Elements at 100 Schools By December 31, 2010**

3           APS's school-focused program is designed to designate funding for public school  
4 buildings, including charter schools, to participate in APS Solution for Business programs.  
5 Through a variety of program offerings, APS will strive to have at least 100 schools complete  
6 energy efficiency projects within the program by December 31, 2010.

7           The Agreement also required APS to file a residential high performance new home  
8 program element with a second tier of performance and a higher financial incentive, which  
9 APS filed on June 29, 2009. Finally, the Agreement called for a Large Non-Residential  
10 Customer Self Direction option to be made available in 2010. Details of that option are  
11 provided in the 2010 EE Plan.

12           APS estimates that the 2010 EE Plan will save an annual 320,000 MWh in 2010, while  
13 saving an estimated 3,543,000 MWh over the lifetime of the measures installed in 2010. The  
14 expected costs are \$49.9 million in 2010, with anticipated net benefits to customers over the  
15 lifetime of the program measures of over \$100 million. APS believes the programs in the  
16 2010 EE Plan are cost effective and will provide all APS customers with significantly  
17 increased opportunities to save on their monthly electric bills.

18           **III. DEMAND SIDE MANAGEMENT ADJUSTMENT CHARGE ("DSMAC")**

19           Under the provisions of the Agreement and the Plan of Administration for the  
20 DSMAC, APS is also filing for approval of a new DSMAC charge effective with cycle 1 of  
21 March 2010. As is described in the testimonies of the Settling Parties' witnesses, including  
22 Mr. Wontor and Mr. Rumolo of APS, the DSMAC called for under the Agreement allows for  
23 more concurrent recovery of DSM/EE program costs and incentives. Because 2010 will be a  
24 transition year from the previous DSMAC, which recovered costs on a lagged basis, the  
25 DSMAC charges for 2010 would recover both unrecovered 2009 program costs (estimated to  
26 be \$16 million after the \$10 million recovered in base rates) and the costs for the 2010 EE  
27 Plan (estimated to be \$42.7 million after the \$10 million recovered in base rates). To  
28 moderate the impact of what would otherwise be a one-time overlap in annual previous year

1 cost recovery, APS is offering an alternative for the Commission's consideration. In lieu of  
2 collecting all unrecovered 2009 costs in 2010, APS could spread the 2009 costs over three  
3 years without interest. As shown in Attachment 6, the total costs to be recovered through the  
4 DSMAC charge for 2010 would be reduced by approximately \$10.7 million with  
5 corresponding increases to costs to be recovered for 2011 and 2012.

6 **IV. CONCLUSION**


7 For the reasons stated herein, APS requests that the Commission approve:

8 1. The 2010 EE Plan, including the programs and program elements as described  
9 herein; and

10 2. A DSMAC of \$0.002053/kWh for non-demand billed customers and  
11 \$0.898135/kW for demand billed customers effective with cycle 1 of March 2010, or the  
12 Commission may elect to choose the amortization of the 2009 costs over three years (2010-  
13 2012) resulting in a DSMAC charge of \$0.001680/kWh for non-demand billed customers and  
14 \$0.734957/kW for demand billed customers, effective with cycle 1 of March 2010.

15 RESPECTFULLY SUBMITTED this 15th day of July, 2009.

16 PINNACLE WEST CAPITAL CORPORATION  
17 LAW DEPARTMENT

18  
19 By:   
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23 ORIGINAL and thirteen (13) copies  
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25 July, 2009, with:

26 Docket Control  
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///

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3 *See attached list of parties.*

4  A handwritten signature in cursive script that reads "Donna Turner". The signature is written in black ink and is positioned above a horizontal line that extends to the right.

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**2010**  
**Energy Efficiency**  
**Implementation Plan**

**July 15, 2009**

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## I. Executive Summary

The 2010 Energy Efficiency Implementation Plan (“2010 EE Plan”) complies with the Proposed Settlement Agreement (the “Agreement”) filed with the Arizona Corporation Commission (“Commission”) on June 12, 2009. Section 14.10 of the Agreement reads, in part:

“By July 15, 2009, APS shall file for the Commission’s approval in this Docket the 2010 Energy Efficiency Implementation Plan with new and/or expanded programs or program elements necessary to achieve the 2010 energy efficiency goal ...”

This Plan includes the following:

- A description of all program enhancements proposed for 2010, including both those required by the Agreement and those not mentioned in the Agreement;
- Detailed program plans for all new programs and measures with sufficient detail to conduct a benefit/cost analysis and determine if these new programs and measures are cost effective or not;
- Brief descriptions of all programs, both new and existing, proposed to be included in the Energy Efficiency Portfolio for 2010;
- Projected budgets, by program and by budget category, for all programs in the portfolio;
- Expected program impacts, including annual MWh and MW savings, lifetime MWh saved, societal benefits, societal costs, and net benefits to customers;
- Estimated performance incentive amounts, based both on net benefits and on total program costs; and
- Anticipated environmental benefits from the proposed programs.

In summary, the proposed Energy Efficiency Program Portfolio for 2010 is estimated to save an annual 320,000 megawatt hours (“MWh”) of energy and 60 megawatts (“MW”) of peak demand in 2010, while saving an estimated 3,543,000 MWh over the lifetime of the measures installed in 2010. Implementing the 2010 EE Plan is expected to cost an estimated \$49.9 million in 2010, but produce over \$100 million of net benefits to customers. APS believes all of the proposed programs will be cost effective (as measured by the Total Resource Cost test) and will provide all APS customers with significantly increased opportunities to save on their monthly electric bills.

APS, in this filing, is asking the Commission to approve:

1. The 2010 EE Plan, including the programs and program elements as described herein; and
2. A DSMAC of \$0.002053 per kilowatt hour (“kWh”) for non-demand billed customers and \$0.898135 per kilowatt (“kW”) for demand billed customers effective with cycle 1 of March 2010, or the Commission may elect to choose the amortization of the 2009 costs over three years (2010–2012) resulting in a DSMAC charge of \$0.001680/kWh for non-demand billed customers and \$0.734957/kW for demand billed customers, effective with cycle 1 of March 2010.

## II. Introduction

This 2010 Energy Efficiency Implementation Plan (“2010 EE Plan”) meets the requirements of the Proposed Settlement Agreement dated June 12, 2009 (the “Agreement”) between the settling parties<sup>1</sup> and is contingent on final Arizona Corporation Commission (“Commission” or “ACC”) approval of the Agreement in Docket E-01345-A-08-0172. This 2010 EE Plan provides an overview of the current energy efficiency programs and new or expanded program enhancements necessary to achieve the energy savings goals agreed to in the Agreement. The annual energy efficiency savings goals are as follows:

2010	320,000 MWh	estimated to be 1.00% of total energy resources in 2010
2011	400,000 MWh	estimated to be 1.25% of total energy resources in 2011
2012	490,000 MWh	estimated to be 1.50% of total energy resources in 2012

Arizona Public Service Company (“APS” or “Company”) is committed to cost effective energy efficiency. This 2010 EE Plan provides an overview of APS’s plan to fulfill the 2010 goal of energy efficiency savings of 1% of APS retail total energy resources or 320,000 MWh. Moreover, this 2010 EE Plan proposes the continuation of existing energy efficiency programs, with key additions and enhancements, and proposes a new budget for 2010.

APS is requesting approval of overall program spending of \$49.9 million for the year 2010 in order to achieve the goal of 320,000 MWh of annual energy savings. As part of Decision No. 67744, Docket No. E-01345A, the Commission required APS to implement and maintain a collaborative Demand Side Management (“DSM”) working group to solicit and facilitate stakeholder input, advise APS on program implementation, develop future DSM programs, and review DSM program performance. This 2010 EE Plan was developed and enhanced in conjunction with input from the DSM Collaborative Group of energy efficiency experts and stakeholder representatives, including members of Commission Staff, RUCO, SWEEP, WRA, the Department of Commerce Energy Office, AECC and others. Discussions regarding this 2010 EE Plan took place with DSM Collaborative Group members during the settlement negotiation process and the DSM Collaborative Group was formally convened for input regarding this plan on June 12, 2009. In addition, a draft of this document was forwarded to all collaborative members for their review and input.

This 2010 EE Plan targets an energy efficiency savings goal of 320,000 MWh with a corresponding budget guideline, estimates of demand savings, a societal net benefits projection for each of the energy efficiency programs, and an estimate of the performance incentive. The primary timing assumptions contained in the 2010 EE Plan relative to the participation levels, savings estimates, and 2010 program budgets are that:

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<sup>1</sup> Settling Parties include the Arizona Corporation Commission Utilities Division Staff; APS; the Residential Utility Consumer Office (“RUCO”); Arizona Association of School Business Officials (“AASBO”); Arizona School Boards Association (“ASBA”); Southwest Energy Efficiency Project (“SWEEP”); Arizonans for Electric Choice and Competition (“AECC”); Arizona Investment Council (“AIC”); Arizona Agricultural Group (“Az-Ag Group”); Cynthia Zwick; IBEW Locals 387, 640 and 769 (“IBEW”); Bowie Power Station, L.L.C.; Freeport McMoRan Copper & Gold Inc (“Freeport McMoRan”); Mesquite Power, L.L.C.; Southwestern Power Group II; Western Resources Advocates (“WRA”); and the Kroger Company.

- The Agreement is approved by the Commission by year end 2009; and
- This 2010 EE Plan (in its entirety and with its corresponding budget) is approved by the Commission no later than November 30, 2009.

These key dates will allow APS adequate time to implement the new program enhancements in the first quarter of 2010 and, therefore, optimize the chance to achieve the annual savings estimated in the 2010 EE Plan.

### III. Energy Efficiency Portfolio

APS proposes to continue and expand its current portfolio of energy-efficiency DSM programs that reduce the use of electricity by means of energy-efficiency products, services or practices. The programs are designed to influence energy decisions by residential and non-residential customers and other market players through a combination of rebates and incentives, technical assistance and training, and consumer education. The approval of this 2010 EE Plan supersedes the Commission’s previous approval of the 2008–2010 DSM Portfolio Plan in Decision No. 70666. This 2010 EE Plan is considerably more aggressive than the original 2008–2010 Portfolio Plan, which is necessary to achieve the more aggressive energy savings goals established in the Agreement. Other than the new programs and measures described in this 2010 EE Plan, the other energy efficiency programs, features and measures are defined in the ACC Decisions and filings summarized in Table 1.

**Table 1  
DSM / Energy Efficiency Decisions and Filings**

<b>Decision #</b>	<b>Effective Date</b>	<b>Description</b>
67744	4/7/2005	Established funding for DSM at \$10M per year in base rates and an additional \$6M per year through a DSM Adjustment Charge (“DSMAC”). It further established the semi-annual filing guidelines and directed APS to create a DSM collaborative working group and submit a final DSM plan for Commission approval.
Portfolio Plan	7/1/2005	APS filed an application for approval of its DSM Portfolio Plan and related Residential and Non-Residential programs. Revisions were filed on November 14, 2005 and November 21, 2005
68064	8/17/2005	Commission approved the lighting portion of APS' Residential Consumer Products DSM Program.
68488	2/23/2006	Interim approval for the Non-Residential DSM program from 2005-2007.
68648	4/12/2006	Commission approved the Residential New Construction Program, Residential Existing Homes HVAC Program, Consumer Products flexibility, and MER portion of APS' Portfolio Plan.
68647	4/12/2006	Commission approved the Low Income program.
69663	6/28/2007	Ordered APS to credit any unspent DSM funds to the balance of the DSMAC and that the unrecovered DSM adjustment balance accrue interest. Approved APS' performance incentive.
69879	8/28/2007	Authorized an additional \$3.5M for APS' Non-Residential Existing Program rebates & incentives. Also authorized removal of the 52% cap for Rebates and Incentives. Also included changes to the Residential AC program.
70033	12/4/2007	Ordered that \$390,000 within the Consumer Products program be shifted from Appliances to Compact Fluorescent Lamps.
70637	12/11/2008	Commission approved the Non-Residential Program
70666	12/24/2008	Commission approved the 2008 – 2010 DSM Portfolio Plan and budget.

Decision #	Effective Date	Description
70960	4/7/2009	Commission approved the Residential HVAC Program changes
70961	4/7/2009	Commission approved the initial DSMAC charge, which took affect with Cycle 1 of April 2009.

The energy efficiency programs in this 2010 EE Plan are expected to produce cost effective long-term energy consumption and demand savings. For programs implemented in 2010, the program cost is estimated to be 1.4 cents per lifetime kWh saved (total estimated program dollars divided by the total estimated kWh saved over the expected lifetime of all measures installed in 2010). Table 2 summarizes the estimated energy and demand savings and total program net benefits as a result of proposed program activities in 2010. These benefits will be in addition to the benefits already achieved by programs from 2005 through 2009, which are not included in the estimated impacts in Table 2. For 2010, the APS energy efficiency programs are estimated to save approximately 60 megawatts (“MW”) of demand and 3.5 million lifetime MWh of energy. For more detail on the savings and net benefits achieved prior to 2010, *see* the Company’s DSM semi-annual report filings.

**Table 2**  
**Energy Efficiency Goals 2010**

Program Budget	Annual MWh Savings	Lifetime MWh Savings*	Peak Demand Savings (MW)	Total Net Benefits*
<b>\$49.9 Million</b>	<b>320,000</b>	<b>3,543,000</b>	<b>60.0</b>	<b>\$102.0 Million</b>

*\*Refers to savings and total net benefits over the expected lifetime of all program measures installed in 2010. The Total Net Benefits estimate incorporates all program costs including the cost of Measurement, Evaluation & Research and Performance Incentives, and it is the difference between the present value of the societal benefits and the present value of the societal costs.*

APS’s program portfolio continues to include a balanced mix of programs aimed to address APS’s diverse customer segments and market opportunities including: residential existing homes; residential new construction; consumer products; residential low income; non-residential existing buildings; non-residential new construction and renovation; schools; and small business.

In order to achieve the targeted savings of 320,000 MWh in 2010, a number of new programs or program elements and revised program features are proposed to be added to the 2010 program offerings, including:

- Residential Existing Homes – Modifies the current program by enhancing the Home Performance energy audit with a Direct Install program element, along with new rebates for attic insulation, building air sealing and shade screens.

- Residential Consumer Products – Adds new measures for improving energy efficiency of residential swimming pools, including rebates for variable and dual speed pool pumps and energy efficient smart digital pool timers.
- Residential Appliance Recycling – A new program aimed at removing functioning, but energy inefficient, second refrigerators and freezers from residential homes.
- Residential New Construction – Adds a new high performance home measure which provides an incentive to builders who build homes that are 30% more energy efficient than standard homes. [Note: This measure was filed separately with the Commission for approval on June 29, 2009, but impacts from the proposed measure are included in this 2010 EE Plan.]
- Residential Low Income Customers – Adds program enhancements aimed at making the program consistent with the federal weatherization program and expanding the base of eligible customers.
- Non-Residential New Construction – Adds a whole building design incentive with the amount of the incentive increasing as the savings, compared to standard construction, increases.
- Non-Residential Customer Repayment Financing – Adds a financing option for small business, municipal, and school customers who wish to finance their energy efficiency projects and pay back the financing with their energy savings.
- Large Non-Residential Self Direction – Adds a program feature which allows very large customers the option of Self Directing a portion of their DSM contributions to their own energy efficiency projects.
- Non-Residential Schools Program – Increases the annual customer cap from \$25,000 to \$100,000 to allow larger school projects to be funded at a higher level than before.

The next two sections (IV and V) give a brief overview of the ten programs that make up the entire proposed energy efficiency portfolio for 2010. Section IV describes the Residential programs and Section V describes the Non-Residential programs. Section VI then outlines the various proposed program enhancements included in the 2010 energy efficiency portfolio.

## **IV. Residential Programs**

### ***A. Consumer Products***

The primary target market for Consumer Products is APS residential customers who are looking to purchase lighting and other energy using products for their homes. This program is being implemented through participating retailers within the APS service territory.

This current program promotes high-efficiency Environmental Protection Agency (“EPA”)/Department of Energy (“DOE”) ENERGY STAR® approved lighting. The program solicits discount pricing from Compact Fluorescent Lamps (“CFL”) manufacturers and distribution of CFLs through local retailers. Customers are referred 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



provides sales training for participating retailers and consumer education, including in-store point-of-sale displays.

APS is proposing to add three new measures to the Consumer Products program that are designed to improve the energy efficiency of residential swimming pools. Variable speed and dual speed pool pumps with energy efficient motors are now available that can save over 1,000 kWh annually while maintaining or improving pool cleanliness. The measure would provide incentives to consumers, retailers and installers to help overcome the higher initial cost of these pumps and promote their increased adoption in the market place. In addition, a new type of smart digital pool pump timer is now available. It works with existing pool pumps as a replacement for mechanical timers and it provides significant savings by automatically adjusting pool pump run times monthly to automatically reduce use in cooler months, while maintaining pool cleanliness. APS proposes a consumer instant rebate to encourage more use of these energy saving timers. For more information about the new measures in the Consumer Products program, *see* Attachment 1.

### ***B. Residential Existing Homes – HVAC and Home Performance***

The Residential Existing Homes Heating, Ventilation, and Air Conditioning (“HVAC”) and Home Performance program promotes a whole house approach to energy efficiency. The program includes measures supporting energy efficient residential air conditioning and heating systems along with the proper installation, maintenance and repair of these systems. The program provides training and technical assistance for contractors and education for consumers about the benefits of energy-efficient heating and cooling systems, air sealing, insulation and other methods to improve a home’s energy efficiency and comfort. Through the APS Qualified Contractor program, APS provides customer referrals to contractors who meet strict program requirements for professional standards, technician training and customer satisfaction. This program uses a combination of financial incentives, contractor training and consumer education to promote the proper installation of energy efficient HVAC systems in existing residential homes within the APS service territory.

The Air Conditioner (“AC”) Rebate with Quality Installation measures build on the existing APS Qualified Contractor program. They offer financial incentives to homeowners for buying energy efficiency equipment ( $\geq 13$  SEER/10.8 EER), if that equipment is installed so that it meets the program requirements for air flow, refrigerant charge and sizing. The Duct Test and Repair measure provides financial incentives to customers for having their HVAC system’s duct work tested and repaired.

Pursuant to the Agreement, APS proposes the enhancement of this element of the program: an on-site comprehensive home assessment and efficiency improvement program called Home Performance with ENERGY STAR®. The program builds on the well recognized ENERGY STAR® brand and a program framework developed by the EPA and the DOE that has been successfully implemented in several other states. The program will offer energy audits to identify opportunities for energy savings, and provide incentives and access to financing to encourage energy efficiency home upgrades including insulation, shade screens, air sealing, duct sealing, HVAC upgrades and other recommendations. Pursuant to the terms of the Agreement, this program element has a goal to serve at least 1,000 existing homes with

on-site assessments by December 31, 2010. For more information about the Home Performance program element, *see* Attachment 2.

### ***C. Residential New Construction***

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

In response to Decision No. 70666, Docket No. E-01345A, APS filed an application for approval of a new higher performance program measure that offers builders a higher incentive to meet significantly higher efficiency levels, with homes required to be at least 30% more efficient than current code. When combined with APS incentives for renewable energy, this program measure is designed to move the new homes market toward net zero energy consumption in the future. For more information about the new high performance homes measure, *see* Attachment 3 for the program savings and net benefits information and the APS filing with the Commission dated June 29, 2009 for all other information.

### ***D. Appliance Recycling***

As the newest program in the energy efficiency portfolio mix, the proposed Appliance Recycling Program will target the removal of functional second refrigerators and freezers in households. The average household replaces a refrigerator every ten (10) years. However, many of the refrigerators and freezers being replaced are still functioning and often end up as underutilized energy-guzzling backup appliances in garages and basements. APS proposes to offer a rebate and free pick-up and recycling of operable second refrigerators or freezers to encourage recycling these older inefficient appliances. This program is currently being implemented successfully by utilities in many states, including SRP in Arizona. For more information about the Appliance Recycling program, *see* Attachment 4.

### ***E. Low Income Weatherization***

APS’s Energy Wise Low Income Assistance Program is designed to improve the energy efficiency, safety, and health attributes of homes occupied by customers whose income falls within 150% of the federal poverty guidelines. 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. In addition, low income families are provided crisis bill assistance. The program is administered by various community action agencies throughout APS’s service territory.

Pursuant to the Agreement, APS is proposing to enhance the scope of the existing Energy Wise Low Income Assistance Program (also referred to as the Low Income Weatherization program). Specifically, APS is proposing to make the program more consistent with the federal Weatherization Assistance Program (“WAP”), to expand the scope to include multi-

family public housing projects, and to include additional weatherization measures under the program.

## **V. Non-Residential Programs**

The five Non-Residential energy efficiency programs are marketed under the APS Solutions for Business program name. Other than the Energy Information Services, the programs (Non-Residential Large Existing, New Construction, Small Business, and Schools) are implemented in conjunction with KEMA (APS' Non-Residential program implementation contractor). The Energy Information Services Program is implemented by Automated Energy and APS. A description of each of the Non-Residential programs follows.

### ***A. Non-Residential Existing Facilities***

The primary targets for the Non-Residential Existing Facilities Program are customers who have an aggregated monthly demand greater than 100 kW. This program provides prescriptive incentives to owners and operators of large non-residential facilities for energy-efficiency improvements in lighting, HVAC, motors, building envelope, and refrigeration measures. Custom incentives are also provided for energy-efficiency measures not covered by the prescriptive incentives. Incentives are also provided to customers who conduct qualifying energy studies.

### ***B. Non-Residential New Construction***

This program includes three components: design assistance; prescriptive measures; and 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 energy-efficiency improvements in lighting, HVAC, motors, building envelope, and refrigeration applications. A proposed component within the New Construction custom efficiency measures called Whole Building Design is meant to influence customers and developers to build and invest in higher performing buildings through a stepped performance incentive structure with the financial incentives becoming larger as the building performance gets better. 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 ("USGBC"). See Attachment 5 for additional details on this proposed new program measure.

### ***C. Small Business***

The primary targets for the Small Business Program are customers who have a maximum peak aggregated demand of 100 kW or less. This program provides prescriptive incentives to small business owners for energy efficiency 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 area of lighting and refrigeration. Small Business customers are also eligible to receive incentives for energy studies and custom measures.

***D. Schools***

This program is designed to set aside funding for public school buildings, including charter schools, to participate in the APS Solution for Business programs. This program budget is reserved exclusively for school use. If schools fully subscribe this program budget or if they reach their incentive cap under this program, they can still participate in other non-residential programs. Energy efficiency 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. Through these program offerings, APS has a goal of having at least 100 schools complete projects within the program by December 31, 2010. APS is also proposing to raise the customer cap for the schools program from \$25,000 to \$100,000 per school district to reflect the added emphasis on school energy efficiency projects and the increased Schools Program budget. The goal of serving 100 schools will also be achieved by continued implementation of the current Solutions for Business program offerings, including the most recent Direct Install feature for schools which can pay up to 90% of project cost. In addition to this, schools will receive federal funds for energy efficiency projects in the coming years. APS will work to integrate the energy efficiency program incentives with these federal grants for schools.

***E. Energy Information Services***

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

**VI. Program Enhancements**

The following program enhancements are proposed in direct response to items that were required to be added to the portfolio in the Agreement dated June 12, 2009.

***A. Residential Existing Homes - Home Performance***

APS is enhancing the “Home Performance” comprehensive home assessment element of the Residential Existing Homes program with new direct installation, air sealing and insulation measures. This program has a goal to serve at least 1,000 existing homes by the end of 2010. For more information about this program element, *see* Section IV above or Attachment 2.

***B. High Performance New Construction – Residential***

Pursuant to Decision No. 70666, and as discussed in the settlement agreement, APS filed a proposed new measure to be added to the Residential New Construction program that is designed to move the market towards net zero energy homes. For more information about this new measure see Section IV or Attachment 3 of this document, or refer to the program plan that APS filed on June 29, 2009.

### ***C. Low Income Weatherization Enhancement***

The Agreement called for a “review of the APS Low Income Weatherization Program (“LIW”) for possible enhancements.” A review of the program was conducted and resulted in the following conclusions:

- The program is being implemented in compliance with Decision No. 68647.
- Decision No. 68647 states that weatherization activities in the APS Energy Wise Low Income Weatherization Program are to be conducted in accordance with the rules of the federal Weatherization Assistance Program (“WAP”). However, the American Recovery and Reinvestment Act of 2009 (“ARRA”) forced changes to the federal WAP program that have created inconsistencies between the federal WAP program and the APS Energy Wise LIW Program.
- ARRA funding has contributed to an increase in the weatherization services infrastructure and capacity designed to deliver weatherization services.
- Multifamily public housing presents an untapped opportunity to deliver very cost effective weatherization due to the economy of scale inherent in weatherizing high density housing units.
- Considering the current economic climate, there is a need to provide immediate savings via education and increased energy efficiency to low income customers awaiting weatherization services.

Therefore to address these findings, APS is proposing the following program enhancements:

- 1) Maintain consistency with the federal WAP program by approving a change that would allow the APS program to automatically match the income eligibility guideline used at the federal level. Currently, the federal WAP program is using 200% of the Federal Poverty Level (“FPL”) and the APS program is using 150% of FPL. This causes additional administrative issues with the community action agencies, which would be resolved by maintaining consistency with the federal guideline.
- 2) Follow the new federal guideline for evaporative cooler conversions to energy efficient heat pumps, which allows 50% of the cost to be considered weatherization and 50% of the remainder to be counted as health and safety. Currently, APS will pay for 100% of the cost as a health and safety measure with a doctor’s note; however, APS can not count any of the cost towards weatherization.
- 3) Provide a weatherization funding pool for non-profit 501c3 housing authorities to weatherize multi-family public housing projects that they own. There are approximately 6,800 low income public housing units in Arizona that could benefit from weatherization services. Also, with the increased capacity due to ARRA funding, there are more contractors available to perform weatherization activities and this would allow the housing authorities and other non-profits to directly weatherize their low income complexes.
- 4) Allow refrigerator replacement as part of weatherization and not just repair and replace.

- 5) Increase marketing and consumer education designed to help low income customers become more energy efficient and aware. This would include increased promotions and events and distributing weatherization kits designed to save electric energy. Currently there is still a backlog of customers waiting for weatherization services and distributing weatherization kits with low flow showerheads, CFL's, outlet insulation pads and other energy saving devices would at least help limited income customers start to save almost immediately, while they wait for weatherization services.

Table 3 shows the impact of these proposed program enhancements on the program budget.

**Table 3**  
**Low Income Weatherization Program**  
**2010 Budget Summary**

<b>Current Energy Wise LIW Program</b>	<b>Budget</b>	
	\$1,100,000	Decision No. 68647 Program Budget
<b>Proposed Program Enhancements</b>	<b>Budget Impact</b>	<b>Comments</b>
1. Increase to 200% of Federal Poverty Level	\$400,000	More people would be qualified to receive services. Budget would address weatherizing an additional 100 homes at an average cost of \$4,000 per home.
2. Evap to Heat Pump Conversions	\$0	The cost would not affect the budget since it does not result in more homes being weatherized. Instead, it means that more of the \$6,000 per home would be used for the conversion.
3. Multifamily Housing	\$720,000	200 units * average of \$3,000 per unit, plus 20% administrative costs.
4. Refrigerator Replacement	\$45,000	Max 300 refrigerators * \$150 per unit
5a. Weatherization Kits	\$37,500	500 Kits * \$75 per unit
5b. Marketing and Consumer Education	\$10,000	Increased exposure at events for marketing efforts and increased consumer education including demos and weatherization seminars.
Total Program Enhancements	\$1,212,500	
<b>Proposed Program Budget</b>	<b>\$2,312,500</b>	

#### ***D. Customer Repayment Financing Program – Non-Residential***

A customer repayment financing program element for schools, municipalities, and small business will be fully integrated into the following Non-Residential Programs:

- Large Existing Facilities
- Small Business
- Schools

This program element will be offered to give qualified customers a choice on how to fund their APS Solutions for Business energy efficiency projects. APS will offer direct monthly billing for customers to repay the principle and interest through a parallel bill to the customer's monthly electric bill. Financing costs (including any default or guarantee cost) will be fully recoverable through APS energy efficiency program costs. The APS Solutions for Business rebates will be used to reduce the customer's monthly payment.

APS will work with the Electric & Gas Industries Association ("EGIA") to find third party finance partners. EGIA is a non-profit trade organization dedicated to advancing energy efficiency and renewable energy solutions. A cornerstone offering of EGIA is a utility sponsored financing offering (National Energy Efficiency Financing Program), which couples lenders with energy efficiency providers and provides financing vehicles for customers implementing energy efficiency projects.

If APS cannot successfully find third party finance partners through EGIA, then APS may provide the capital for financing. Any financing provided directly by APS will be at its weighted average cost of capital. If APS buys down the financing rate for the customer, the differential between APS's cost of capital and such reduced rate will also be recovered as an APS energy efficiency program cost. The total amount of APS capital, if provided, will be limited to \$10 million in aggregate.

Whenever possible, APS will work with customers to advise that revolving loan funds through the ARRA State Energy Program ("SEP") are also available and could be used as financing alternatives.

The budget discussed in Section VII includes all anticipated program costs for this financing option, other than the aggregated principle (\$10 million) and any additional funds beyond the current incentive to buy down the customer's monthly payments.

#### ***E. High Performance New Construction – Non-Residential***

A high performance new construction program element called Whole Building Design will be added to the custom measure for the Non-Residential New Construction program. This high performance program element will provide increasing incentives to customers and the building designers based upon whole building energy performance compared to the energy standard ASHRAE 90.1-2007. The APS Whole Building Design incentives are designed to complement the LEED green building certification system which was developed by the United States Green Building Council ("USGBC"). Details of this new program element and the entire Non-Residential New Construction program plan can be found in Attachment 5.

### ***F. Self Direction***

Self Direction is an option that will be made available to large qualifying customers. Self Direction allows participating customers to reserve their DSM contributions, less administrative and other program costs, for their exclusive use to help fund qualifying DSM projects at their facilities. Self Direction will be offered to the largest customers since they have the ability and resources (technical knowledge, expertise, and funding) to implement effective DSM and they may desire to have the flexibility to use their DSM contributions to fund their own energy efficiency projects. The following parameters define the Self Direction option:

1. To be eligible for Self Direction, a customer must use a minimum of 40 million kWh per calendar year, based on an aggregation of all of the customer's APS accounts.
2. Qualifying Self Direction customers who choose to Self Direct their DSM funds must elect Self Direction by notifying APS in each year that they wish to Self Direct. Customers who elect to Self Direct must continue to contribute their share of DSM funds through base rates and the DSM Adjustment Charge ("DSMAC").
3. After a customer notifies APS of their intent to Self Direct, 85% of the customer's DSM contribution will be reserved for tracking purposes for the customer's future energy efficiency project. The remaining 15% will be retained to cover the Self Direction program administration, management, verification, measurement, and evaluation costs.
4. Self Direction funds will be reserved for tracking purposes for the calendar year the Self Direction election is received by APS. Such election must be received on or before December 1st. There will be no retroactive Self Direction funds set aside from prior budget years, since the Company's books were closed prior to the customer's election.
5. Self Direction funds will be paid once a year in December beginning in the year that the DSM project is completed and verified by the APS Solutions for Business team. If project costs exceed the credited amount in one year, then funding will continue to be paid in December of each year until the project is 100% funded or on the tenth year of funding, whichever comes sooner.
6. If the energy efficiency project is not completed within two (2) years of the Self Direction election date, then the Self Direction funds from the first calendar year from the Self Direction election will not be available to the customer and will revert to the program's general account.
7. Qualifying customers will be required to commit all of their facilities to the Self Direction option for the duration of the specific Self Direction project's funding period. Customers would not be able to designate some of their accounts for Self Direction, while allowing some of their other accounts to remain eligible for the



- standard APS Solutions for Business program incentives. Customers choosing to Self Direct will not be permitted to participate in any of the APS Solutions for Business program offerings for any of their accounts.
8. Aggregation would be allowed only within a given customer set of accounts, not across groups of customers. This means that groups of customers would not be able to form buying associations for the purpose of meeting the Self Direction size criteria.
  9. All Self Direction projects must be considered to be a subset of either the Company's Non-Residential Large Existing Facilities Program or New Construction Program for budgeting and energy savings purposes. The qualifying projects must be cost effective and meet the same requirements as these Non-Residential DSM Programs. Self Direction customers would apply for the same prescriptive and custom incentive measures as defined in APS' existing DSM program. However, annual customer incentive caps do not apply to Self Direction funds.
  10. Within two (2) years of the Self Direction election, an energy efficiency project application must be filed. This project application will include:
    - a. Name of the retail electricity customer;
    - b. Description of the electricity conservation project(s);
    - c. Project scope of work;
    - d. Annual energy (kWh) and peak demand (kW) savings estimate;
    - e. First cost estimate;
    - f. Project schedule; and
    - g. Calculations that support or demonstrate the electricity savings and simple payback of the project.
  11. APS Solutions for Business program staff will review the Self Direction energy efficiency project and administer the Self Direction funding and accounting. This work will include: verifying that the technologies meet the program specifications; reviewing backup documentation that supports the savings claims; and providing measurement and evaluation after the Self Direction project is in operation. All specification documentation requirements will be identical to existing program requirements.
  12. Upon completion of the final Self Direction payment, the customer may elect to continue to Self Direct by submitting another Self Direction application before December 1<sup>st</sup>. If the customer does not re-apply for Self Direction, then they will be treated like all other Non-Residential customers and will be eligible to participate in the Solutions for Business program beginning January 1st of the year following their final Self Direction payment.
  13. All kWh energy, kW demand, and environmental savings will be reported as part of the APS Solutions for Business DSM program savings and will be claimed as part of meeting the energy efficiency portfolio targets.

Although there may be some customers that elect to Self Direct in 2010, APS does not anticipate that these companies will complete their energy efficiency projects in 2010; therefore, Self Direction is not expected to have any budget impact in 2010.

## **VII. Budget**

Budget projections are based on meeting the total energy efficiency savings goal of 320,000 MWh in 2010. These budget projections are also based on recent experience in the APS market place, expected customer program participation growth, contractors' experience in similar markets, and approval of all program enhancements within this 2010 EE Plan.

Table 4 shows a summary roll-up of the anticipated 2010 spending by program. This budget represents the estimated spending required to meet the 2010 energy efficiency savings goal of 320,000 MWh. These projections are based on APS's best estimates of market penetration for each program measure. To the extent that certain programs achieve greater or lesser success and market penetration than others, it is important to be able to adjust budgets between measures accordingly to maximize the effectiveness of the overall portfolio. Table 4 also includes the budget for program measurement, evaluation, and research ("MER"), and the estimated program performance incentive for 2010.

**Table 4  
APS Energy Efficiency Programs  
2010 Budget**

Program	Rebates & Incentives	Training & Tech Assistance	Consumer Education	Program Implement	Program Marketing	Plan & Admin	Program Total Cost
<b>Residential</b>							
Consumer Products	\$ 4,212,000	\$ 12,000	\$ 30,000	\$ 1,968,000	\$ 331,000	\$ 199,000	\$ 6,752,000
Existing Homes	\$ 3,519,000	\$ 88,000	\$ 279,000	\$ 1,200,000	\$ 598,000	\$ 223,000	\$ 5,907,000
New Construction	\$ 1,650,000	\$ 99,000	\$ 19,000	\$ 199,000	\$ 352,000	\$ 99,000	\$ 2,418,000
Appliance Recycling	\$ 286,000	\$ --	\$ 19,000	\$ 911,000	\$ 182,000	\$ 30,000	\$ 1,428,000
Low Income	\$ 2,120,000	\$ 10,000	\$ 20,000	\$ 50,000	\$ 38,000	\$ 75,000	\$ 2,313,000
<b>Totals for Residential</b>	<b>\$11,787,000</b>	<b>\$ 209,000</b>	<b>\$ 367,000</b>	<b>\$ 4,328,000</b>	<b>\$ 1,501,000</b>	<b>\$ 626,000</b>	<b>\$ 18,818,000</b>
<b>Non-Residential</b>							
Large Existing Facilities	\$ 7,329,000	\$ 155,000	\$ 87,000	\$ 2,277,000	\$ 732,000	\$ 330,000	\$ 10,910,000
New Construction	\$ 3,547,000	\$ 75,000	\$ 25,000	\$ 1,053,000	\$ 564,000	\$ 173,000	\$ 5,437,000
Small Business	\$ 1,415,000	\$ 30,000	\$ 10,000	\$ 497,000	\$ 91,000	\$ 161,000	\$ 2,204,000
Schools	\$ 1,917,000	\$ 40,000	\$ 13,000	\$ 781,000	\$ 253,000	\$ 52,000	\$ 3,056,000
Energy Info. Services	\$ 138,000	\$ 10,000	\$ 5,000	\$ 20,000	\$ 10,000	\$ 12,000	\$ 195,000
<b>Totals for Non-Residential</b>	<b>\$14,346,000</b>	<b>\$ 310,000</b>	<b>\$ 140,000</b>	<b>\$ 4,628,000</b>	<b>\$ 1,650,000</b>	<b>\$ 728,000</b>	<b>\$ 21,802,000</b>
<b>Segment Totals</b>	<b>\$26,133,000</b>	<b>\$ 519,000</b>	<b>\$ 507,000</b>	<b>\$ 8,956,000</b>	<b>\$ 3,151,000</b>	<b>\$ 1,354,000</b>	<b>\$ 40,620,000</b>
<b>% of Cost By Category</b>	<b>64.3%</b>	<b>1.3%</b>	<b>1.2%</b>	<b>22.0%</b>	<b>7.8%</b>	<b>3.3%</b>	

<b>Program Costs</b>	<b>\$40,620,000</b>
<b>Measurement, Evaluation &amp; Research</b>	<b>\$2,300,000</b>
<b>Performance Incentive</b>	<b>\$6,987,000</b>
<b>TOTAL</b>	<b>\$49,907,000</b>

*This budget is an estimate of the spending needed to meet the 2010 energy efficiency goal for MWh savings of 320,000 MWh. If this target is not met or is exceeded, then the spending and performance incentive will vary accordingly. Additionally, even if the target is met, the cost per kWh of savings may vary from the 1.4 cents per lifetime kWh level in the above table. It is projected that a typical range of costs for these programs for 2010 is 1 to 2 cents per lifetime kWh. For these reasons, the actual spending in 2010 will vary from the point estimate provided in Table 4.*

A total of 67% of the program costs benefit customers directly in the form of incentives, training, technical assistance or education. The other 33% of program costs is earmarked for program implementation marketing, and administration expenses. These other expenses are necessary to deliver the energy efficiency programs to customers.

***A. Program Energy Savings and Benefits***

The Company has projected the estimated energy savings, costs and net benefits associated with each of the energy efficiency programs for 2010. For the analysis of net program benefits, the Company uses the most recently filed (2008) utility system avoided cost savings (including capacity value, fuel and operations/maintenance savings, and transmission and distribution savings) that will result from the expected lifetime energy savings and peak demand reductions generated by each energy efficiency program. These avoided costs are consistent with the values used in the APS PURPA 210 filed with the Commission in June 2008.

Table 5 provides details of the expected annual and lifetime energy savings and peak demand savings from each energy efficiency program and a summary of the net benefits generated for 2010. These are in addition to energy savings, costs and net benefits achieved previously from the 2005 through 2009 timeframe, which are reported in APS' 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 2010. It is anticipated that over the expected lifetime of all 2010 measures, the portfolio will produce net benefits of \$102.0 million, with a total societal benefit/cost ratio of 2.61 (societal benefits / societal costs = \$165.3 million / \$63.3 million). This means that energy efficiency measures within this plan cost 2.61 times less than the next lowest cost energy resource.

**Table 5**  
**Energy Efficiency**  
**Electric Savings Benefits <sup>1</sup>**  
**2010 Programs**

	Capacity Savings MW	Annual MWh Savings	Lifetime <sup>2</sup> MWh Savings	Societal Benefits	Societal Costs	Net Benefits
<b>Residential</b>						
Consumer Products	17.7	128,200	790,800	\$ 43,247,000	\$ 8,058,400	\$ 35,188,600
Existing Homes	8.3	10,400	138,300	\$ 12,178,400	\$ 7,782,700	\$ 4,395,700
New Construction	6.6	9,800	196,000	\$ 14,573,000	\$ 7,402,500	\$ 7,170,500
Appliance Recycling	1.5	10,100	60,600	\$ 3,337,300	\$ 1,142,000	\$ 2,195,300
Low Income <sup>3</sup>	0.2	1,500	30,000	\$ 2,063,000	\$ 2,063,000	\$ --
<b>Totals for Residential</b>	<b>34.3</b>	<b>160,000</b>	<b>1,215,700</b>	<b>\$ 75,398,700</b>	<b>\$ 26,448,600</b>	<b>\$ 48,950,100</b>
<b>Non-Residential</b>						
Large Existing Facilities	13.1	89,500	1,244,000	\$ 46,602,500	\$ 14,010,300	\$ 32,592,200
New Construction	6.9	39,200	607,000	\$ 27,685,500	\$ 7,110,700	\$ 20,574,800
Small Business	1.8	11,000	170,000	\$ 3,609,400	\$ 2,630,500	\$ 978,900
Schools	3.8	18,500	279,000	\$ 11,042,200	\$ 3,563,700	\$ 7,478,500
Energy Information System	0.2	1,800	27,000	\$ 996,300	\$ 223,800	\$ 772,500
<b>Totals for Non-Residential</b>	<b>25.8</b>	<b>160,000</b>	<b>2,327,000</b>	<b>\$ 89,935,900</b>	<b>\$ 27,539,000</b>	<b>\$ 62,396,900</b>
<b>Subtotal</b>	<b>60.0</b>	<b>320,000</b>	<b>3,542,700</b>	<b>\$ 165,334,600</b>	<b>\$ 53,987,600</b>	<b>\$ 111,347,000</b>
Measurement, Evaluation & Research					\$ 2,300,000	\$ (2,300,000)
Performance Incentive					\$ 6,987,000	\$ (6,987,000)
<b>Total</b>	<b>60.0</b>	<b>320,000</b>	<b>3,542,700</b>	<b>\$ 165,334,600</b>	<b>\$ 63,274,600</b>	<b>\$ 102,060,000</b>
<p>1. All saving values are net of free riders and include system line losses.</p> <p>2. Refers to savings over the expected lifetime of all program measures.</p> <p>3. Program costs include weatherization and bill assistance. Societal Costs do not include bill assistance because it does not contribute to electric savings. Consistent with ACC Staff's analysis in Decision No. 68647, the societal benefits are equal to the societal costs.</p>						

## VIII. Environmental Benefits

Table 6 shows the expected savings in water consumption and air emissions that will result from energy saved by the proposed portfolio of energy efficiency programs over the lifetime of the installed measures.

Consistent with the ACC Staff’s proposed draft DSM Rule R14-2-1704, the Company has made a “good faith effort” to quantify the physical units of air emissions and water savings that occur as a result of DSM energy efficiency.

In calculating these environmental benefits, APS believes that the most appropriate values to associate with energy efficiency measures are those from the newest combined cycle plants. These natural gas fired plants represent APS’s last significant dispatch group and a large portion of the market for power purchased by APS. Any load reduction due to energy efficiency measures will most likely displace generation from this type of plant.

The values proposed represent average emissions from Pinnacle West/APS’ newer combined cycle generating units. These values are meant to reasonably approximate newer combined cycle plants and the air emissions and water consumption savings that may be avoided through energy efficiency measures. APS did not conduct a detailed study of energy efficiency measures, power supply or regional emissions for purposes of developing these emissions values. APS’s approach is based on general experience related to power dispatch, reported emissions, the current electricity market, and energy-efficiency measures. APS believes this approach is a reasonable and cost-effective method of addressing environmental externalities associated with energy efficiency.

The values used to calculate the energy efficiency Environmental Benefits are as follows:

SO <sub>x</sub>	0.0043 lbs/MWh
NO <sub>x</sub>	0.172 lbs/MWh
CO <sub>2</sub>	917 lbs/MWh
PM <sub>10</sub>	0.0237 lbs/MWh
Water	233 gallons/MWh (utility water savings only)

**Table 6**  
**Energy Efficiency Environmental Benefits**  
**2010 Programs**

	<b>Water Mil Gal</b>	<b>SOx Lbs</b>	<b>NOx Lbs</b>	<b>CO2 Mil Lbs</b>	<b>PM10 Lbs</b>
<b>Residential</b>					
Consumer Products	184	3,400	136,018	725	18,742
Existing Homes	32	595	23,788	127	3,278
New Construction	46	843	33,712	180	4,645
Appliance Recycling	14	261	10,423	56	1,436
Low Income	7	129	5,160	28	711
<b>Totals for Residential</b>	<b>283</b>	<b>5,228</b>	<b>209,100</b>	<b>1,115</b>	<b>28,812</b>
<b>Non-Residential</b>					
Large Existing Facilities	290	5,349	213,968	1,141	29,483
New Construction	141	2,610	104,404	557	14,386
Small Business	40	731	29,240	156	4,029
Schools	65	1,200	47,988	256	6,612
Energy Information System	6	116	4,644	25	640
<b>Totals for Non-Residential</b>	<b>542</b>	<b>10,006</b>	<b>400,244</b>	<b>2,134</b>	<b>55,150</b>
<b>Total</b>	<b>825</b>	<b>15,234</b>	<b>609,344</b>	<b>3,249</b>	<b>83,962</b>

*The environmental benefits listed above occur over the expected lifetime of energy efficiency measures installed in 2010.*

## **IX. Program Marketing and Delivery**

To maximize program cost effectiveness and customer acceptance, the overall concept for program delivery involves working within existing markets whenever possible to take advantage of natural opportunities to promote efficiency at the time that customers are making energy-related purchasing decisions. This involves working closely with key market players and contractors involved in new construction, renovations, and equipment replacement and repair opportunities. This approach is key for delivering information and incentives about efficiency at the time that these decisions are being made by customers. The objective is to capitalize on these energy efficiency opportunities, while targeting messages to help customers understand their options for improving energy efficiency and saving energy costs.

APS implements programs using a mix of both in-house and outsourced resources. This enables the Company to take advantage of outsourced experts who have implemented similar programs in other areas, while also using in-house resources where appropriate to integrate

the energy efficiency programs into a wide range of customer communications and outreach efforts. For all programs, APS retains responsibility for program administration and reporting activities.

## **X. Measurement, Evaluation, and Research**

Measurement, evaluation and research (“MER”) verifies the impact and cost effectiveness of the energy efficiency programs. As required in Decision No. 68648, APS filed MER program plans for Staff review on August 16, 2007 with the exception of EIS, which was filed on June 24, 2008. These plans are still in effect. Comprehensive MER program reports were completed for the 2005 through 2007 start-up phase of energy efficiency to review performance and impact metrics. Some program revisions and changes were made as a result of these findings. For example, the Residential HVAC program was re-designed and improved because the original program design was found to not be cost effective using the TRC benefit to cost test. Similarly, improvements were made to the Small Business program which also had an initial TRC of less than 1.0. The Small Business program now includes a direct install approach that is designed to attract more participation and improve cost effectiveness results.

Summit Blue Consulting, a nationally renowned energy consulting company, provides the energy efficiency program measurement and evaluation services. These measurement and evaluation activities include, but are not limited to:

- Performing process evaluation to indicate how well programs are working to achieve objectives; and
- Performing impact evaluation to verify that energy efficiency measures are installed as expected; measurement of savings on installed projects to monitor the actual program savings that are achieved; and research activities to refine savings and cost benefit models and identify additional opportunities for energy efficiency.

The approach for measurement and evaluation of the energy efficiency programs is to integrate data collection and tracking activities directly into the program implementation process. In fact, ACC Decision No. 69663, Docket No. E-01345A, requires APS to “use measured savings obtained from APS customers by the MER contractor beginning no later than July 1, 2007; and that the averages of actual measured usage, for both standard and upgraded equipment, should be recalculated by the MER from usage samples for each prescriptive measure based on new measurements from the field no less frequently than every two years.” APS plans to integrate the most recent MER adjustments and findings into the annual DSM report.

APS proposes to increase the MER budget from \$1.3 million annually to \$2.3 million in 2010 to account for the expansion of existing energy efficiency programs, as well as to accommodate additional MER activities for the new programs being submitted for approval in this Plan.



## **XI. Program Funding and the Performance Incentive**

Funding for the energy efficiency programs will be collected from APS customers through the DSM Adjustment Charge (“DSMAC”) in the same year in which the funds are expended, based upon the energy efficiency budget included in this Plan. This will allow APS to collect all energy efficiency program costs and the performance incentive in the year in which they are spent and earned. By March 1st of the following year, the DSMAC will be trued up to the actual energy efficiency spending for prior years. *See* the recently filed DSMAC Plan of Administration for further details on the how the DSMAC works.

Pursuant to the Agreement, the existing performance incentive for energy efficiency programs was modified to be a tiered performance incentive based on a sliding scale of a percentage of net benefits, capped at a tiered percentage of program costs. *See* the incentive schedule presented in Table 7 for details.

**Table 7  
Energy Efficiency  
Performance Incentives**

<b>Achievement to MWh Target</b>	<b>Incentive % of Net Benefits</b>	<b>Incentive Cap % of Program Cost</b>
<b>Less than 85%</b>	<b>0%</b>	<b>0%</b>
<b>85% to 95%</b>	<b>6%</b>	<b>12%</b>
<b>96% to 105%</b>	<b>7%</b>	<b>14%</b>
<b>106% to 115%</b>	<b>8%</b>	<b>16%</b>
<b>116% to 125%</b>	<b>9%</b>	<b>18%</b>
<b>Above 125%</b>	<b>10%</b>	<b>20%</b>

Table 8 shows the calculation of the performance incentive, assuming APS achieves the annual 320,000 MWh savings target at the spending levels discussed earlier within the budget section. If APS does achieve this 320,000 MWh target, the performance incentive will be 7% of net benefits, capped at 14% of program costs. The actual performance incentive will vary based on the actual net benefits achieved and the annual program expenditures. Program costs include the performance incentive for purposes of calculating the performance incentive.

The incentive earned from the previous year will be reported in the annual report and implementation plan that will be filed with the Commission by June 1st of each year. The incentive will be determined for each reporting period based on the spending and net benefits reported for that period.

**Table 8  
Performance Incentive Calculation  
2010**

	<b>Total Benefits</b>	<b>Total Costs</b>	<b>Net Benefit</b>	<b>APS Share 7%</b>
<b>Residential</b>				
Consumer Products	\$ 43,247,000	\$ 8,058,400	\$ 35,188,600	\$ 2,463,202
Existing Homes	\$ 12,178,400	\$ 7,782,700	\$ 4,395,700	\$ 307,699
New Construction	\$ 14,573,000	\$ 7,402,500	\$ 7,170,500	\$ 501,935
Appliance Recycling	\$ 3,337,300	\$ 1,142,000	\$ 2,195,300	\$ 153,671
Low Income	\$ 2,063,000	\$ 2,063,000	\$ --	\$ --
<b>Non-Residential</b>				
Existing Large	\$ 46,602,500	\$ 14,010,300	\$ 32,592,200	\$ 2,281,454
Existing Small	\$ 27,685,500	\$ 7,110,700	\$ 20,574,800	\$ 1,440,236
New Construction	\$ 3,609,400	\$ 2,630,500	\$ 978,900	\$ 68,523
Schools	\$ 11,042,200	\$ 3,563,700	\$ 7,478,500	\$ 523,495
Energy Information System	\$ 996,300	\$ 223,800	\$ 772,500	\$ 54,075
<b>Subtotal</b>	<b>\$ 165,334,600</b>	<b>\$ 53,987,600</b>	<b>\$ 111,347,000</b>	<b>\$ 7,794,290</b>
Measurement, Evaluation & Research	\$ --	\$ 2,300,000	\$ (2,300,000)	\$ (161,000)
<b>Total</b>	<b>\$ 165,334,600</b>	<b>\$ 56,287,600</b>	<b>\$ 109,047,000</b>	<b>\$ 7,633,290</b>
	<b>Annual Expenditures (excluding Performance Incentive)</b>			<b>\$ 42,920,000</b>
	<b>Maximum Performance Incentive (14%)</b>			<b>\$ 6,987,000</b>
	<b>Performance Incentive</b>			<b>\$ 6,987,000</b>
This calculation assumes APS achieves 100% of the savings target. Therefore, the performance incentive will be 7% of net benefits capped at 14% of program costs.				

Assuming APS meets 100% of the energy efficiency goal, the maximum performance incentive is 14% of the total energy efficiency program cost. By definition, these program costs include the performance incentive (see Attachment A, paragraph 45 of Decision 67744). Therefore, the performance incentive is 16.28% of the energy efficiency program cost before the performance incentive is added in.

## **XII. Demand Side Management Adjustment Charge**

The DSMAC called for under the Agreement allows for more concurrent recovery of DSM/EE program costs and incentives. Because 2010 will be a transition year from the previous DSMAC, which recovered costs on a lagged basis, the DSMAC charges for 2010 would recover both unrecovered 2009 program costs (estimated to be \$16 million after the \$10 million recovered in base rates) and the costs for the 2010 EE Plan (estimated to be \$42.7 million after the \$10 million recovered in base rates). To moderate the impact of what would otherwise be a one-time overlap in annual previous year cost recovery; APS is offering an alternative for the Commission’s consideration. In lieu of collecting all unrecovered 2009

costs in 2010, APS could spread the transition costs over three years without interest. As shown in Attachment 6, the total costs to be recovered through the DSMAC charge for 2010 would be reduced by \$10.7 approximately with corresponding increases to costs to be recovered for 2011 and 2012.

Decision No. 71104, issued June 5, 2009, authorized the projected costs from the approved Commercial and Industrial Customer Load Management Demand Response (“DR”) program to also be recovered through the DSMAC beginning in 2010.

Attachment 6 contains the schedules supporting the DSMAC proposed to become effective in March 2010 and the corresponding customer charges necessary to recover the projected energy efficiency and DR costs.

Table 9 below is a summary of the DSM program costs from 2009 and 2010 that have been used to calculate the DSMAC charge.

**TABLE 9**  
**Estimated DSM Program Costs**

	<u>2009 (2)</u>	<u>2010 (3)</u>	<u>Total</u>
Estimated EE Program Costs (1)	\$ 25,500,000	\$49,907,000	\$75,407,000
Costs Collected Through Base Rates Demand Response (DR) Program Costs	\$(10,000,000)	\$(10,000,000)	\$(20,000,000)
	\$ 503,000	\$ 2,764,500	\$ 3,267,500
TOTAL EE and DR	<u>\$ 16,003,000</u>	<u>\$ 42,671,500</u>	<u>\$ 58,674,500</u>

**NOTES:**

(1) Includes performance incentive for EE programs, but not for DR programs

(2) Based on 2009 Budget for EE and DR expenses included in program approval filing.

(3) Based on 2010 Implementation Plan for EE and projected DR expenses in program filing

## **ATTACHMENTS**

### Residential Energy Efficiency Programs – New and Revised

APS Consumer Products Program	Attachment 1
APS Residential Existing Homes Program – Home Performance with ENERGY STAR	Attachment 2
APS Residential New Construction Program	Attachment 3
APS Appliance Recycling Program	Attachment 4

### Non-Residential Energy Efficiency Programs – New and Revised

APS Non-Residential New Construction Program	Attachment 5
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### Demand-Side Management Adjustment Charge (DSMAC)

DSMAC Schedules	Attachment 6
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**APS Consumer Products Program  
High Efficiency Swimming Pool Pump Motors and Smart Timers**

**Attachment 1**

**APS Consumer Products Program  
High Efficiency Swimming Pool Pump Motors and Smart Timers**

**July 15, 2009**

APS Consumer Products Program  
High Efficiency Swimming Pool Pump Motors and Smart Timers

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Appendix 1 – Review of Existing Programs

Appendix 2 – Residential Consumer Products Program 2010 Estimated Savings

Appendix 3 – Residential Consumer Products Program 2010 Estimated Net Benefits

<p style="text-align: center;"><b>APS Consumer Products Program</b> <b>High Efficiency Swimming Pool Pump Motors and Smart Timers</b></p>
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**APS Consumer Products Program**  
**High Efficiency Swimming Pool Pump Motors and Smart Timers**

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**1. Program Concept and Description**

This element of the Consumer Products program is designed to improve the energy efficiency in residential pool operations while maintaining equivalent or better standards for pool sanitation and cleanliness. The program will promote the installation and optimal calibration of energy efficient two-speed and variable-speed pool pump motors and timers. The primary objective is to procure kilowatt hour (“kWh”) energy savings while at the same time helping to reduce kilowatt (“kW”) demand. The program also includes the following goals:

- Increase the number of retail outlets, distributors and pool builders promoting energy-efficient pool pump motors and use of pump timers
  - Educate contractors regarding the proper installation and calibration of two-speed and variable speed pumps and pump timers
  - Raise customer awareness and increase demand for high efficiency pool pump motors and timers, for either new installations or end-of-life replacement of existing systems
- 

**1.1. Measures**

- Variable speed pool pump motors
  - Two-speed pool pump motors with timer
  - Smart digital pool pump timer systems
- 

**2. Target Market**

This program element targets residential customers. Pool products distributors and pool service and maintenance companies will be used to reach the target market. Incentives for these measures will be directed to pool equipment distributors who will receive rebates for efficient pool pumps and timers and pass them on to installers and Arizona Public Service (“APS”) customers. In addition, pool installers and service technicians will be targeted through a concerted training effort to ensure proper calibration of two-speed and variable speed pumps and pump timers.

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<p>APS Consumer Products Program High Efficiency Swimming Pool Pump Motors and Smart Timers</p>
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### 3. Current Baseline Conditions

In a typical Arizona desert home with a pool, the pool pump energy use can make up a significant portion of annual energy use, with opportunities for substantial cost-effective energy savings. For example, a 1.5 horsepower pool pump motor running eight hours per day will use approximately 400 kWh a month or 4,800 kWh a year.

Currently, almost all APS residential customers with swimming pools have inefficient single speed circulation pump motors. Because some of these pools have no timers, the pumps run virtually all of the time. For homes with timers, they are typically a basic mechanical timer which does not have the functionality to automatically adjust pump run times seasonally to maximize efficiency.

There are new variable speed pool pump technologies and digital “smart” pool timers that provide opportunities for significant cost effective savings. These more efficient pool pumps and timers have yet to be widely adopted in the marketplace, although they are proven technologies. They currently are hard to find and make up an extremely small fraction of the total new pumps and timers being sold in Arizona.

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#### 3.1. Review of Existing Programs

A summary of seven other existing pool pump and timer rebate programs from other utilities across the United States is located in Appendix 1. Incentives for two-speed and variable speed pumps range from \$75 to \$200. Savings are generally less than 1,000 kWh per year per unit.

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### 4. Program Eligibility

- Customer eligibility:
  - Program participants must be in existing or new homes currently served by APS.
- Contractor and trade ally eligibility:
  - Participating pool dealers and contractors will agree to all APS program training and certification requirements.
  - Contractors and participating pool dealers must abide by all local, state, and federal guidelines, applicable laws, building codes, regulations, and licensing and insurance requirements.
  - Contractors and participating pool dealers must agree to allow spot check inspections by the program, utility, and/or measurement and evaluation contractors for verification purposes.
  - Contractors and participating pool dealers must agree to all conditions and payment terms for any incentive payments.



**APS Consumer Products Program**  
**High Efficiency Swimming Pool Pump Motors and Smart Timers**

**5. Program Rationale and Objectives**

The objective of this program element is to achieve cost effective energy and demand savings through the implementation of an energy-efficient pool pump motor and timer rebate program element. These measures will achieve energy savings by providing rebates for the purchase and proper installation of energy-efficient pool pumps and timers. Program measures will consist of energy-efficient two-speed and variable speed pool pumps and digital timers to be sold through pool equipment distributors, retailers, and pool maintenance and repair businesses. Pump and timer installations will be performed by program approved installers who will receive training in the proper installation of these measures to ensure maximum energy savings are achieved.

The program element will also meet the longer term objective of market transformation. The program will increase customer awareness and expand the availability of these measures through a network of qualified, experienced contractors to perform the work.

The program element is designed to overcome the key barriers in the swimming pool market. Lack of information about swimming pool energy use and the actions that will save the most energy and money, and access to qualified professionals to implement efficiency measures are currently the main barriers. The program element will work to provide this educational resource to consumers, and make it as easy as possible for them to take action.

**Table 1. Market Barriers and Program Elements**

<b>Market Barrier</b>	<b>Program Element</b>
<ul style="list-style-type: none"> <li>• Lack of information about swimming pool energy use</li> <li>• What energy-saving actions are available?</li> <li>• First cost concerns for customers</li> </ul>	<ul style="list-style-type: none"> <li>• A variety of information resources</li> <li>• Specific recommendations</li> <li>• Financial incentives and information on lifecycle savings</li> </ul>
<ul style="list-style-type: none"> <li>• Lack of experienced installers familiar with these measures</li> <li>• Hassle of finding contractors and arranging work</li> </ul>	<ul style="list-style-type: none"> <li>• Training for installers</li> <li>• List of qualified contractors that meet program standards</li> </ul>

**APS Consumer Products Program**  
**High Efficiency Swimming Pool Pump Motors and Smart Timers**

**5.1. Incentive Design**

**Table 2. Incentives Schedule**

<b>Measure</b>	<b>Incentive Amount</b>	<b>Incentive as Percent of Incremental Cost</b>	<b>Requirements</b>
Variable speed pool pump motor and timer	\$270*	42%	Training and calibration
Two speed pool pump motor and timer	\$110**	48%	Training and calibration
Pool pump motor digital smart timer	\$75	38%	Training

\*Incentive amount includes \$200 distributor incentive that is passed on to the customer, \$50 contractor incentive for the proper calibration of the pool pump motor and \$20 document filing incentive.

\*\*Incentive amount includes \$100 distributor incentive and \$10 document filing incentive.

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**5.2. Tie in with Existing Programs**

APS proposes that these new measures should become a part of the suite of measures in the APS Residential Consumer Products Program.

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**6. Delivery Strategy and Administration**

APS will use a program implementation contractor to deliver this program element. The program will be implemented by providing incentives directly to distributors, making the cost of highly efficient pumps more competitive with conventional pumps. Additionally, APS's implementation contractor will organize and deliver training sessions for pool pump installers and distributors; these will begin immediately upon program launch. The trainings are required to ensure that installers properly calibrate the variable/dual speed pumps to achieve the maximum energy savings. By design, these trainings can be held at various distributor and retailer locations or at a space provided by the utility. These sessions are an integral part of this program element and will be required to officially designate an installer and distributor as a "program approved" partner.

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**6.1. Contractor Training and Certification**

APS's implementation contractor shall employ program field coordinators to serve as the program's main points of contact with all program partners. These field coordinators shall be responsible for program education and support of installer training classes.

- 1) Program field staff shall conduct training presentations at all participating outlets in the utility's territory throughout the year. These will be designed to educate distributors and installers on correct installation and calibration of two-speed and variable speed pumps and timers.

<p style="text-align: center;"><b>APS Consumer Products Program</b> <b>High Efficiency Swimming Pool Pump Motors and Smart Timers</b></p>
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- 2) The implementation contractor shall monitor distributor qualifying product levels at participating sales channels. Program field staff will visit each participating distributor at regularly scheduled intervals to check product stock levels.
- 3) On each visit, the Contractor shall:
  - Talk with store staff and management about the program promotion.
  - Inventory available stock and explore ways to increase availability of efficient options.

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## **6.2. Rebate Processing**

Rebate processing will be handled by the outsourced program implementation contractor.

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## **7. Marketing and Communications**

The marketing and communications strategy will include the following components:

- Promotions on the APS website and bill inserts;
  - Identification of this opportunity when responding to high bill inquiries;
  - APS online audits;
  - Trade ally marketing efforts;
  - Assistance with responding to customer inquiries about the program; and
  - Contractor enrollment and training.
- 

## **8. Program Implementation Schedule**

This program element will be initiated immediately upon approval. Assumptions about program participation and savings are based on receiving program approval from the Arizona Corporation Commission prior to January 1, 2010.

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## **9. Monitoring and Evaluation Plan**

Education in proper installation and calibration of pumps and timers is essential to realize estimated savings in this program. Therefore, all trade allies will receive training prior to being able to participate in the program. APS will perform site inspections for the first five jobs completed by all trade allies. Assuming the quality of the work in these initial five jobs is appropriate, the program will strive to inspect at least 5% of jobs annually per year for each trade ally. Inspections will be conducted by APS or its designated third-party entity. Additionally, as part of the APS Demand Side Management program requirements, the APS Measurement and Verification (“M&V”) contractor, Summit Blue Consulting, will also be conducting M&V activities and quality assurance for this

<b>APS Consumer Products Program</b> <b>High Efficiency Swimming Pool Pump Motors and Smart Timers</b>
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program; the M&V will include both process evaluation and program impact evaluation studies.

The quality assurance process begins with the program implementation contractor. The implementation contractor is responsible for providing training and mentoring to the contractors, documenting contractor deficiencies, tracking homeowner complaints, issuing corrective action and providing constructive feedback to ensure program quality.

If pool installation contractors repeatedly fail to provide high quality and satisfactory services to APS customers, they will be removed from the eligible contractor list. The contractors will need to apply again for re-instatement, demonstrating their commitment to quality and customer satisfaction.

## 10. Program Costs

**Table 3. 2010 Program Budget**

Year: 2010	Var. Speed Pump Motors	Two-Speed Pump Motors	Smart Timers	Total
Total Budget	\$855,000	\$47,000	\$212,000	\$1,114,000
Incentives	\$486,000	\$22,000	\$113,000	\$621,000
Program Delivery (all non-incentive costs)	\$369,000	\$25,000	\$99,000	\$493,000
Incentives as % of Budget	57%	47%	53%	56%

## 11. Estimated Energy Savings

Total annual individual measure and overall participation goals and demand and energy savings are presented in Table 4 and Table 5.

**Table 4. 2010 Estimated Energy Savings per Unit**

Measure	Net Annual kWh Savings per Unit w/Losses	Net Coin. kW Savings per Unit w/Losses
Variable Speed Motors	1,962	0.267
Two Speed Motors	1,041	0.141
Smart Timers	1,083	0.150

**Table 5. 2010 Estimated Total Annual Energy and Demand Savings**

Year	Var. Speed Motors	Two Speed Motors	Smart Timers	Total
Number of expected participants	1,800	200	1,500	3,500
Net Coincident peak (MW)	0.481	0.028	0.225	0.734
Annual Net Energy Savings (MWh)	3,532	208	1,625	5,365

<p><b>APS Consumer Products Program</b>  <b>High Efficiency Swimming Pool Pump Motors and Smart Timers</b></p>
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**12. Program Cost Effectiveness**

The cost effectiveness of each measure was assessed using the Total Resource Cost (“TRC”) test and the Societal Cost (“SC”) test.

The cost effectiveness analysis requires estimation of the following metrics:

- Net demand and energy savings attributable to the program;
- Net incremental cost to the customer of purchasing qualifying equipment APS program administration costs; and
- The present value of program benefits, including APS avoided costs over the life of the measures.

Table 6 provides a summary of the anticipated benefit/cost analysis results for this program element. Additional detailed benefit/cost analysis is presented in Appendix 3.

**Table 6. Benefit-Cost Analysis Results**

Cost Effectiveness Tests (Benefit/Cost Ratio)	TRC	SC
Variable Speed Motors	1.3	1.5
Two-Speed Motors	1.6	1.9
Smart timers	2.2	2.6

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Table 7.

**Table 7. Other Financial Assumptions**

	Variable Speed Motors	Two Speed Motors	Smart Timers
Measure Life (yrs):	10	10	10
Program Life (yrs):	5	5	5
Non-Incentive Cost (\$/unit)	\$205	\$123	\$66
TRC Discount Rate	8.42%	8.42%	8.42%
Social Discount Rate	5%	5%	5%
NTG Ratio:	90%	90%	100%

APS Consumer Products Program  
High Efficiency Swimming Pool Pump Motors and Smart Timers

**Appendix 1 – Review of Existing Programs**

Program	Incentive (\$/unit)	Qualifying Criteria	Application Process	Eligible Units	Contact
<a href="#">PG&amp;E</a>	\$100	Two-speed or variable speed; in ground pools only; units must be ≤ 3 hp; must have controller; SF and MF	<a href="#">Application Form</a>	<a href="#">Two Speed Pool Pump Rebates Database</a>	1800-933-9555; smarter-energy@pge.com
				<a href="#">Two-Speed Pool Pump Motors Rebates Database</a>	
				<a href="#">Controller Rebates Database</a>	
				<a href="#">Variable Speed Pool Pump Rebates Database</a> <a href="#">Variable-Speed Controller Rebates Database</a>	
<a href="#">SCE</a>	\$200	Two-speed or variable speed; must have controller; SF	<a href="#">Application Form</a>	<a href="#">Qualifying Pool Pump and Motor Model List</a>	800-736-4777; Kristina Wong; 626-633-3076; kristina.wong@sce.com
<a href="#">SDGE</a>	\$100	must have controller		<a href="#">Qualifying Pumps and Motors Product List</a>	
				<a href="#">Qualifying Controllers Product List</a>	
<a href="#">NV Energy</a>	\$200 - variable	In ground, SF	Instant rebate with participating retailers		
	\$100 - two-speed				
<a href="#">Pasadena Water &amp; Power</a>	\$200	2-speed, 4-speed or variable; in ground	<a href="#">Application Form</a>	<a href="#">Two-Speed Pool Pump Motors Rebates List</a>	(626) 744-6970
				<a href="#">Four-Speed Pool Pump Motors Rebate List</a>	
				<a href="#">Variable Speed Pool Pump Rebate List</a>	
<a href="#">Austin Energy</a>	\$200	Variable-speed; in ground		<a href="#">Qualified units</a>	(512) 974-7827
<a href="#">LIPA</a>	\$200 - variable	must have controller	<a href="#">Rebate Form</a>	<a href="#">Variable Speed Pool Pump Eligible Products List</a>	1-877-654-5472
	\$75 - two-speed			<a href="#">Two-Speed Pool Pump Eligible Products List</a>	

**APS Consumer Products Program**  
**High Efficiency Swimming Pool Pump Motors and Smart Timers**

**Appendix 2 - Residential Consumer Products Program 2010 Estimated Savings**

<b>Program</b>	<b>Measure</b>	Gross Coincident kW Savings per Unit w/ Losses	Gross Annual Energy kWh Savings per Unit w/Losses	NTG Adjustment Factor	Net Coincident kW Savings per Unit w/ Losses	Net Annual Energy kWh Savings per Unit w/Losses	# Units 2010	<b>TOTAL Net kW Savings 2010</b>	Meas. Life	<b>TOTAL Net Lifetime kWh Savings from 2010 Measures</b>	<b>TOTAL Net Annual kWh Savings 2010</b>
Res. CPP	CFLs	0.0069	50	0.78	0.0054	39	3,150,400	16,955	6	737,193,600	122,865,600
Res. CPP	Pool Pumps - Variable Speed	0.297	2,180	0.90	0.267	1,962	1,800	481	10	35,316,000	3,531,600
Res. CPP	Pool Pumps - Dual Speed	0.157	1,157	0.90	0.141	1,041	200	28	10	2,082,600	208,260
Res. CPP	Smart Pool Timers	0.15	1,083	1.00	0.150	1,083	1,500	225	10	16,245,000	1,624,500
<b>Total Res. CPP</b>							<b>3,153,900</b>	<b>17,690</b>		<b>790,837,200</b>	<b>128,229,960</b>

Where:

"Program" = Residential Consumer Products Program

"Measure" = DSM measure

"Gross Coincident kW savings per unit w/losses - Coincident kW savings/home/year before Net to Gross Adjustment. Includes capacity reserve factor.

"Gross Annual kWh savings per unit w/losses" = kWh savings/home/year before Net to Gross adjustment

"NTG Adjustment Factor" = Net to Gross Ratio = factor to account for free riders

"Net Coincident kW savings per unit w/losses - Coincident kW savings/home/year after Net to Gross Adjustment. Includes capacity reserve factor.

"Net Annual kWh savings per unit w/losses" = kWh savings/home/year after Net to Gross adjustment

"# Units 2010" = APS estimates of expected participation in each measure in 2010

"Total Net kW Savings 2010" = Total estimated demand savings in 2010

"Measure life" - Expected lifetime of the measure - based on DEER database and other national sources

"Total Net Lifetime kWh Savings" = Estimated total energy savings over the expected life of measures installed in 2010

"Total Net Annual kWh Savings" = Estimated annual energy savings in 2010

APS Consumer Products Program  
High Efficiency Swimming Pool Pump Motors and Smart Timers

**Appendix 3 - Residential Consumer Products Program 2010 Estimated Net Benefits**

Measure	Avoided Cost Savings per Unit	Net Participant Cost per Unit	PA* Costs per Unit	TRC Costs per Unit	# Units 2010	Total PA Costs 2010	Total TRC Benefits 2010	Total TRC Costs 2010	TRC Net Benefits	TRC Benefit/Cost
CFLs	\$ 12.85	\$ 1.28	\$ 0.68	\$ 1.96	3,150,400	\$2,142,272	\$40,482,640	\$ 6,174,784	\$34,307,856	6.56
Pool Pump Var. Sp.	\$ 997	\$ 585	\$ 205	\$ 790	1,800	\$ 369,000	\$ 1,794,600	\$ 1,422,000	\$ 372,600	1.26
Pool Pump Dual Sp.	\$ 529	\$ 206	\$ 123	\$ 329	200	\$ 24,600	\$ 105,800	\$ 65,820	\$ 39,980	1.61
Smart Pool Timer	\$ 576	\$ 198	\$ 66	\$ 264	1,500	\$ 99,000	\$ 864,000	\$ 395,760	\$ 468,240	2.18
<b>TOTAL</b>					<b>3,153,900</b>	<b>\$2,634,872</b>	<b>\$43,247,040</b>	<b>\$ 8,058,364</b>	<b>\$ 35,188,676</b>	<b>5.37</b>

\* "PA Costs per Unit" = Program Administrative Costs per Unit which includes all non-incentive costs



**Attachment 2**

**APS Residential Existing Homes Program  
Home Performance with ENERGY STAR®**

**July 15, 2009**

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Appendix 1 – Review of Other Programs and Best Practices

Appendix 2 - Res. Existing Homes Program 2010 Estimated Savings

Appendix 3 - Res. Existing Homes Program 2010 Net Benefits

## **APS Res. Existing Home – Home Performance with ENERGY STAR®**

### **1. Program Concept and Description**

Home Performance with ENERGY STAR, (“HPwES”), is a nationally recognized program design, sponsored by the U.S. Environmental Protection Agency (“EPA”) and the U.S. Department of Energy (“DOE”), and delivered successfully in over 20 states. HPwES builds on the significant consumer recognition of the ENERGY STAR label as a mark that designates superior energy efficiency. But HPwES is more than just a new label for existing homes programs; it is a philosophy and approach toward improving the whole house energy performance. In addition to energy savings, this holistic approach addresses comfort, health and safety issues.

- The purpose of the HPwES element of the APS Residential Existing Home Program is to produce long-term energy savings in the residential sector by assisting homeowners in identifying energy efficiency opportunities and providing incentives to make recommended energy-related home improvements.
- Customers who are owners of single family detached homes, town homes and other attached residential buildings up to four units will be invited to participate in the program through a number of marketing efforts such as home shows and events, direct mailings, bill inserts, internet, print and TV/radio advertising.
- Qualifying efficiency measures, identified in a comprehensive on-site home energy audit (also called “assessment”), are aimed at improving the building’s efficiency through improvements in the building envelope (the walls, ceilings, floors, doors and windows that separate outdoor air from indoor conditioned air) and mechanical equipment. In addition, the audit will provide direct installation of simple cost effective lighting and water measures, as well as identifying any other energy saving opportunities in the home, especially any measures where APS has current energy efficiency rebates available. Participants will also be provided with information about rate plans that promote conservation and peak demand savings.
- All audits and installations are to be done by pre-qualified contractors who are certified by the Building Performance Institute (BPI).<sup>1</sup> APS will create a list of BPI qualified contractors who have passed through a rigorous screening process to ensure quality installations and that they abide by APS program participation guidelines.
- The program element will provide building science training and support to participating trade allies with the intention of improving the quality and availability of energy efficiency contracting work being performed throughout the region.
- The program element will also implement various education and outreach strategies to raise consumer awareness of the benefits and availability of energy efficiency improvements to their homes.

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<sup>1</sup> BPI is a national training, certification and accreditation organization. They are recommended by EPA as the national certification program used to train and certify HPwES participating contractors.

<b>APS Residential Existing Homes Program Home Performance with ENERGY STAR<sup>®</sup></b>
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## **2. Target Market**

This program element is targeted to APS residential customers (primarily single family homeowners) who are considering home maintenance, repair, remodeling, or are experiencing high energy bills or comfort issues in their existing homes; essentially anyone who is looking for recommendations on how to make their home more efficient.

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## **3. Current Baseline Conditions**

### **Baseline Home Information**

As determined in a 2006 existing homes baseline study,<sup>2</sup> a typical existing home in the APS service territory includes the following characteristics:

- Home size is just over 2,100 SF with three bedrooms;
- Home age is approximately 20-25 years old;
- Home has an uninsulated slab on grade foundation;
- Construction is 2x4 wood frame with a high level of air infiltration;
- Windows are single pane with aluminum frames;
- HVAC system is forced air central air conditioning (heat pump or AC/gas pack combination units) with leaky ducts in the attic.

The energy efficiency features identified in this baseline study have a wide range of values. The average home in this survey has fairly substantial leaks with 7.1 Air Changes per Hour (“ACH”) 50 (i.e., 7.1 ACH at 50 pascals pressure.) By way of comparison, the ENERGY STAR standard for new homes is 3.0 ACH50 under the performance path. Note, however, that studies in other warm climate regions (e.g., Florida) have found average leakage as high as 12.38. The doors are fairly typical for an Arizona home with approximately 1.5 R-Value. The attic insulation is also on average fairly good for existing housing at 27.8 R-Value based on our field inspections. The wall and rim joist insulation is fairly low with approximately R-11 plus plywood sheathing. Slab insulation is essentially zero.

These characteristics appear to be comparable to other survey data and representative of typical existing homes in the APS territory.

### **Baseline HVAC Information**

The HVAC systems are fairly mixed in existing homes, with a majority of the systems using a gas furnace and a central air-conditioner, although a significant number of heat pumps are present. The systems are generally in good to excellent condition and average about 8.7 years old. Like the HVAC system, the thermostat to control the system is also fairly mixed with a large number of programmable digital, manual digital and manual analog. The duct leakage at 245.7 CFM (cubic feet per minute) at 25 pascals can be considered fairly leaky for an average size home. The duct leakage can be roughly translated to 15% leakage if you assume that a 2,100 SF home in the APS territory has

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<sup>2</sup> Arizona Public Service Energy Efficiency Baseline Study, September 11, 2006, ICF International.

## APS Residential Existing Homes Program Home Performance with ENERGY STAR®

approximately 4 tons of cooling and a 1,600 CFM HVAC system. The majority of that leakage is going directly to unconditioned spaces, as the average home has 72% of the ducts in unconditioned space, and most of the homes actually have 100% of the ducts in unconditioned spaces. The average ducts have approximately R-4 insulation, with a number of homes having R-6 insulation. These results are consistent with APS's 1996 study of homes conducted by Proctor Engineering.

It is estimated that the Phoenix metro area has approximately 60,000 HVAC units replaced annually; about half of these in the APS service territory. Many of the homes replacing HVAC units have substandard insulation, substantial air leakage, and other significant opportunities for cost effective energy savings. These data indicate that there are significant cost effective opportunities available for improving HVAC system energy efficiency in existing homes.

### **Baseline Window/Shade Screen Information**

The baseline study results show that the average window is an aluminum frame window with both 0.65 U-Value and Solar Heat Gain Coefficient ("SHGC"). These windows are on average fairly well distributed by orientation, but slightly more windows on the North and South orientations than the East and West orientations.

Window area accounts for around 15% of the total wall area for the average home, yet solar heat gain through windows typically accounts for up to 50% of air conditioner work load. Untreated windows in the desert environment allow about 20 times more heat into a home than an equal amount of insulated wall space.<sup>3</sup> This heat gain can amount to between 1,400 and 2,200 kWh per year of electricity used to cool indoor air heated by solar gain in the typical home.

There are currently thousands of older homes throughout Arizona with clear single pane windows. These windows are very inefficient, but due to the high cost of replacement windows, it is generally not cost effective to replace them. For these homes, window shade screens are an excellent measure, which produces substantial energy savings for a fraction of the cost of replacement windows.

However, shade screens are a common measure in Arizona. Many homes already incorporate shade screens or some other shading devices, and this measure is commonly implemented without the need for a rebate. In addition, shade screens installed in the wrong locations (north facing exposures, under partial overhangs, on top of low E energy efficient window glass) only produce a fraction of the expected savings. As a result, a stand-alone shade screen program could have a high level of free riders (i.e., customers who would have purchased the shade screens in the absence of a rebate) and instances where screens were installed in suboptimal locations; which would contribute to a lower average actual savings due to installation issues. Incorporating this measure into a comprehensive Home Performance energy audit, however, ensures that the incentives are applied only in the situations which will be cost effective. APS will evaluate the measure

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<sup>3</sup> APS FAQ "Energy Answers" 1999.

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in 2010 to consider approaches for incorporating it as a potential stand-alone measure in the future.

### **Baseline Water Fixture Information**

#### Showerhead

In a typical Arizona residence, the baseline for a showerhead is assumed to be 4.0 gallons per minute (“GPM”).<sup>4</sup> As part of the on-site audit, auditors will identify high-flow showerheads that have a flow rate of approximately 4.0 GPM or more and replace it with a 1.5 GPM low-flow showerhead upon customer approval. Replacing a 4.0 GPM with a 1.5 GPM saves approximately 2,800 gallons of water per year in shower water consumption.<sup>5</sup> This also saves an estimated 240 net kWhs of energy used to heat water.

#### Faucet Aerator

In a typical Arizona residence, the baseline for faucet aerators is assumed to be 2.2 GPM.<sup>6</sup> Replacing a 2.2 GPM aerator with a 1.0 GPM aerator saves approximately 2,500 gallons of water per year in a kitchen sink, and 1,400 gallons per year in a bathroom sink. This replacement saves an estimated 80 net kWhs of energy used to heat water.

### **DOE Home Performance Research Grant**

In 2008, APS in partnership with the Arizona Department of Commerce Energy Office and a consortium of all the major utilities in Arizona received a \$500,000 grant from the United States Department of Energy to conduct a housing characterization study in five major cities in Arizona (Phoenix, Tucson, Prescott, Flagstaff, and Kingman). This ongoing research is conducting home performance testing and repairs on a representative sample of homes in each city to identify approaches for streamlining the on-site audit process. The objective is to focus resources on measures that will achieve the most cost effective savings. The preliminary results of this project have been used to inform the proposed program design, and as the research progresses APS intends to utilize findings to optimize delivery of program measures.

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## **4. Program Eligibility**

- Customer eligibility –
  - Program participants must be in existing residential homes currently served by APS.
- Contractor eligibility –
  - Contractors must obtain appropriate BPI certification in the respective work areas to be completed in the home (shell, HVAC, etc.).
  - All contractors must sign a program participation agreement which acknowledges their adherence to all program policies and procedures.
  - Contractors must be licensed, bonded and insured.

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<sup>4</sup> "Potential Water and Energy Savings from Showerheads" 2006, Biermayer, Pg. 7.

<sup>5</sup> Water consumption is sourced from "Residential End Uses of Water" published by American Water Works Association, 1999, which estimates the gallons per capita per day.

<sup>6</sup> Labeled as a "traditional" faucet per WaterSense ([http://www.epa.gov/WaterSense/pubs/faucet\\_fa.htm](http://www.epa.gov/WaterSense/pubs/faucet_fa.htm)).

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- Contractors shall abide by all local, state and federal guidelines, applicable laws, building codes, regulations and licensing requirements.
- Contractors agree to allow spot check inspections by the program, utility, and/or measurement and evaluation contractors for verification purposes.
- Contractors agree to satisfy all ongoing training and certification requirements of the program.
- Contractors agree to all conditions of payment and payment terms.

**5. Program Objective and Rationale**

The objective of this program element is to produce long term electric savings in the residential sector by assisting participants in identifying energy efficiency opportunities and providing incentives to make recommended energy-related home improvements. In addition, the program element seeks to transform the existing homes residential market to one where consumers understand and value: 1) the advantages that an energy efficient home provides; 2) the numerous energy efficient product choices; and 3) the wealth of knowledgeable, experienced contractors available to perform the work. The program will also meet the longer term objective of market transformation by increasing customer awareness concurrently with expanding the network of qualified, experienced contractors to perform energy efficiency retrofit work.

The HPwES program element is designed to overcome the key barriers in the residential existing homes market – lack of information about how the home uses energy and the actions that will save the most, as well as access to qualified professionals to help implement efficiency measures. The program will work to provide this educational resource to consumers and make it as easy as possible for them to take action by developing a sustainable market-based infrastructure of experienced energy professionals who can assist with the major renovation work necessary to capture the significant savings potential in the existing homes market.

**Table 1. Market Barriers and Program Elements**

<b>Market Barrier</b>	<b>Program Element</b>
<ul style="list-style-type: none"> <li>● Lack of information about home energy use and which energy-saving actions to take first</li> <li>● First cost concerns for customers</li> </ul>	<ul style="list-style-type: none"> <li>● A variety of energy analysis tools and services that provide prioritized recommendations</li> <li>● Financial incentives and information on lifecycle savings</li> </ul>
<ul style="list-style-type: none"> <li>● Lack of experienced contractors to address more complex home performance issues</li> <li>● Difficulty of finding qualified contractors and arranging work</li> </ul>	<ul style="list-style-type: none"> <li>● Training and mentoring for providers</li> <li>● List of qualified contractors that meet program standards</li> </ul>

## APS Residential Existing Homes Program Home Performance with ENERGY STAR®

### **Cost Effectiveness of Established HPwES programs**

As of February 2008, Home Performance with ENERGY STAR programs are being implemented in 21 states. Mature Home Performance with ENERGY STAR programs achieve an estimated levelized Cost of Conserved Energy (“CCE”) of 0.05 \$/kWh. The New York State Energy Research and Development Authority (“NYSERDA”) was an early adopter, starting an HPwES program in 2001. Since that time, their program has improved the energy efficiency of more than 11,000 homes.

Cost effectiveness evaluations show the following:

- Total Resource Cost (“TRC”) test results for HPwES in 2005 = 1.4

Wisconsin Focus on Energy, also an early adopter, estimates annual savings of 1,100 kWh per home after working on more than 6,000 homes. Austin Energy, another early adopter, shows savings on average of 1,515 kWh<sup>7</sup> per participating household. While all these programs have become successful, it is important to note that to train contractors to the highest standards of building science and to educate the public that it is a worthy investment to hire trained and credentialed contractors takes time. The development of successful energy efficiency programs for existing homes requires long maturation times with considerable investment in support services leading to long term market transformation.

### **Program Strategy**

The HPwES program element is structured to meet an aggressive first year goal of 1,000 audits in 2010 (as specified in the APS Settlement Agreement). The proposed program design is as follows:

- Home energy audits will be offered at a substantial discount to customers. The proposed audit cost to the customer is \$99/home as compared to the current market cost of approximately \$400 per audit. APS proposes to pay \$200 per completed audit to the BPI Certified contractor who conducts the audit upon completion of all required reports for a given job.
- All home energy audits will include a diagnostic test to identify the air tightness of the home’s duct system and building envelope.
- To encourage energy efficiency repair work, incentives will be provided for blower door guided air sealing of the home’s ducts and thermal envelope – these are two of the most cost effective opportunities for savings in typical Arizona homes. Additional thermal envelope measures that will be promoted through the program where appropriate and cost effective will include attic insulation and window shade screens.
- It is essential to the success of this program element to develop a resource of experienced energy efficiency professionals who can provide audit/testing services and complete home repair work. To achieve this objective, trade ally

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<sup>7</sup> Home Performance with ENERGY STAR: Utility Bill Analysis on Homes Participating in Austin Energy’s Program, for the period 1998 through 2006. Published July 2007, National Renewable Energy Laboratory



## APS Residential Existing Homes Program Home Performance with ENERGY STAR®

- recruitment and training will go on throughout the implementation of the program.
- In this program, consumer education is particularly important to help homeowners understand the unseen components of their home such as ductwork that can be creating energy waste and comfort problems. Customer education and marketing will go on throughout the implementation of the program including promotion of the online energy analyzer home energy audit to help in screening potential participants for the HPwES program.

During the audit, in addition to reviewing savings opportunities, the contractor will direct install up to ten compact fluorescent lamps per home in high-use locations ( $\geq$  three hours/day use), up to three low flow faucet aerators, and up to one low flow showerhead with an automatic shut off valve to garner immediate energy savings. The direct install CFLs will be typical 14 watt twist bulbs as well as covered reflector bulbs to be used in recessed can light applications. These bulbs will save an average of 75% of energy use compared to standard incandescent bulbs. The direct install low flow showerheads will be rated to use 1.5 GPM, providing a comparable shower while saving at least 1.0 GPM in hot water use compared to current code fixtures and more than 5.0 GPM compared to older showerheads. They also include a special valve that automatically shuts off water flow when the proper temperature is reached to save hot water normally wasted while waiting for showers to warm up. The direct install faucet aerators will be rated to use 1.0 GPM, providing comparable service while saving up to 5.0 GPM in water use compared to older fixtures.

If the assessment finds no health and safety issues, and if the assessment also finds that air-sealing would be an effective energy efficiency measure, the assessor will recommend additional services. The assessment will also include recommendations for all other appropriate energy efficiency improvements relevant to the home. Contractors will be trained to educate homeowners about the benefits of each potential energy efficiency improvement. The Program will actively recruit, train and qualify contractors specializing in delivering air sealing services and/or comprehensive whole house energy efficiency services as needed to meet demand. This workforce development will support “green collar” job opportunities in Arizona.

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### **6. Delivery Strategy and Administration**

APS will serve as the program administrator for the Home Performance with ENERGY STAR program. APS will provide program marketing, planning, participant tracking, technical support and evaluation. The Foundation for Senior Living Home Improvements Inc. (“FSL”), a non-profit organization founded with the goal of improving existing housing stock in Arizona, will assist APS with program implementation.

FSL Home Improvements is a 501c3 non-profit organization affiliated with the Foundation for Senior Living in Phoenix, Arizona. Since 1975, the Foundation for Senior Living and its affiliates have been providing quality social services to the Phoenix metropolitan community. In 1987, FSL launched the Home Improvements program,

<b>APS Residential Existing Homes Program Home Performance with ENERGY STAR®</b>
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which was designed to increase an individual's ability to remain living in a residential based environment. Research shows that many elderly and disabled adults are living in an unsafe home which can increase their risk of falls and illness ultimately leading to premature institutionalization. In addition to unsafe housing conditions, high energy bills often force this population to sacrifice medical care in place of paying electrical bills in the blistering Phoenix summer heat. FSL's involvement in the energy efficiency and retrofit market originated out of the need to help low-income seniors who struggled with increasing energy bills.

Today, FSL is a leader in the weatherization industry and continues its commitment to promoting and facilitating the whole-house approach to energy improvements for homeowners of all social classes. FSL Home Improvements has been actively involved with the low income weatherization program for many years, and they operate the Southwest Building Science Training Center, which is the accredited provider of BPI contractor training in Arizona. The organization is nationally recognized for its work in training and certifying building contractors in energy efficiency and building science.

Because of their experience with low income weatherization and link to the BPI training and certification process, FSL is uniquely positioned to assist in this program. FSL is currently listed with the EPA as the Arizona Home Performance with ENERGY STAR partner. This structure was developed to allow FSL to implement the program throughout the state, within the APS territory and potentially for other utilities. FSL will provide overall program management to include lead generation, contractor recruitment, training and BPI certifications for contractors, quality assurance, inspections and oversight, as well as assisting APS in program promotion and marketing. The actual direct delivery of efficiency services to residential customers will be by participating trade allies who are APS approved and certified as BPI contractors. These BPI contractors will be responsible for conducting the Home Performance audits and making necessary improvements to the home.

### **Program Implementation**

Inquiring consumers will receive information about the Home Performance with ENERGY STAR program and a free referral to qualified HPwES contractors whom they can contact for a comprehensive whole house assessment. All referral information will be tracked by the program implementer to ensure timely reporting by the contractors as well as to monitor client satisfaction. Once a contractor receives the call, it is up to them to manage the lead, perform the assessment, complete the job, and report back to the program sponsors FSL and APS.

Home Performance audits will include a comprehensive home assessment with the following features/components:

- Diagnostic home performance test (with blower door/duct blaster tests performed) to assess the air tightness of the building envelope and duct system. This will indicate if the home is a candidate for cost effective energy savings from duct sealing and whole house air sealing.

**APS Residential Existing Homes Program  
Home Performance with ENERGY STAR®**

- Visual inspection to identify other potential opportunities for cost effective energy savings including insulation, appliances, window shade screens, pool pump measures, etc.
- Direct installation of some cost effective measures (subject to customer approval) as appropriate for each home, up to a maximum of ten CFLs, one low flow showerhead with a shut off valve and up to three low flow faucet aerators per home. This ensures that each assessment produces verified savings, even in cases where homeowners do not opt to complete other recommended measures.
- BPI minimum health and safety requirements.
  - Combustion safety and carbon monoxide testing.
- Summary report including recommendations for cost effective efficiency measures identified in the audit as well as a comprehensive proposal for completing all recommended measures and identification of other measures that may be suitable candidates for other APS efficiency programs such as:
  - Primary or secondary refrigerator replacement;
  - High efficiency swimming pool pump motor and timer measures; and
  - HVAC replacement.
- Customer information about APS rebates and discounts on energy efficient products and services, APS rate options and other resources.

Program staff will be available to answer any questions that may arise and to provide support to the customer as needed throughout the process.

**Incentive Design**

Customer Incentives

**Table 2. Customer Incentives Schedule**

<b>Measure</b>	<b>Customer Incentives</b>	<b>Requirements</b>
Audit – Comprehensive Home Assessment	Audit price discounted to \$99. (Standard price is approx. \$400)	Customer pays contractor directly for the discounted cost only.
CFLs – direct install	Up to 10 bulbs provided at no cost to customer	Installed at time of audit
Water measures – direct install	No cost to customer for: <ul style="list-style-type: none"> <li>• Faucet aerators in the kitchen and up to 2 baths</li> <li>• 1 low flow shower head including automatic shut-off valve</li> </ul>	Installed at time of audit with old one left on the counter
Duct sealing	75% of the job cost up to a maximum rebate of \$250.	Contractor performs duct sealing work, provides all materials and testing in/out to document savings
Air sealing	75% of the job cost up to a maximum rebate of \$250.	Contractor performs air sealing work, provides all materials and testing in/out to document savings
Insulation with Air Sealing	75% of job cost up to \$500 to increase insulation level to R-30	<ul style="list-style-type: none"> <li>• Must implement air sealing first</li> </ul>

**APS Residential Existing Homes Program  
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Measure	Customer Incentives	Requirements
		<ul style="list-style-type: none"> <li>Only available if existing R-value is less than R-19</li> </ul>
Shade Screens	\$1 per square foot, up to a maximum rebate of \$250	<ul style="list-style-type: none"> <li>Eligible only for the South, West, and East side of house</li> <li>Must be minimum shading coefficient of 0.80 to reduce solar heat gain by at least 80%</li> </ul>

Customer Financing

- APS will work with a third-party financing provider who will offer financing on a comprehensive set of measures recommended through the HPwES assessment.
- The financing arrangements will be completed between the customer, contractor and third party financing provider. APS will not be directly involved in the financing.
- The program will seek to offer customers attractive terms and rates for the financing, with potential options including secured or unsecured financing packages.
- Customers will be able to use their APS rebate dollars to directly buy down the finance rate if they choose.

Contractor Incentives

The Program offers incentives to participating contractors for training and to help subsidize the cost of comprehensive audit services for participating customers.

APS will pay 50% of the total cost for Building Analyst training and any related training needed to certify contractors for performing HPwES audits. APS only pays the subsidy after confirmation from BPI that the student passed the class.

Incentives to contractors for completed assessments are contingent upon FSL and APS receiving all project documentation from the contractor. The incentive structure is presented below.

**Table 3. HPwES Contractor Incentives**

Efficiency Measure	Contractor Incentives	Requirements
Audit, Direct Install of CFLs and Water Measures	\$200 incentive to HPwES contractor provided upon submission of all completed job documentation.	Contractor does initial assessment, completes direct install measures, and reports job to the program

**Tie in with Existing Programs**

This program will be used to deliver all other applicable residential measures/rebates by identifying all cost effective opportunities in the assessment.

<p>APS Residential Existing Homes Program Home Performance with ENERGY STAR®</p>
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**Contractor Training and Certification**

APS is well positioned to achieve the aggressive first year goals for this program, since APS has been actively working with contractors to develop a market based resource for home performance testing and energy audit services for over a decade. In fact, FSL is currently implementing a very small scale pilot HPwES program with assistance from APS as a part of the Res. Existing Home Program.

The program will initially recruit local contractors with existing BPI certified technicians and Home Energy Rating System (“HERS”) certifications, encouraging them to become HPwES designated contractors. By virtue of securing these certifications, these organizations have made a commitment to energy efficiency and are the best candidates for recruitment. Partnering with these contractors will ensure an immediate launch of the program in the targeted community. An extensive marketing campaign will be implemented to recruit contractors capitalizing on existing resources such as the Arizona Heat Pump Council and other specialty associations to spread the word. FSL will administer and APS will help to pay for BPI training, reimbursable after they have received BPI certification. Currently, there are more than 60 BPI certified technicians in the state of Arizona and several more contractors are in the process of obtaining certification.

FSL and APS will provide an orientation to the HPwES Arizona program which will outline program requirements and contractors responsibilities as well as discuss reporting and data collection procedures. Contractors interested in participating in the program must attend the orientation as well as meet all program requirements for training, technician certification, and program mentoring.

The quality assurance process begins with the program sponsor (FSL Home Improvements) who is responsible for providing training and mentoring to all participating contractor(s). The sponsor provides the leads to the contractor(s) who are responsible for performing home evaluations, making recommendations, performing test-out and reporting results back to the program sponsor. The sponsor then reviews the documents, mails the homeowner a survey and performs random sampling and field inspections of work completed. The program sponsor also documents contractor deficiencies, tracks homeowner complaints, issues corrective action, and provides constructive feedback to ensure program quality.

After successful completion of the BPI training class and certification exam, new contractors wishing to join the program will be enrolled in a “mentor” phase for their first several audits. The contractor will receive a ride- a-long for their first three jobs. At that time, the mentor will complete a contractor assessment to determine if they are ready to start conducting audits on their own. If so, they will exit the mentoring phase, but they will have the next five jobs they complete inspected. If the mentor determines that they are not yet ready to start conducting audits, they will recommend up to three more ride-a-longs, with a fee to cover the ride-a-longs’ cost being paid by the contractor. If they are still not ready to deliver audits after these additional ride-a-longs, the contractor will be placed on hold for six months before they will be able to reapply for participation in the program.

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Participating contractors must employ properly trained staff, and must allow inspection of work performed by the Program to ensure that all measures are properly installed and safety precautions are observed. Only contractor firms with BPI certified technicians on staff may participate in the Program. This accreditation requirement provides assurance to customers and the Program that comprehensive savings have been assessed, and that any health and safety considerations are also included in the report of recommended actions. Participating contractors must guarantee all work, and participating contractor companies must agree to abide by BPI standards governing health and safety, work quality, insurance coverage, customer service, and complaint resolution.

### **Trade Ally Management**

All participating contractors will be posted on the HPwES website. All program participation guidelines will also be available on the website.

### **Rebate Processing**

Rebate processing will be conducted by an outsourced program implementation contractor. Rebate application forms will be available for printing online at [aps.com](http://aps.com). Applications must be submitted by mail, along with supporting documentation and proof of a paid invoices for all work conducted. All applications received will go through a quality control process to review for completeness, accuracy and consistency of data. In some cases, where questions are identified, processing staff will call the customer or installing contractor for verification. In addition, random inspections will be conducted on at least 10% of all jobs to field-verify proper installation of all measures as indicated on the rebate application form(s).

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## **7. Marketing and Communications**

The marketing and communications strategy will include the following components:

- Promotions on the APS website;
  - APS bill inserts;
  - Advertising in major newspapers and other selected print media in the APS service region to raise awareness of the availability of the program;
  - Developing marketing pieces including brochures and other collateral pieces such as bill inserts;
  - High bill inquiries;
  - APS online energy audit - recommend on-site audits if customers want to go further in analysis;
  - Trade ally marketing efforts;
  - Assistance with responding to customer inquiries about the program; and
  - Contractor enrollment and training.
-

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**8. Program Implementation Schedule**

This program element will be initiated immediately upon approval by the Arizona Corporation Commission (“Commission”) with the goal of achieving 1,000 audits by the end of 2010. Assumptions about program participation and savings are based on receiving program approval from the Commission prior to Jan 1, 2010.

**9. Monitoring and Evaluation Plan**

On an ongoing basis, as part of their role as the EPA program sponsor, FSL is responsible for conducting random on-site inspections on at least 10% of all jobs performed. These inspections will be conducted by experienced and well trained FSL field staff. Additionally, as part of the APS DSM program requirements, the APS Measurement, Evaluation and Research contractor (Summit Blue Consulting) will also be conducting program measurement and verification activities and quality assurance for this program, including process evaluation and program impact evaluation studies. Finally, to ensure customer satisfaction, homeowner surveys will be sent to all program participants who receive an audit.

**10. Program Costs**

The annual budget for the HPwES program element is based on a goal of completing at least 1,000 home assessments in 2010. For more information on expected participation in each individual measure of the program, see Table 5 in Section 11 of this document.

**Table 4. 2010 HPwES Budget**

Year 2010	Air Sealing	Attic Insulation and Sealing	Duct Repair (As part of HPwES)	Shade Screens	Direct Install LF Shower Heads	Direct Install LF Aerators	Direct Install CFLs	Home Audit Contractor Incentives
Total Budget	\$373,000	\$322,000	\$228,000	\$147,000	\$53,700	\$18,900	\$16,000	\$200,000
Incentives	\$125,000	\$125,000	\$100,000	\$50,000	\$31,200	\$11,400	\$16,000	\$200,000
Program Delivery (all non-incentive costs)	\$248,000	\$197,000	\$128,000	\$97,000	\$22,500	\$7,500	\$0	\$0
Incentives as % of Budget	34%	39%	44%	34%	58%	60%	100%	100%

**11. Estimated Energy Savings**

This program bundles a number of measures to provide opportunities for integrated comprehensive energy efficiency upgrades that are customized according to the needs of each participating household. As such, the particular mix of measures will differ for each home. Analysis based on estimated participation rates for all measures in the HPwES program indicates estimated savings for the average HPwES program participant to be 2,551 kWh/year. The savings shown are net (meaning adjusted for free-ridership) and

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adjusted for line losses. The table below shows the expected participation rates and net savings broken down by measure to show how this average savings is calculated.

**Table 5. 2010 HPwES Estimated Energy Savings per Home**

	# of Homes	Weighting Factor (%)	Net. Coin. kW Savings w/ Losses (kW/yr)	Net kWh Savings w/ Losses (kWh/yr)
<b>Air/Sealing Attic Insulation</b>				
None	250	25%	0	0
Air Sealing Only	500	50%	0.814	1,500
Air Sealing Plus Attic Insulation	250	25%	0.977	2,064
<i>Weighted Average</i>	1,000	100%	<b>0.651</b>	<b>1,266</b>
<b>Duct Test and Repair (in HPwES Program)</b>				
None	600	60%	0	0
DT&R	400	40%	1.826	1,289
<i>Weighted Average</i>	1,000	100%	<b>0.730</b>	<b>515</b>
<b>Shade Screens</b>				
None	800	80%	0	0
Shade Screens	200	20%	1.186	1,679
<i>Weighted Average</i>	1,000	100%	<b>0.237</b>	<b>336</b>
<b>Direct Install Showerheads</b>				
None	400	40%	0	0
Low Flow Shower Head w Shower Start	600	60%	0.023	240
<i>Weighted Average</i>	1,000	100%	<b>0.014</b>	<b>144</b>
<b>Direct Install Faucet Aerators</b>				
None	1,500	50%	0	0
Low Flow Aerators	1,500	50%	0.0130	80
<i>Weighted Average</i>	3,000	100%	<b>0.007</b>	<b>40</b>
<b>Direct Install CFLs</b>				
None	200	20%	0	0
CFLs (Avg. 8 per home)	800	80%	0.040	312
<i>Weighted Average</i>	1,000	100%	<b>0.032</b>	<b>250</b>
<b>CUSTOMER AVERAGE</b>			<b>1.671</b>	<b>2,551</b>

## 12. Program Cost Effectiveness

The cost effectiveness of each measure and each program as a whole was assessed using the TRC test and the SC test (the SC test analysis uses a lower societal discount rate than the TRC analysis).



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The cost effectiveness analysis requires estimation of:

- Net demand and energy savings attributable to the program;
- Net incremental cost to the customer of purchasing qualifying equipment, and of conducting quality installation and test and repair activities;
- APS's program administration costs; and
- The present value of program benefits including APS avoided costs over the life of the measures.

Table 6 provides a summary of the benefit/cost analysis results for measures in this program. For more information, see Appendix 3.

**Table 6. Benefit-Cost Analysis Results**

Cost Effectiveness Tests Benefit/Cost Ratio	TRC	SC
Air Sealing	1.4	1.7
Attic Insulation and Sealing	1.3	1.7
Duct Test and Repair (in program)	2.8	4.7
Window Shade Screens	1.1	1.3
Direct Install LF Showerhead	2.1	2.5
Direct Install Faucet Aerators	5.3	6.2
Direct Install CFLs	6.6	7.2
Total Program	1.6	N/A <sup>8</sup>

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Table 7.

**Table 7. Other Financial Assumptions**

	Air Sealing	Attic Insulation and Sealing	Duct Repair (In Program)	Shade Screens	Direct Install Shower Heads	Direct Install Aerators	Direct Install CFLs
Measure Life (yrs):	13	20	10	10	10	10	6
Program Life (yrs):	5	5	5	5	5	5	5
Non-Incentive Costs	\$496	\$788	\$320	\$485	\$37	\$5	\$0.68
TRC Discount Rate	8.42%	8.42%	8.42%	8.42%	8.42%	8.42%	8.42%
Social Discount Rate	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
NTG Ratio:	90%	90%	105%	90%	100%	100%	78%

<sup>8</sup> Societal Cost test not calculated for total program.

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**Appendix 1 – Review of Other Programs and Best Practices**

**Typical Program Elements**

HPwES Core Components:

- Complete diagnostic assessment of building shell, mechanical systems and energy use
- “test in and test out” (measured air infiltration rate before and after the program)
- Summary report with efficiency, health, and safety recommendations and estimated savings

Typical eligible measures include:

- Shell improvements
  - Air sealing
  - Insulation
  - Windows and window treatments
  - HVAC improvements
  - Maintenance or replacement
  - Duct sealing, repair and insulating
- Promotion or installation of ENERGY STAR lighting and appliances.

Key program rebate elements:

- Low interest financing option (*either* a rebate or a loan)
- Rebates on individual measures
- Rebates as a % of total job costs

Trade ally management:

- Regular contractor meetings
- Contractor training classes
- Test equipment incentives
- Salesman incentives

QA/QC

- 5-15% inspection of work
- Customer survey
  - Quality of work – contractor
  - Customer experience - program
- Measurement & Verification

Keys to success:

- Active contractor recruitment, training, support & involvement
- Attractive financial incentives and financing options
- Customer care & recognition
- Quality marketing initiatives and materials
- Consistent quality assurance

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**Lessons Learned** (from *www.hpwes.org/2008compendium*)

**Lesson 1: Contractor Participation Is Key**

- A participation agreement is your contract with the contractor
- Be clear about what you will do and what they will do
- Participating contractors should complete at least 25 jobs per year to remain eligible for incentives
- Keep contractor requirements simple, but include things like eligibility criteria, conditions, standards, goals, reporting, quality assurance and logo use
- Make it a clear and easy process for reporting
- Make program benefits contingent on reaching goals
  - Benefits may include training, use of logo, incentives, recognition, etc.
  - Training is too valuable to give away
  - Track web and phone leads
- Don't list contractors on web site

**Lesson 2: Contractors Need to “Own” It**

- Recruitment of “right” contractors requires time and resources... the “wrong” contractors are easy to find, and will not lead to program success.
- Contractors will face new demands – the owner needs to be company champion and change agent. Otherwise, the contractors will slip back to old “business as usual.”
- Contractors must actively market new services – not rely on program to generate all leads

**Lesson 3: Financing Helps Sales**

- Ease of access is critical
- Simple, quick, and hassle free
- Low rates are not the most important feature
- Access to multiple financing options is a big plus
- Need ways to reach hard-to-qualify homeowners
- Financing and or incentives can play key role in getting contractors to submit completed jobs

**Lesson 4: Sponsorship is Engaging**

- Successful programs have very active sponsors
- Take leadership in marketing
- Protect the ENERGY STAR Logo
- Connects with broader industry- utilities, builders, state energy offices, etc
- Becomes the local energy efficiency champion
- Recognizes successful contractors – sponsors training events
- Participates as a national efficiency stakeholder
- Applies for ENERGY STAR National Awards

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### **Steps to Develop a HPwES Program**

EPA and DOE also recommend that program sponsors should complete the following steps.

#### **Step 1: Conduct Market Research**

Typical activities from successful program sponsors include the following actions:

- Establish an advisory board
- Conduct a market assessment
- Select a pilot market to launch program
- Select a program design
  - A bona fide whole-house approach
  - Basic design encourages consultant or contractor model
  - Need an effective strategy to turn audit recommendations into completed home improvements
- Need an effective strategy to monitor the quality of the work performed under the program
- Start developing a marketing plan

#### **Step 2: Develop Policies and Procedures**

Typical activities from successful program sponsors include the following actions:

- Strategy to recruit contractors to participate
- Training, incentives, financing, or equipment
- Leads
- Contractor participation agreement
- Eligibility criteria, conditions, standards, expectations/goals, reporting, and logo use
- Contractor reporting and quality assurance procedures
- Checklists, software, reviews and inspections
- Procedures to use financing or other incentives
- Keep it simple

#### **Step 3: Partner with ENERGY STAR**

Typical activities from successful program sponsors include the following actions:

- Summarize your program in an implementation plan
- Sign partnership agreement
- Use ENERGY STAR resources
  - Marketing toolkit
  - Consumer brochure
  - Contractor sales training
  - Contractor business development guide
  - Successful contractor profiles

To learn more about the HPwES Program, contact

Chandler von Schrader, EPA, 202 343-9096

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**APS Residential Existing Homes Program  
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**Appendix 2 - Res. Existing Homes Program 2010 Estimated Savings**

<b>Program</b>	<b>Measure</b>	<b>Gross Coincident kW Savings per Unit w/ Losses</b>	<b>Gross Annual Energy kWh Savings per Unit w/Losses</b>	<b>NTG Adjustment Factor</b>	<b>Net Coincident kW Savings per Unit w/ Losses</b>	<b>Net Annual Energy kWh Savings per Unit w/Losses</b>	<b># Units 2010</b>	<b>TOTAL Net kW Savings 2010</b>	<b>Meas. Life</b>	<b>TOTAL Net Lifetime kWh Savings from 2010 Measures</b>	<b>Total Net Annual kWh Savings 2010</b>
Res. Existing Homes	13 SEER HVAC	0.707	1,069	0.88	0.622	940	1,800	1,120	15	25,389,936	1,692,662
Res. Existing Homes	14 - 16 SEER HVAC	0.707	1,069	0.88	0.622	940	3,600	2,240	15	50,779,872	3,385,325
Res. Existing Homes	17+ SEER HVAC	0.707	1,069	0.88	0.622	940	600	373	15	8,463,312	564,221
Res. Existing Homes	HPwES Air Sealing	0.904	1,667	0.90	0.814	1,500	500	407	13	9,749,610	749,970
Res. Existing Homes	HPwES Air Sealing & Attic Insulation	1.086	2,293	0.90	0.977	2,064	250	244	20	10,317,600	515,880
Res. Existing Homes	HPwES Direct Install Low Flow Showerhead and shut-off valve	0.023	240	1.00	0.023	240	600	14	10	1,440,000	144,000
Res. Existing Homes	HPwES Direct Install Faucet Aerators	0.013	80	1.00	0.013	80	1,500	19	10	1,200,000	120,000
Res. Existing Homes	HPwES Direct Install CFL's	0.006	50	0.78	0.005	39	8,000	37	6	1,872,000	312,000
Res. Existing Homes	HPwES Shade Screens	1.318	1,866	0.90	1.186	1,679	200	237	10	3,358,800	335,880
Res. Existing Homes	Duct Test & Repair	1.739	1,227	1.05	1.826	1,289	2,000	3,652	10	25,771,200	2,577,120
<b>Total</b>							<b>19,050</b>	<b>8,344</b>		<b>138,342,330</b>	<b>10,397,058</b>

Where:

"Program" = Res. Existing Homes Program

"Measure" = DSM measure

"Gross Coincident kW savings per unit w/losses - Coincident kW savings/home/year before Net to Gross Adjustment. Includes capacity reserve factor.

"Gross Annual kWh savings per unit w/losses" = kWh savings/home/year before Net to Gross adjustment

"NTG Adjustment Factor" = Net to Gross Ratio = factor to account for free riders

"Net Coincident kW savings per unit w/losses - Coincident kW savings/home/year after Net to Gross Adjustment. Includes capacity reserve factor.

"Net Annual kWh savings per unit w/losses" = kWh savings/home/year after Net to Gross adjustment

"# Units 2010" = APS estimates of expected participation in each measure in 2010

"Total Net kW Savings 2010" = Total estimated demand savings in 2010

"Measure Life" - Expected lifetime of the measure - based on DEER database and other national sources

"Total Net Lifetime kWh Savings" = Estimated total energy savings over the expected life of measures installed in 2010

"Total Net Annual kWh Savings" = Estimated annual energy savings in 2010

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**Appendix 3 - Res. Existing Homes Program 2010 Net Benefits**

Measure	Avoided Cost Savings per Unit	Net Participant Cost per Unit	PA* Costs per Unit	TRC Costs per Unit	# Units 2010	Total PA Costs 2010	Total TRC Benefits 2010	Total TRC Costs 2010	TRC Net Benefits	TRC Benefit/Cost
13 SEER HVAC	\$ 1,141.44	\$ 671.19	\$ 196.02	\$ 867.12	1,800	\$ 352,836	\$ 2,054,592	\$ 1,560,978	\$ 493,614	1.32
14 - 16 SEER HVAC	\$ 1,141.44	\$ 671.19	\$ 196.02	\$ 867.12	3,600	\$ 705,672	\$ 4,109,184	\$ 3,121,956	\$ 987,228	1.32
17+ SEER HVAC	\$ 1,141.44	\$ 671.19	\$ 196.02	\$ 867.12	600	\$ 117,612	\$ 684,864	\$ 520,326	\$ 164,538	1.32
HPwES Air Sealing	\$ 1,431.58	\$ 540.00	\$ 496.00	\$ 1,036.00	500	\$ 248,000	\$ 715,790	\$ 518,000	\$ 197,790	1.38
HPwES Air Sealing & Attic Insulation	\$ 2,585.32	\$ 1,168.04	\$ 788.00	\$ 1,956.04	250	\$ 197,000	\$ 646,330	\$ 489,010	\$ 157,320	1.32
HPwES Direct Install Low Flow Showerhead and shut-off valve	\$ 189.28	\$ 52.06	\$ 37.00	\$ 89.06	600	\$ 22,200	\$ 113,568	\$ 53,436	\$ 60,132	2.13
HPwES Direct Install Faucet Aerators	\$ 67.13	\$ 7.60	\$ 5.00	\$ 12.60	1,500	\$ 7,500	\$ 100,695	\$ 18,900	\$ 81,795	5.33
HPwES Direct Install CFL's	\$ 12.85	\$ 1.28	\$ 0.68	\$ 1.96	8,000	\$ 5,440	\$ 102,800	\$ 15,680	\$ 87,120	6.56
HPwES Shade Screens	\$ 1,450.56	\$ 837.00	\$ 485.00	\$ 1,322.00	200	\$ 97,000	\$ 290,112	\$ 264,400	\$ 25,712	1.10
Duct Test & Repair	\$ 1,680.21	\$ 290.02	\$ 320.00	\$ 610.02	2,000	\$ 640,000	\$ 3,360,420	\$ 1,220,040	\$ 2,140,380	2.75
<b>TOTAL</b>					<b>19,050</b>	<b>\$ 2,393,260</b>	<b>\$ 12,178,355</b>	<b>\$ 7,782,726</b>	<b>\$ 4,395,629</b>	<b>1.56</b>

\* "PA Costs per Unit" = Program Administrative Costs per Unit which includes all non-incentive costs

# **Attachment 3**

## **APS Residential New Construction Program Savings and Net Benefits Information**



**DSM Estimated Energy Savings 2010 - Current and Proposed Residential New Construction Measures**

<b>Program</b>	<b>Measure</b>	<b>Gross Coincident kW Savings per Unit w/ Losses</b>	<b>Gross Annual Energy kWh Savings per Unit w/Losses</b>	<b>NTG Adjustment Factor</b>	<b>Net Coincident kW Savings per Unit w/ Losses</b>	<b>Net Annual Energy kWh Savings per Unit w/Losses</b>	<b># Units 2010</b>	<b>TOTAL Net kW Savings 2010</b>	<b>Meas. Life</b>	<b>TOTAL Net Lifetime kWh Savings from 2010 Measures</b>	<b>Total Net Annual kWh Savings 2010</b>
Res. NC	E Star Homes (15% Savings)	1.880	2,700	0.90	1.692	2,430	3,500	5,922	20	170,100,000	8,505,000
Res. NC	E Star Plus (30% Savings)	2.820	5,774	0.9	2.538	5,197	250	635	20	25,983,000	1,299,150
<b>Total</b>							<b>9,516</b>	<b>6,557</b>	20	<b>196,083,000</b>	<b>9,804,150</b>

Where:

"Program" = Residential Homes New Construction Program

"Measure" = DSM measure

"Gross Coincident kW savings per unit w/losses - Coincident kW savings/home/year before Net to Gross Adjustment. Includes capacity reserve factor.

"Gross Annual kWh savings per unit w/losses" = kWh savings/home/year before Net to Gross adjustment

"NTG Adjustment Factor" = Net to Gross Ratio = factor to account for free riders

"Net Coincident kW savings per unit w/losses - Coincident kW savings/home/year after Net to Gross Adjustment. Includes capacity reserve factor.

"Net Annual kWh savings per unit w/losses" = kWh savings/home/year after Net to Gross adjustment

"# Units 2010" = APS estimates of expected participation in each measure in 2010

"Total Net kW Savings 2010" = Total estimated demand savings in 2010

"Measure Life" - Expected lifetime of the measure - based on DEER database and other national sources

"Total Net Lifetime kWh Savings" = Estimated total energy savings over the expected life of measures installed in 2010

"Total Net Annual kWh Savings" = Estimated annual energy savings in 2010

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## Estimated Net Benefits 2010 - Residential New Construction Measures

Measure	Avoided Cost Savings per Unit	Net Participant Cost per Unit	PA Costs per Unit	TRC Costs per Unit	# Units 2010	Total PA Costs 2010	Total TRC Benefits 2010	Total TRC Costs 2010	TRC Net Benefits	TRC Benefit/Cost
E Star Homes	\$3,692.00	\$675	\$1,172	\$1,847	3,500	\$4,102,000	\$12,922,000	\$6,464,500	\$6,457,500	2.00
E Star Plus	\$6,604.00	\$3,152	\$600	\$3,752	250	\$150,000	\$1,651,000	\$938,000	\$713,000	1.76
TOTAL					3,750	\$4,252,000	\$14,573,000	\$7,402,500	\$7,170,500	1.97

**Attachment 4**

**APS Appliance Recycling Program**

**July 15, 2009**

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Appendix 1 - Appliance Recycling Program 2010 Estimated Savings

Appendix 2 - Appliance Recycling Program 2010 Estimated Net Benefits

## APS Appliance Recycling Program

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### 1. Program Concept and Description

The Appliance Recycling Program will target the removal of working second refrigerators and freezers in households. The average household replaces a refrigerator every ten years. However, many of the refrigerators and freezers being replaced are still functioning and often end up as energy guzzling back-up appliances in basements and garages or are sold in a used appliance market. APS proposes an approach that has been delivered successfully by utilities in many other states. Specifically, APS proposes to implement the program using an appliance recycling contractor that will provide the following turnkey implementation services: verification of customer eligibility; scheduling of pick-up appointments; appliance pick-up; and recycling services. This program will provide the dual benefit of reducing energy consumption and keeping the inefficient appliances out of the used market.

---

### 2. Target Market

The program is targeted at residential customers who are currently operating second refrigerators and/or freezers.

---

### 3. Current Baseline Conditions

National studies have found that approximately 20% of customers have a second refrigerator. Most of these refrigerators are ten years old or more. On average, these older inefficient refrigerators typically use between 1,500 and 2,000 kilowatt hours (“kWh”) per year. APS assumes that conditions are similar in Arizona.

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#### 3.1. Review of Existing Programs

Appliance recycling programs are a common DSM program across the United States. Impact evaluations of appliance recycling programs indicate that these programs are very cost effective, and they produce average net savings of approximately 700 to 1,100 kWh per year per participating household.

---

### 4. Program Eligibility

The program is available to all APS customers with operable secondary refrigerators or freezers that are between 10 and 30 cubic feet. There is a limit of two units per year per household.

---

## APS Appliance Recycling Program

### 5. Program Rationale and Objectives

The objective of the program is to permanently remove operable second refrigerators and freezers from the power grid and recycle them in an environmentally safe manner. This fits with the APS goal of producing long-term electric energy savings in the residential sector.

The customer will be offered free pick-up and recycling of their old operable second refrigerators and freezers. Typically, the customer would have to pay a municipal fee of about \$35 for appropriate disposal of the unit, so the free pick-up service provides an additional value. In addition, customers will be offered a cash rebate to further motivate the return of operable units.

**Table 1. Market Barriers and Program Elements**

Market Barrier	Program Element
<ul style="list-style-type: none"><li>• Lack of awareness about operating costs for “second” refrigerators and freezers, as well as older units</li></ul>	<ul style="list-style-type: none"><li>• Marketing materials with operating cost estimates</li></ul>
<ul style="list-style-type: none"><li>• Inconvenience of removing old units</li><li>• Cost of disposal</li></ul>	<ul style="list-style-type: none"><li>• Free pick-up/removal from customer site plus incentive</li><li>• Free disposal and proper recycling</li></ul>

### 6. Products and Services Provided

The products and services provided by the program include:

- Free pick-up and recycling of operable second refrigerators or freezers;
- A customer incentive of \$30 for the pick-up of their operable second refrigerator or freezer;
- Education and promotional efforts designed to inform customers about the benefits of recycling their second refrigerator and freezer, including brochures, program promotional material, and APS website content;
- Refrigerators and freezers will be recycled in accordance with established U.S. Environmental Protection Agency best practice industry standards to ensure optimal levels of recycled material and environmental compliance;
- For older refrigerators and freezers that contain CFCs (a potent greenhouse gas used as a blowing agent in older foam insulation products), the removal and proper disposal of the CFCs in these units is a significant additional environmental benefit of the program; and
- Refrigerators and freezers are currently shipped to out-of-state recycling facilities. This program will locate a recycling facility in Arizona, creating local jobs and reducing transport-related energy costs and impacts.

## 7. Delivery Strategy and Administration

The strategy to be employed for program delivery and administration is as follows:

- **Turnkey appliance pick-up/recycling:** APS will select an implementation contractor to provide comprehensive turnkey implementation services, from eligibility verification and scheduling of pick-ups to proper disposal and recycling of turned-in appliances.
- **Incentive coordination and processing:** The implementation contractor will coordinate prompt processing of incentive payments. As prompt incentive payment is essential to retailer/customer satisfaction, the implementation contractor will establish protocols and service level requirements that expedite payment.

Implementation-related administrative requirements will be handled by a third-party implementation contractor. The implementation contractor will be responsible for:

- Management of the scheduling, pick-up, and appliance recycling processes;
- Marketing strategy and messaging;
- Development and placement of promotional materials, advertising;
- Incentive processing;
- Data tracking and reporting;
- Investment tracking and reporting;
- Contact (call) center services;
- Managing public relations;
- Customer satisfaction/problem resolution.

To minimize free ridership, the program will use marketing messages targeted at customers with second refrigerators/freezers. Mass marketing emphasizing the cost of operating second refrigerators/freezers also has the potential to increase spillover impacts. The program will not be marketed at retail point-of-sale. This will avoid the situation where retailers are only promoting the service as convenient disposal for an appliance the customer is replacing regardless of the program.

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## 8. Marketing and Communications

Key elements of the marketing strategy include the following:

- Direct customer marketing through the APS Web site and bill insert newsletter;
- Web site links to EPA's new "ENERGY STAR Recycle My Old Fridge Campaign" at [www.recyclemyoldfridge.com](http://www.recyclemyoldfridge.com). Includes calculators to estimate savings;
- Press releases;
- Mass media advertising including print, radio, and/or television.

## APS Appliance Recycling Program

All marketing materials will carry a strong consumer education message emphasizing: (1) the cost of operating second refrigerators and freezers and older, inefficient appliances; (2) the benefits of early replacement with ENERGY STAR qualified models; and (3) the importance of proper disposal and recycling of older units. Marketing materials will leverage the ENERGY STAR brand, which enjoys a high level of consumer recognition and favorable associations.

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### **9. Program Implementation Schedule**

The Appliance Recycling Program will begin immediately upon approval with the goal of serving at least 10,000 homes in 2010. Assumptions about measure participation and savings are based on receiving measure approval from the Arizona Corporation Commission prior to January 1, 2010.

---

### **10. Monitoring and Evaluation Plan**

All evaluation activities will be conducted by the APS measurement, evaluation and research (“MER”) contractor. An integrated evaluation approach will be taken which includes the following components:

- Addressing evaluation at the onset of program design, collecting evaluation data as part of program administration;
- Assessing and documenting baseline conditions;
- Establishing tracking metrics;
- Developing and refining deemed savings measure databases;
- Conducting primary and secondary research as part of impact and process evaluations.

The overall goal of the impact evaluation will be to validate/calibrate the deemed savings values and determine program cost-effectiveness. Primary impact metrics are savings per unit, program participants, net-to-gross ratio, and program cost-effectiveness. Validation/calibration of deemed savings values will be determined by an analysis of program records and testing a sample of equipment picked up for recycling. Primary research may be conducted to determine the impact of variables such as size of refrigerator, effective life of the equipment, and owner utilization. Self-report surveys with both participants and nonparticipants will be used to assess free riders/spillover, program awareness, barriers to participation, participant satisfaction, and other process efficiency issues. Interviews will also be conducted with program managers and implementation contractors. These surveys will be enhanced by collecting market data and assessing trends.

The process evaluation will be conducted during the first program year and then coordinated with impact evaluation work. Wherever it is practical and appropriate, evaluation activities will be conducted in conjunction with other utilities and agencies in the state to efficiently utilize resources and help ensure consistency.

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## APS Appliance Recycling Program

### 11. Quality Assurance/Quality Control

- Refrigerators and freezers will be checked for functionality before removal as only operating units will be picked up;
- Only verified second refrigerators will be picked up;
- All refrigerators will be decommissioned by the implementation contractor, or accredited third party, in accordance with all applicable local state and federal standards for proper handling of refrigerants;
- Customer satisfaction surveys will be sent to a random sample of customers;
- All program data tracking will be performed by the program implementer and reported to APS monthly;
- The program evaluation process (described above) provides an additional level of quality assurance for the program.

### 12. Program Costs

The annual budget of approximately \$1.5M will be allocated as shown in Table 2.

**Table 2. 2010 Appliance Recycling Program Budget**

Year	2010
Total Budget	\$1,428,000
Incentives	\$286,000
Program Delivery (all non-incentive costs)	\$1,142,000
Incentives as % of Budget	20%

### 13. Estimated Energy Savings

Total annual participation goals and demand and energy savings are presented in Table 3 and Table 4. The program expects, on average, 10,000 appliances annually will be removed by the program, with approximately 90% being refrigerators and 10% freezers.

**Table 3. Estimated Appliance Recycling Annual Energy and Demand Savings Per Home**

Measure	Net Annual kWh Savings per Unit w/ Losses	Net Coin. kW Savings per Unit w/ Losses
Refrigerators	1,061	0.153
Freezers	1,061	0.153

## APS Appliance Recycling Program

**Table 4. Estimated Appliance Recycling Program Estimated Energy and Demand Savings**

Year	2010
Number of expected participating units	9,516
Net Coincident peak (MW)	1.5
Energy Savings (MWh)	10,100

### 14. Program Cost Effectiveness

The cost effectiveness of each measure and each program as a whole was assessed using the Total Resource Cost (“TRC”) test, and the Societal Cost (“SC”) test.

The cost effectiveness analysis requires estimation of:

- Net demand and energy savings attributable to the program;
- Net incremental cost to the customer of purchasing qualifying equipment, and of conducting quality installation and test and repair activities;
- APS program administration costs;
- The present value of program benefits including APS avoided costs over the life of the measures.

Table 5 provides a summary of the benefit/cost analysis results for this program.

**Table 5. Benefit-cost Analysis Results**

Cost Effectiveness Tests (Benefit/Cost Ratio)	TRC	SC
Refrigerators	2.9	3.2
Freezers	2.9	3.2

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Table 6.

**Table 6. Other Financial Assumptions**

Refrigerator/Freezer per Unit	
Measure Life (yrs):	6
Program Life (yrs):	5
Non-Incentive Costs	\$120
TRC Discount Rate	8.42%
Social Discount Rate	5.00%
NTG Ratio:	61%

## APS Appliance Recycling Program

### Appendix 1 - Appliance Recycling Program 2010 Estimated Savings

<b>Program</b>	<b>Measure</b>	Gross Coincident kW Savings per Unit w/ Losses	Gross Annual Energy kWh Savings per Unit w/Losses	NTG Adjustment Factor	Net Coincident kW Savings per Unit w/ Losses	Net Annual Energy kWh Savings per Unit w/Losses	# Units 2010	<b>TOTAL Net kW Savings 2010</b>	Meas. life	<b>TOTAL Net Lifetime kWh Savings from 2010 Measures</b>	<b>Total Net Annual kWh Savings 2010</b>
Appliance Recycling	Refrigerators	0.250	1,740	0.61	0.153	1,061	8,564	1,307	6	54,538,978	9,089,830
Appliance Recycling	Freezers	0.250	1,740	0.61	0.153	1,061	952	145	6	6,062,717	1,010,453
<b>Total</b>							<b>9,516</b>	<b>1,452</b>	<b>6</b>	<b>60,601,694</b>	<b>10,100,282</b>

Where:

"Program" = Appliance Recycling Program

"Measure" = DSM measure

"Gross Coincident kW savings per unit w/losses - Coincident kW savings/home/year before Net to Gross Adjustment. Includes capacity reserve factor.

"Gross Annual kWh savings per unit w/losses" = kWh savings/home/year before Net to Gross adjustment

"NTG Adjustment Factor" = Net to Gross Ratio = factor to account for free riders

"Net Coincident kW savings per unit w/losses - Coincident kW savings/home/year after Net to Gross Adjustment. Includes capacity reserve factor.

"Net Annual kWh savings per unit w/losses" = kWh savings/home/year after Net to Gross adjustment

"# Units 2010" = APS estimates of expected participation in each measure in 2010

"Total kW Savings 2010" = Total estimated demand savings in 2010

"Measure life" - Expected lifetime of the measure - based on DEER database and other national sources

"Total Lifetime kWh Savings" = Estimated total energy savings over the expected life of measures installed in 2010

"Total Annual kWh Savings" = Estimated annual energy savings in 2010

APS Appliance Recycling Program

**Appendix 2 - Appliance Recycling Program 2010 Estimated Net Benefits**

Measure	Avoided Cost Savings per Unit	Net Participant Cost per Unit	PA* Costs per Unit	TRC Costs per Unit	# Units 2010	Total PA Costs 2010	Total TRC Benefits 2010	Total TRC Costs 2010	TRC Net Benefits	TRC Benefit/Cost
Refrigerators	\$ 350.70	\$ -	\$ 120	\$ 120	8,564	\$ 1,027,680	\$ 3,003,395	\$ 1,027,680	\$ 1,975,715	2.92
Freezers	\$ 350.70	\$ -	\$ 120	\$ 120	952	\$ 114,240	\$ 333,866	\$ 114,240	\$ 219,626	2.92
<b>TOTAL</b>					<b>9,516</b>	<b>\$ 1,141,920</b>	<b>\$ 3,337,261</b>	<b>\$ 1,141,920</b>	<b>\$ 2,195,341</b>	<b>2.92</b>

\* "PA Costs per Unit" = Program Administrative Costs per Unit which includes all non-incentive costs

APS Non-Residential  
New Construction Program

**ATTACHMENT 5**

**APS Non-Residential New Construction Program**

**July 15, 2009**

APS Non-Residential  
New Construction Program

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## APS Non-Residential New Construction Program

### 1. Program Concept and Description

The Non-Residential New Construction energy efficiency program, in conjunction with the other APS Non-Residential energy efficiency programs, is marketed to customers under the APS Solutions for Business program name. The New Construction program consists of six major components:

1. Study Incentives and Design Assistance - Encourages and enables owners to utilize studies that identify individual energy efficiency measures or a whole-building integrated design approach that results in buildings that are at least 10% more efficient than the current building standards. The APS Solutions for Business program pays APS customers incentives to have these studies completed by design professionals of 50% of the cost of the study/design assistance, up to \$10,000 per study.
2. Measure Incentives - Provides incentives to building owners or developers to invest in energy efficient technologies and buildings. Beginning in 2010, Whole Building Design monetary incentives will be paid to customers/building owners/developers and the design team for incorporating energy efficient design into new buildings.
3. Trade Allies – Promotes energy efficiency through a participating trade ally network including energy engineers, architects, contractors, and consultants.
4. Outreach and Training – Increases awareness of energy efficient methods, technologies, and the APS Solutions for Business program offerings. These training classes will be offered to customers, developers and trade allies.
5. Technical Support – Provides services that facilitate the adoption of energy efficient technologies and design practices in new buildings. The APS Solutions for Business team will work directly with customers, developers, and trade allies to incorporate energy efficiency and the APS Solutions for Business incentives into the New Construction projects.
6. Tracking, Quality Assurance, and Administration – Ensures that all program activities and accomplishments are tracked and reported as required

This program has been significantly modified for 2010 by adding a Whole Building Design concept to the other current program offerings. This concept will further encourage and enable the adoption of energy efficient technologies and practices in new buildings. The integrated Whole-Building Design incentive will be paid based on the modeled amount of annual electricity savings compared to ASHRAE 90.1 -- 2007.

#### **Energy Studies, Design Assistance, and Commissioning:**

Energy Studies identifies energy efficient measures and their savings to assist customers in choosing to invest in energy efficient systems and equipment.

Design Assistance emphasizes integrated design and influences equipment/systems selection and specification early in the design development process to improve the energy efficiency of new non-residential construction projects and major renovations. Design Assistance may include modeling of integrated design packages using building energy simulation models.

## APS Non-Residential New Construction Program

Commissioning services that emphasize and identifies energy savings opportunities are also supported through the program. Commissioning services are defined here as a systematic process to optimize a new building's operations and to ensure that the new building operates and performs as intended by the designer.

For each of these types of professional services (Energy Studies, Design Assistance, and Commissioning), the program provides customers incentives to cover a portion of the incremental cost involved in assessing alternative design options that would improve the energy efficiency of the project, recognizing that time and budget constraints are a major market barrier to the design and construction of high efficiency buildings. These incentives will cover 50% of the cost of the study with a maximum incentive limit of \$10,000 for each study.

### **Measure Incentives:**

The program provides two participation paths for implementation of enhanced design features: 1) prescriptive incentives for specific energy efficiency measures, and 2) custom incentives based on performance and driven by energy savings for projects reaching beyond the standard, prescriptive measures. Energy efficient measures that are not found in the prescriptive list can be applied through the custom program. The custom program has been enhanced to include a whole building design incentive structure that rewards both the owner and the design team for building energy efficient buildings, with the incentives increasing as the building becomes more energy efficient.

All measure incentives will be paid after completion of the project and after verification that the energy efficiency measure(s) were installed.

### **Prescriptive Measures:**

Prescriptive incentives are provided for building owner/developers for energy-efficiency improvements in lighting, HVAC ("heating, ventilation, and air conditioning"), motors, building envelope (windows), and refrigeration applications. The lighting incentives are based on a lighting power density (Watts per square foot) methodology. Direct install energy efficiency measures are not included in the New Construction program. All other prescriptive measures within the New Construction programs are similar to prescriptive measures in the other Non-Residential programs (Large Existing, Small Business, and Schools). All prescriptive measures remain unchanged from 2009, as approved by the Commission in December of 2008. These measures can be found on the APS web site at:

<http://www.aps-solutionsforbusiness.com/ProjectCenter/Default.aspx?tabid=1872>

### **Custom Measures:**

There will be types of custom measures within the New Construction program.

1. Classic (original) custom measures
2. Whole Building design



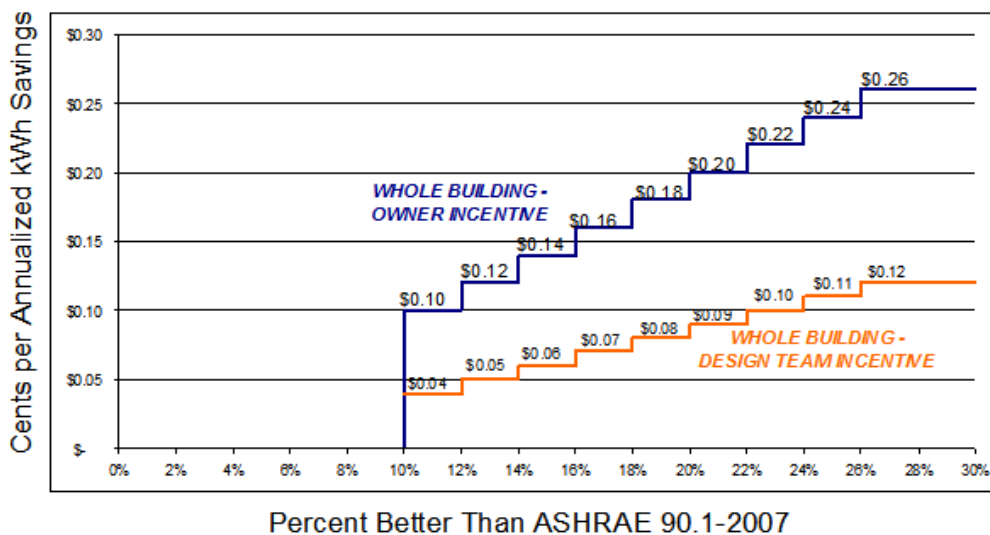
## APS Non-Residential New Construction Program

Classic custom measures remain unchanged from 2009. If a customer has a measure not found within the prescriptive list of measures, they may apply the energy efficiency project under a custom measure. This one time incentive will pay 11 cents per kWh for the electric energy saved during the first year of operation, up to 50% of the incremental cost of the measure.

The one significant change to the New Construction program for 2010 is the introduction of incentives for Whole Building Design. The whole building approach optimizes energy savings by integrating the design of the building envelope, HVAC systems, and lighting systems. Such an approach requires building simulation tools to calculate total energy consumption for the planned building and its respective baseline.

APS is proposing energy efficiency incentives for owners/developers and for the design team. Incentives are only offered for those projects achieving at least 10% savings when compared to ASHRAE 90.1 -- 2007. The incentive structure is best depicted in the following graph.

### Whole Building Energy Efficiency Incentives



The incentive breaks are consistent with the latest revision (2009) of the LEED (Leadership in Energy and Environmental Design) standard. The measure cap for the Whole Building incentive will be 75% of the incremental cost of the Whole Building measures. Projects receiving Whole Building incentives will be ineligible for other prescriptive or custom incentives, unless those measures were not included in the whole building model (example: external lighting).

To receive the APS Solutions for Business Whole Building incentive, applicants must provide an energy simulation that estimates the annual energy savings in support of the incentive amount requested for installing energy-efficient measures. This simulation must include:

- Adequate documentation (list all assumptions and inputs)
- Be easily interpreted by a third party reviewer

## APS Non-Residential New Construction Program

- Demonstrate annual energy savings (in kWh) over a standard design -- American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) standard 90.1-2007

In addition, the customer and/or design team must coordinate with the APS Solutions for Business program during construction to ensure the energy efficient design features are implemented.

The simulation and its results will be reviewed and approved by the APS Solutions for Business energy engineers to verify the savings validity and establish the incentive amount. Furthermore, APS reserves the right to determine the final energy savings estimate and associated incentive payout amount(s) in this DSM program. The energy simulation may also be a requirement of the LEED certification.

### **Trade Allies**

The Trade Ally feature of the program promotes energy efficiency through a participating trade ally network including energy engineers, architects, contractors, and consultants. As an APS Solutions for Business Trade Ally, a company will be listed on the APS Solutions for Business web site. Customers interested in what companies that can assist on energy efficiency and that are familiar with the APS Solutions for Business program will be able to find these organizations on the web site. The trade allies will receive periodic program updates through face-to-face presentations and newsletters. As another benefit of being a trade ally, employees of the trade ally companies get half off on training class tuition sponsored by the program and there is periodic recognition for trade allies that do a great job in promoting and representing the program.

### **Outreach and Training**

Training classes increase awareness of energy efficient methods, technologies, and the APS Solutions for Business program offerings. Full day and half day training classes are offered to customers, developers and trade allies throughout the year on a variety of energy efficiency topics such as: lighting, motors, chillers, HVAC, energy studies, and various other topics. In addition to these training classes, the program also provides 50% tuition reimbursement for other training related to LEED, Certified Energy Managers (CEM), Building Operator (BOT), Facility Management Training (FMT), and Certified HVAC Contractor.

The APS Solutions for Business program also provides customer outreach through one-on-one customer meetings, seminar presentations, and trade show booths.

### **Technical Support**

Technical Support provides services that facilitate the adoption of energy efficient technologies and design practices in new buildings. The APS Solutions for Business energy engineers work directly with customers, developers, and trade allies to incorporate energy efficiency and the APS Solutions for Business incentives into New Construction projects.

<p>APS Non-Residential New Construction Program</p>
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**2. Program Eligibility and Target Market**

- Incentives are available to existing and new non-residential retail customers within APS’ service territory; most non-residential rate schedules are eligible. Ineligible customer accounts are those accounts that do not fund DSM through their rate schedule by not paying the System Benefits charge or the DSM Adjustor. The energy savings from installed measures must occur on a meter with an eligible rate schedule. The measures included in this program are not designed to promote fuel-switching.
- This program is for both new construction projects and major renovation projects of existing non-residential customers. In general, major renovation is defined as a major construction project or rebuilding of an existing facility that includes building envelop and energy-efficiency upgrades consistent with those found in new construction projects for which building energy codes would apply.
- All size customers qualify for the New Construction program. However, the market for new non-residential construction is similar to the large existing non-residential APS customers (maximum monthly billed demand greater than 100 kW within the first year of operation). Types of customers that are this size include, but are not limited to:
  - Large Offices
  - Large Retail
  - Large Groceries
  - Resorts/Large Hotels
  - College/University
  - Inpatient Healthcare

**3. Current Baseline Conditions**

Lighting, HVAC, Motors, Refrigeration, and other miscellaneous energy loads comprise the energy loads used by these large customers. The following is a breakdown of the energy loads based on the 2007 APS Energy Efficiency Baseline Study:

	<b><u>Lighting</u></b>	<b><u>HVAC</u></b>	<b><u>Motors</u></b>	<b><u>Refrigeration</u></b>	<b><u>Other</u></b>
Large Offices	28%	31%	10%	nil	31%
Large Retail	45%	31%	6%	nil	18%
Large Groceries	21%	15%	2%	52%	10%
Resorts/Hotels	36%	51%	4%	nil	9%
College/University	43%	46%	3%	3%	5%
Inpatient Healthcare	36%	48%	4%	nil	12%
Industrial	7%	9%	50%	nil	34%

<p>APS Non-Residential New Construction Program</p>
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Other miscellaneous energy loads include plug loads, water heating, process heating and cooling, cooking, and any other miscellaneous electric energy that a nonresidential customer may consume.

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#### **4. Program Rationale and Objectives**

The New Construction program increases the awareness and knowledge of developers, facility managers, and business owners and operators on the benefits of including energy efficiency measures in new building design and construction. It provides decision making support to building owners/developers through the design assistance aspect of the program. The program team identifies construction projects for new buildings or major renovations early in the design and/or development process in an effort to improve the energy-efficiency measures installed. The program promotes the installation of high-efficiency equipment and systems in new and major renovation construction projects and promotes the integrated system approach to new construction projects.

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#### **5. Products and Services Provided**

- Full day and semester long educational classes will be offered by the program for customers, developers, and trade allies regarding energy efficient technologies and processes.
  - Educational and promotional material will be offered to provide building owners/developers information about the benefits of energy efficiency improvements, improved systems performance and integrated design. These materials include educational brochures, program promotional material and website content.
  - Customer incentives for Energy Studies, Design Assistance, and Commissioning will be offered by the program to help identify energy efficient strategies, technologies, and measures.
  - Prescriptive and custom incentives are offered to help customers offset the first cost for implementing energy efficiency measures.
  - A description of the existing incentives (Studies, Prescriptive, and Custom) can be found in the aps website at:  
<http://www.aps-solutionsforbusiness.com/ProjectCenter/Default.aspx?tabid=1872>
  - The program will offer a Whole Building Custom incentive in 2010 (summarized earlier).
  - The maximum DSM incentive payout (for all studies, prescriptive and custom incentives combined) is capped at \$300,000 total, per customer, per budget year in this program.
- 

#### **6. Delivery Strategy and Administration**

- APS selected KEMA as the implementation contractor (“IC”) for the all of the Solutions for Business programs (other than the Energy Information Services program).

## APS Non-Residential New Construction Program

- APS administers the program by providing ACC regulatory interface and compliance, oversight of KEMA's activities, maintaining program budgets, and providing program direction.
- KEMA provides implementation services that include: program design, marketing, vendor referrals, application and incentive processing, participation tracking and reporting, quality control, and technical support.
- KEMA services will also include a team specific to New Construction and the Whole Building design.
- The Solutions for Business team will offer specific training to customers and trade allies on Whole Building Design.
- The Solutions for Business team developed and administers a trade ally program which maintains a web site list of participating contractors, engineers, architects, consultants, and energy service companies familiar with the APS Solutions for Business program. This list gives customers a place to find trade allies that have a working knowledge of the APS Solutions for Business program. These trade allies serve as an extended sales force for the program.
- In addition to trade allies, the Solutions for Business team has also partnered with a number of organizations and trade associations to promote the APS Solutions for Business program. These organizations include but are not limited to:
  - Air Conditioning Contractors of America (ACCA) – Arizona Chapter
  - American Institute of Architects (AIA) -- Arizona Chapter
  - Arizona Department of Commerce Energy Office (ADCEO)
  - Arizona Society of CPAs
  - Association of Energy Engineers (AEE) – Arizona Chapter
  - Illuminating Engineering Society – North America (IESNA) – Arizona Chapter
  - U. S. Green Building Council (USGBC) -- Arizona Chapter

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### **7. Marketing and Communications**

- The Non-Residential New Construction energy efficiency program, in conjunction with the other APS Non-Residential energy efficiency programs, is marketed under the APS Solutions for Business program name.
  - The APS Solutions for Business team provides direct marketing to customers, developers, owners for new construction and major renovation projects, fielding of customer inquiries, and promotion of program products and services.
  - The APS Solutions for Business team also provides marketing through, program application content, website content, media ads, trade show booths, and public relations.
  - A Marketing Plan report was submitted to the ACC on June 30, 2006 and a Marketing Progress report was submitted to the ACC on March 12, 2010. This program continues to follow the plan as previously outlined.
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<p>APS Non-Residential New Construction Program</p>
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**8. Program Implementation Schedule**

The New Construction program obtained final approval in Decision 70637 dated December 11, 2008. The current change to the New Construction program is the Whole Building energy efficiency incentive schedule. The primary assumption to the program participation levels, savings estimates, and budget is that the Whole Building energy efficiency incentives, and the program budget be approved by the Commission and the program budget be approved by the Commission no later than November 30, 2009. By doing so, the APS program team will have time to implement these new program enhancements in the first quarter of 2010.

**9. Monitoring and Evaluation Plan**

Summit Blue Consulting provides the DSM program Measurement and Evaluation services. These Measurement and Evaluation activities include, but are not limited to:

- Performing process evaluation to indicate how well programs are working to achieve objectives
- Performing impact evaluation to verify that energy efficiency measures are installed as expected; measurement of savings on installed projects to monitor the actual program savings that are achieved; and research activities to refine savings and cost benefit models and identify additional opportunities for energy efficiency.

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

**10. Program Budget**

The following is the budget for the Large New Construction & Major Renovation energy efficiency program for 2010:

<b>Rebates &amp; Incentives</b>	<b>Training</b>	<b>Consumer Education</b>	<b>Program Implementation</b>	<b>Program Marketing</b>	<b>Plan &amp; Admin</b>	<b>Program Total Cost</b>
<b>3,547,000</b>	<b>75,000</b>	<b>25,000</b>	<b>1,053,000</b>	<b>564,000</b>	<b>173,000</b>	<b>5,437,000</b>

**11. Estimated Energy Savings**

The total estimated program cost per lifetime kWh saved is \$0.0090, (total program costs / lifetime kWh = \$5,437,000/ 607,000,000). Note that this value does not include MER or Performance Incentive costs. These values are factored in after all other programs are summed together.

**APS Non-Residential  
New Construction Program**

The following Table shows the estimated energy savings for the 2010 program year (net of free riders):

<b>MW Demand Savings</b>	<b>Annual MWh Savings</b>	<b>Lifetime MWh Savings</b>
<b>6.9</b>	<b>39,200</b>	<b>607,000</b>

**12. Program Cost Effectiveness**

The cost effectiveness of each measure and each program as a whole was assessed using the Total Resource Cost (TRC) test and the Societal Cost (SC) test (the Societal Cost Test analysis uses a lower societal discount rate than the TRC analysis).

The cost effectiveness analysis requires estimation of:

- Net demand and energy savings attributable to the program;
- Net incremental cost to the customer of purchasing qualifying equipment, and of conducting quality installation and test & repair activities;
- APS's program administration costs;
- The present value of program benefits including APS avoided costs over the life of the measures; and

The following table provides a summary of the benefit/cost analysis results for measures in this program.

The Large New Construction program is cost effective with a Societal Cost Test benefit/cost ratio of 3.89.

<b>Total APS Program Cost 2010</b>	<b>\$/Lifetime kWh</b>	<b>Societal Cost Test Total Benefits</b>	<b>Societal Cost Test Total Costs</b>	<b>Societal Cost Test Benefit/Cost Ratio</b>
<b>\$5,437,000</b>	<b>\$0.0090</b>	<b>\$27,685,500</b>	<b>\$7,110,700</b>	<b>3.89</b>

**ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT ADJUSTMENT CHARGE**

**Attachment 6**

**DSMAC Schedules  
Proposed Cost Recovery for All 2009 and 2010 Costs**

**July 15, 2009**



ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT ADJUSTMENT CHARGE

Proposed

Cost Recovery for All 2009 Costs and 2010 Costs

ARIZONA PUBLIC SERVICE COMPANY  
 DEMAND SIDE MANAGEMENT PROGRAM

TRUE-UP PERIOD xxxx  
 DSMAC REVENUE

(A)  
 True-Up Period

Line No.		DSMAC Revenue for xxxx
1	Total	N/A <sup>1</sup>

<sup>1</sup>For this filing this value was intentionally omitted as revenue and cost were the same as of April 2009.

ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT PROGRAM

RATE APPLICABLE MARCH 1, 2010 THROUGH FEBRUARY 28, 2011  
PROGRAM COSTS AND INCENTIVES

Line No.	Program	(A)	(B)
		True-Up Period Program Costs for xxxx <sup>1</sup>	Forecast Period Program Costs Forecast 2009 and 2010 <sup>2</sup>
1	Energy Efficiency (EE) Program Costs (PC)	N/A	\$ 45,870,000
2	Performance Incentives (PI) <sup>3</sup>	N/A	\$ 9,537,000
3	Sub Total	\$ -	\$ 55,407,000
4	Demand Response (DR) PC	N/A	\$ 3,267,500
5	Total	\$ -	\$ 58,674,500

<sup>1</sup>For this filing this value was intentionally omitted as revenue and cost were the same as of April 2009.

<sup>2</sup>This is the forecast cost for EE PC, PI, and DR PC based on 2009 Budget and the 2010 Implementation Plan less the \$20M to be collected in 2009 and 2010 base rates.

<sup>3</sup>EE PI is calculated on total PC including PI; PI is 10% of PC in 2009 and 14% in 2010 per proposed Settlement Agreement.

ARIZONA PUBLIC SERVICE COMPANY  
 DEMAND SIDE MANAGEMENT PROGRAM

TRUE-UP PERIOD xxxx  
 TRUE-UP BALANCING ACCOUNT COMPUTATION

Line No.	Date Period	Cost, Collection and Interest	Reference	Amount
1	N/A	DSMAC Revenue - TU	Schedule 1, Line 1, Column A	N/A
2	N/A	DSMAC Program Costs - TU	Schedule 2, Line 5, Column A	N/A
3		Sub Total	(Line 1 - Line 2)	\$ -
4	Treasury constant maturities rate 1/2/2009	Interest = 0.4%	(Line 3 * Interest Rate)	\$ -
5		Total TU Balance Account	(Line 3 + Line 4)	\$ -

ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT PROGRAM

RATE APPLICABLE MARCH 1, 2010 THROUGH FEBRUARY 28, 2011  
CALCULATION OF THE DSMAC

Line No.	DSMAC Calculations	Reference	Amount	Units
1	Program forecast costs for adjustor period in 2010	Schedule 2, Line 5, Column B	\$ 58,674,500	
2	True-Up Account	Schedule 3, Line 5	N/A	
3	Total amount to be collected	(Line 1 - Line 2)	\$ 58,674,500	
4	Forecast retail kWh sales for adjustor period <sup>1</sup>		28,576,269,000	kWh
5	Proposed kWh adjustor charge for adjustor period <sup>2</sup>	(Line 4 / Line 5)	\$ 0.002053	per kWh
6	Forecast General Service kWh sales for adjustor period <sup>3</sup>		15,279,674,000	kWh
7	Amount to be collected from General Service demand metered customers for adjustor period	(Line 6 * Line 7)	\$ 31,369,171	
8	Forecast General Service demand metered customer kW		34,927,000	kW
9	Proposed kW adjustor charge for forecast period <sup>4</sup>	(Line 8 / Line 9)	\$ 0.898135	per kW

<sup>1</sup>Forecast retail kWh sales excludes E-3 and E-4 kWh.

<sup>2</sup>\$/kWh charge for all Residential customers and General Service customers with no demand charge.

<sup>3</sup>Forecast General Service kWh for customers with demand charges.

<sup>4</sup>\$/kW charge for General Service customers with demand charges.



**ADJUSTMENT SCHEDULE DSMAC-1  
DEMAND SIDE MANAGEMENT COST ADJUSTMENT**

APPLICATION

The Demand Side Management Adjustment Charge (“DSMAC”) shall be applied monthly to every metered and/or non-metered retail Standard Offer or Direct Access service with the exception of customers served on rate schedules E-3 and E-4, and solar rates Solar-1, Solar-2 and SP-1. All provisions of the customer’s currently applicable rate schedule will apply in addition to this adjustment charge. The DSMAC is applied to Standard Offer or Direct Access customer’s bills as monthly charge to recover the cost of Commission approved demand side management programs above those costs included in base rates. The DSMAC will be changed in billing cycle 1 of the March revenue month and will not be prorated. The DSMAC and the EPS Surcharge adjutor may be combined on the customer’s bill and appear on the "Environmental Benefits Surcharge" line. Details of how the DSMAC is derived and administered can be found in the Demand Side Management Adjustment Charge Plan for Administration.

RATE

The charge shall be calculated at the following rate:

For all residential customers and general service customers whose billing does not include demand charges:

| All kWh \$0.00~~0605~~2053 per kWh

For general service customers whose billing includes demand charges:

| All metered kW \$0.~~27332889~~8135 per kW



**ADJUSTMENT SCHEDULE DSMAC-1  
DEMAND SIDE MANAGEMENT COST ADJUSTMENT**

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APPLICATION

The Demand Side Management Adjustment Charge (“DSMAC”) shall be applied monthly to every metered and/or non-metered retail Standard Offer or Direct Access service with the exception of customers served on rate schedules E-3 and E-4, and solar rates Solar-1, Solar-2 and SP-1. All provisions of the customer’s currently applicable rate schedule will apply in addition to this adjustment charge. The DSMAC is applied to Standard Offer or Direct Access customer’s bills as monthly charge to recover the cost of Commission approved demand side management programs above those costs included in base rates. The DSMAC will be changed in billing cycle 1 of the March revenue month and will not be prorated. The DSMAC and the EPS Surcharge adjustor may be combined on the customer’s bill and appear on the "Environmental Benefits Surcharge" line. Details of how the DSMAC is derived and administered can be found in the Demand Side Management Adjustment Charge Plan for Administration.

RATE

The charge shall be calculated at the following rate:

For all residential customers and general service customers whose billing does not include demand charges:

All kWh	\$0.002053	per kWh
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For general service customers whose billing includes demand charges:

All metered kW	\$0.898135	per kW
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ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT ADJUSTMENT CHARGE

Alternative

Cost Recovery For One-Third Of 2009 Costs And All 2010 Costs



ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT PROGRAM

TRUE-UP PERIOD xxxx  
DSMAC REVENUE

(A)  
True-Up Period

Line No.		DSMAC Revenue for xxxx
1	Total	N/A <sup>1</sup>

<sup>1</sup>For this filing this value was intentionally omitted as revenue and cost were the same as of April 2009.

ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT PROGRAM

RATE APPLICABLE MARCH 1, 2010 THROUGH FEBRUARY 28, 2011  
PROGRAM COSTS AND INCENTIVES

Line No.	Program	(A) True-Up Period Program Costs for xxx <sup>1</sup>	(B) Forecast Period Program Costs Forecast for 1/3 of 2009 and all of 2010 <sup>2</sup>
1	Energy Efficiency (EE) Program Costs (PC)	N/A	\$ 37,236,667
2	Performance Incentives (PI) <sup>3</sup>	N/A	\$ 7,837,000
3	Sub Total	\$ -	\$ 45,073,667
4	Demand Response (DR) PC	N/A	\$ 2,932,167
5	Total	\$ -	\$ 48,005,834

<sup>1</sup>For this filing this value was intentionally omitted as revenue and cost were the same as of April 2009.

<sup>2</sup>This is the forecast cost for EE PC, PI, and DR PC based on 1/3 of the 2009 Budget and the full 2010 Implementation Plan less the \$20M to be collected in 2009 and 2010 base rates.

<sup>3</sup>EE PI is calculated on total PC including PI; PI is 10% of PC in 2009 and 14% in 2010 per proposed Settlement Agreement.

ARIZONA PUBLIC SERVICE COMPANY  
 DEMAND SIDE MANAGEMENT PROGRAM

TRUE-UP PERIOD xxxx  
 TRUE-UP BALANCING ACCOUNT COMPUTATION

Line No.	Date Period	Cost, Collection and Interest	Reference	Amount
1	N/A	DSMAC Revenue - TU	Schedule 1, Line 1, Column A	N/A
2	N/A	DSMAC Program Costs - TU	Schedule 2, Line 5, Column A	N/A
3		Sub Total	(Line 1 - Line 2)	\$ -
4	Treasury constant maturities rate 1/2/2009	Interest = 0.4%	(Line 3 * Interest Rate)	\$ -
5		Total TU Balance Account	(Line 3 + Line 4)	\$ -

ARIZONA PUBLIC SERVICE COMPANY  
DEMAND SIDE MANAGEMENT PROGRAM

RATE APPLICABLE MARCH 1, 2010 THROUGH FEBRUARY 28, 2011  
CALCULATION OF THE DSMAC

Line No.	DSMAC Calculations	Reference	Amount	Units
1	Program forecast costs for adjustor period in 2010	Schedule 2, Line 5, Column B	\$ 48,005,834	
2	True-Up Account	Schedule 3, Line 5	N/A	
3	Total amount to be collected	(Line 1 - Line 2)	\$ 48,005,834	
4	Forecast retail kWh sales for adjustor period <sup>1</sup>		28,576,269,000	kWh
5	Proposed kWh adjustor charge for adjustor period <sup>2</sup>	(Line 4 / Line 5)	\$ 0.001680	per kWh
6	Forecast General Service kWh sales for adjustor period <sup>3</sup>		15,279,674,000	kWh
7	Amount to be collected from General Service demand metered customers for adjustor period	(Line 6 * Line 7)	\$ 25,669,852	
8	Forecast General Service demand metered customer kW		34,927,000	kW
9	Proposed kW adjustor charge for forecast period <sup>4</sup>	(Line 8 / Line 9)	\$ 0.734957	per kW

<sup>1</sup>Forecast retail kWh sales excludes E-3 and E-4 kWh.

<sup>2</sup>\$/kWh charge for all Residential customers and General Service customers with no demand charge.

<sup>3</sup>Forecast General Service kWh for customers with demand charges.

<sup>4</sup>\$/kW charge for General Service customers with demand charges.



**ADJUSTMENT SCHEDULE DSMAC-1  
DEMAND SIDE MANAGEMENT COST ADJUSTMENT**

APPLICATION

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RATE

The charge shall be calculated at the following rate:

For all residential customers and general service customers whose billing does not include demand charges:

| All kWh \$0.00~~06051680~~ per kWh

For general service customers whose billing includes demand charges:

| All metered kW \$0.~~273328734957~~ per kW



**ADJUSTMENT SCHEDULE DSMAC-1  
DEMAND SIDE MANAGEMENT COST ADJUSTMENT**

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APPLICATION

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For all residential customers and general service customers whose billing does not include demand charges:

All kWh	\$0.001680	per kWh
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For general service customers whose billing includes demand charges:

All metered kW	\$0.734957	per kW
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