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BEFORE THE ARIZONA CORPORATION COMMISSION

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Arizona Corporation Commission

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IN THE MATTER OF THE APPLICATION)
OF ARIZONA PUBLIC SERVICE)
COMPANY FOR APPROVAL OF THE)
COMPANY'S 2011 DEMAND SIDE)
MANAGEMENT IMPLEMENTATION)
PLAN)

DOCKET NO. E-01345A-10-0219
DECISION NO. 72060
ORDER

Open Meeting
December 14 and 15, 2010
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

Background

1. Arizona Public Service Company ("APS" or "the Company") provides electric service within portions of Arizona, pursuant to authority granted by the Arizona Corporation Commission ("Commission").

2. APS provides service in the counties of Apache, Cochise, Coconino, Gila, La Paz, Maricopa, Navajo, Pima, Pinal, Yavapai and Yuma. The Company services over 1.1 million customers in Arizona, including approximately 984,000 Residential and 120,000 Commercial customers.

3. On June 1, 2010, APS filed an application for approval of the Company's 2011 Demand Side Management Implementation Plan (the "2011 Plan"). The 2011 Plan filing was in

1 compliance with the provisions of the settlement agreement in the Company's most recent rate
2 case, as approved by the Arizona Corporation Commission in Decision No. 71448.

3 4. The proposed 2011 Plan reflects changes to the existing APS DSM portfolio, and
4 sets out the programs and measures by which APS plans to meet the energy savings goals agreed
5 upon in the Settlement Agreement.

6 *The APS DSM Implementation Plan Filings (June 1, June 30 and August 2, 2010)*

7 5. The first Implementation Plan filing, dated June 1, 2010, was followed by two
8 supplemental filings, on June 30, 2010¹ and on August 2, 2010. (The material filed on August 2nd
9 included material originally planned for the August 16th filing.) With respect to changes and
10 enhancements, the scope of each filing is as follows:

- 11 • June 1: Proposed Enhancements to Existing Residential and Non-
12 Residential Programs and one new Residential program (Conservation
13 Behavior Pilot Program); preliminary budget and preliminary Demand-Side
14 Management Adjustor Charge ("DSMAC") estimate;²
- 15 • June 30: Proposed New Prescriptive and Direct Install Measures for Non-
16 Residential Programs and the Bid for Efficiency Pilot;
- 17 • August 2: Proposed New Residential Shade Tree Pilot Program and New
18 Measures for the Existing Residential Homes Program; also, Proposed New
19 Residential Multi-Family Homes Program (originally planned for the
20 August 16 filing); final budget and DSMAC estimates.

21 6. *2011 APS Implementation Plan; Background.* The 2011 Plan is being addressed in
22 multiple parts. The initial order, docketed in October, primarily addressed the Conservation
23 Behavior Pilot Program, one of three new Residential behavior-based programs. On November 1,
24 2010, the Conservation Behavior Pilot program was approved by the Commission (Decision No.
25 71950). The Company's initial estimates regarding the budget, revenue requirement and DSMAC

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27 ¹ The First Supplemental filing was originally scheduled for July 1 (see the Application, page 7) but actually filed on
June 30th.

28 ² In addition, Filing 1 requested that costs associated with the Home Energy Information ("HEI") Pilot Program, along
marketing costs for certain rates, be recovered through the DSMAC.

1 were also discussed, but no recommendation or order was made regarding the DSMAC.³ On
2 November 23, 2010, the Commission also acted on the Company's proposals regarding three
3 existing Residential programs, the Consumer Products, Appliance Recycling, and Energy Wise
4 programs.

5 7. Scope of Review for this Order. The focus of this Order is the two remaining new
6 Residential programs and enhancements to one existing program: (i) the Multi-Family Energy
7 Efficiency Program (New); (ii) the Shade Tree Pilot Program (New); and (iii) the Residential
8 Existing Homes Heating, Ventilation and Air Conditioning Program (Existing).

9 8. New Residential Programs

10 (i) **Multi-Family Energy Efficiency Program;** APS is proposing a new
11 Residential program to target new and existing multi-family Residential
12 properties.

13 (ii) **Shade Tree Pilot Program;** APS is proposing a Residential Shade Tree
14 pilot program, in partnership with a local non-profit agency. The program
15 would provide desert-adapted trees free of charge, but would require
16 participation by customers in workshops focusing on planting to maximize
17 energy savings and maintenance of the trees.

18 Existing Residential Program

19 (iii) **Existing Homes Program;** APS proposes to add a measure to the existing
20 Residential Existing Homes Heating, Ventilation and Air Conditioning
21 program ("R-HVAC"). The measure provides a financial incentive to APS
22 Residential customers to have an advanced diagnostic tune-up on their air
23 conditioning or heat pump unit.⁴ The program also proposes to provide an
24 incentive payment to contractors who purchase advanced diagnostic
25 equipment.

26 ³ The actual DSMAC will be addressed in the final order relating to the 2011 Plan, so that any Commission-ordered
27 modifications or changes can be taken into account when the adjustor rate is reset.

28 ⁴ As indicated in the June 1 filing, APS originally planned to propose a Room Pressure Balancing measure to Existing
Homes (a.k.a., "R-HVAC"). However, a final review of the measure indicated that the measure was not cost-effective
and APS did not file for Commission approval of the measure.

1 9. Proposed Recovery of Costs for Demand Response and Home Energy Information
2 Pilot Program. APS is also requesting recovery of the costs associated with the Home Energy
3 Information Pilot Program, along with marketing costs for certain rates, through the DSMAC.⁵
4 Because these requests relate to the type and amount of funding to be recovered through the
5 DSMAC, these will be covered in the final order as part of the adjustor reset.

6 10. Scope of Review: Cost-Effectiveness. Measures previously determined by Staff to
7 be cost-effective will not be re-evaluated for cost-effectiveness at this time, unless new
8 information indicates that re-evaluation is necessary.

9 **New Residential Programs**

10 **Multi-Family Energy Efficiency Program**

11 11. Description. The Multi-Family Energy Efficiency Program (“Multi-Family”),
12 would promote energy efficiency in existing multi-family properties with more than five⁶ units,
13 including dormitories. The program focuses on the construction of new energy efficient multi-
14 family housing, and the renovation or retrofit of existing multi-family units.

15 12. Multi-Family Housing: Barriers to Energy Efficiency. APS notes that, while
16 approximately 23% of its customers live in multi-family housing, there are significant barriers to
17 reaching this customer segment with energy efficiency programs. The builders who construct
18 rental properties, and the owners who would be responsible for upgrades, do not usually pay the
19 energy bills. Consequently, builders and owners do not directly benefit from the lower energy
20 costs that arise from investing in efficiency measures, which reduces or eliminates their incentive
21 to participate in DSM programs. At the same time, the renters who would benefit from lower
22 energy bills have no direct influence over original construction and, with respect to renovations or
23 retrofits, may not have the authority, the incentive or the means to invest in energy efficiency for
24 housing they do not own.

25 13. APS seeks to promote energy efficiency and address existing barriers to
26 participation through the following three program components: (i) Direct Install; (ii) Common

27 ⁵ Critical Peak Pricing, Residential Super Peak Rate, Time of Use Rate, and the Interruptible Rate.

28 ⁶ Properties with more than five units usually fall under commercial lending guidelines, and the decision-makers are usually, corporate, institutional or trusts.

1 Area Retrofits; and (iii) New Construction/Renovation/Retrofits. These components are described
2 in more detail below.

3 14. Direct Install. Direct Install provides the following low cost direct install measures
4 to multi-family rental property management companies: (a) CFLs, (b) low flow showerheads, and
5 (c) faucet aerators. The APS implementation contractor would provide guidance and monitoring,
6 while property managers would be responsible for any costs and labor related to installation. In
7 discussions with Staff, APS stated that owners of large multi-family housing properties have
8 indicated that they would be willing to participate in the Direct Install component, based on the
9 potential marketing benefits of such participation. Additional detail regarding the Direct Install
10 measures is provided in the table below.

Measure	Incremental Cost	Incentive
Direct Install CFLs	\$2.00	Provided free of charge to participant. Participant responsible for installation cost.
Direct Install Showerheads	\$52.00/\$31.00	Provided free of charge to participant. Participant responsible for installation cost.
Direct Install Faucet Aerators	\$7.60	Provided free of charge to participant. Participant responsible for installation cost.

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17 15. Cost-effectiveness of the Showerhead Measure As Part of the Multi-Family
18 Program. Low-flow showerheads were previously approved by the Commission. Staff performed
19 an analysis on the showerhead measure using an updated incremental cost for the measure and the
20 program costs specific to the Multi-Family program. The benefit-cost ratio for the showerhead
21 measure is 1.13, making the measure cost-effective on a projected basis.⁷

22 16. In communications with Staff, APS noted that the model selected for the Multi-
23 Family program interrupts the flow once the water is heated up, and reduces water usage as well as
24 saving energy. The Company also noted that property managers were reluctant to install lower-
25 end showerheads, due to potential maintenance problems, and that the model selected for the
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27 ⁷ A "smart" showerhead natural gas measure with the flow-interrupt feature was approved for the Southwest Gas
28 Consumer Products program as a pilot (Decision No. 71289, 10/7/2009). Southwest Gas, in communication with
Staff, indicated that it will review data from the pilot and file a report on the measure's cost-effectiveness by
12/30/2010.

1 Multi-Family program is a better design for the Arizona market, being easy to de-calcify and
2 manufactured with better brass components. Review by Staff and the Company also indicated that
3 the price of this item has decreased significantly. (The on-line price of the measure is now
4 \$30.99.) Staff noted that the decreased cost improved the measure's cost-effectiveness.

5 17. Common Area Retrofits. Common Area Retrofits would leverage on-site work
6 done in connection with the Direct Install component, beginning with an assessment of common
7 areas such as community rooms, offices, pools, and laundry facilities. Unlike the energy costs for
8 individual units, the energy costs associated with common areas are usually paid by owners,
9 meaning that there is a built-in incentive for owners to participate in this component of the
10 proposed Multi-Family program.

11 18. The Common Area Retrofit assessment would identify potential energy efficiency
12 savings, and would be followed by referrals to the APS Solutions for Business program. ("APS
13 Solutions for Business" is an umbrella term used for the Company's Non-Residential programs.)
14 The Common Area Retrofit assessment would be paid for by APS Solutions for Business, which
15 would also track the savings from any installations done as part of the Multi-Family program's
16 Common Area Retrofit component.

17 19. New Construction/Renovation/Retrofit. New Construction/Renovation/Retrofit
18 would provide incentives to builders for construction of more energy efficient multi-family
19 housing, for existing multi-family properties undergoing major renovations, and for existing multi-
20 family properties undergoing energy efficiency retrofits. The incentives would be provided on a
21 per-unit basis to builders meeting the program's prescriptive energy efficiency standards.

22 20. The New Construction/Renovation/Retrofit component of the Multi-family program
23 offers four Builder Option Packages ("BOPs"), discussed below. BOP 1, 2 and 3 apply to either
24 new construction or major renovation projects (such as those requiring structural changes), while
25 the retrofit program is designed for less major, non-structural, energy efficiency upgrades.
26 Additional detail is provided below.

27 21. Builder Options; Incentives. The table below lists the incentives for each BOP, the
28 customer incremental cost per unit, incentives as a percentage of the customer's incremental cost,

1 and the measures required for each builder option. (The customer incremental cost per unit listed
 2 in the table represents the customer's full incremental cost per unit, without taking into account the
 3 proposed incentive.)

			Builder Option Package 1
Incentive per unit	Customer Incremental Cost Per Unit	Incentive as a Percentage of the Incremental Cost	Measures
\$650	\$902.95	72%	<ul style="list-style-type: none"> • Wall Insulation • Window U-Factor • Window Solar Heat Gain Coefficient • Reduced Infiltration Rates • Reduced Duct Leakage • Higher Air Conditioning Efficiency (14 SEER minimum) • Higher Furnace Efficiency (where applicable) • Higher Heat Pump Heating Efficiency (where applicable) • Reduced Lighting Power Density • Reduced Miscellaneous Appliance Power Density • Higher Water Heating Efficiency
			Builder Option Package 2
\$800	\$1,186.50	67%	All of the BOP1 measures PLUS: <ul style="list-style-type: none"> • Significant Additional Reduction to Lighting Power Density
			Builder Option Package 3
\$900	\$1,366.60	66%	All of the BOP1 measures PLUS: <ul style="list-style-type: none"> • Duct Leakage Reduced to 0% (ducts inside the conditioned space) • Higher Air Conditioner ("AC") Efficiency (15 SEER minimum)
			Retrofit Builder Option Package 4
\$650	\$896.37	73%	<ul style="list-style-type: none"> • Reduced Duct Leakage • Higher AC Efficiency (14 SEER minimum) • Higher Furnace Efficiency (where applicable) • Higher Heat Pump Heating Efficiency (where applicable) • Reduced Lighting Power Density • Miscellaneous Appliance Power Density • Higher Hot Water Heating Efficiency

22. Proposed Budget. The Multi-Family budget covers costs for dwelling audits, costs
 24 for handling, warehousing and shipping components, technical and field support, follow-up
 25 verifications, working with manufacturers, and tracking and reporting performance. The proposed
 26 budget is shown in the table below:

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Program	Multi-Family
Rebates and Incentives	\$590,000
Training and Technical Assistance	\$10,000
Consumer Education	\$25,000
Program Implementation ⁸	\$555,000
Program Marketing	\$62,000
Planning and Administration ⁹	\$35,000
Financing	\$0
Program Total Cost	\$1,277,000

23. Cost-Effectiveness. The Multi-Family program will rely on measures already found cost-effective by the Commission. Because the Multi-Family program is not only a new program, but also features a new delivery model, Staff reviewed the benefit-cost ratio to confirm that cost-effectiveness would be maintained. Staff's review indicated a benefit-cost ratio for the Direct Install component of 1.73, and 1.07 for the Builder Option Packages component, indicating that, based on projected benefits and costs, the Multi-Family program is cost-effective. (As noted elsewhere, herein, costs and savings associated with the Common Area Retrofit component, other than the cost of the audit, will not be tracked within the Multi-Family program but, instead, will be tracked with existing Non-residential programs, as part of "APS Solutions for Business.")

24. Environmental Savings. The estimated environmental savings for the Multi-Family program are listed in the table below:

Projected Lifetime Savings for Measures Installed in 2011	Quantities
Water Savings	11,000,000 Gallons
SOx	160 Lbs.
NOx	3,044 Lbs.
CO2	32,000,000 Lbs.
PM10	889 Lbs.

25. Bill Impact. The proposed budget for the Multi-Family program is \$1,277,000. Based on this budget and on average usage by Residential customers, the monthly bill impact of

⁸ Implementation includes costs associated with program delivery, including Program Outreach, Field Assessments, Direct Install Program Component Logistics, Direct Install Component Handling, Technical/Field Support, Component Verification Follow-up and Reporting and Tracking.

⁹ Planning and Administration includes the Company's costs to plan, develop and administer programs, including management of program budgets, oversight of the RFP process and implementation contract, program development, program coordination and general overhead expenses.

1 this program would be approximately 5.4 cents. The annual impact would be approximately 65
2 cents.

3 26. Recommendation. The Multi-Family program is cost-effective, as designed, and
4 has the potential to promote energy efficiency in a sector of the customer community that has been
5 difficult to reach with DSM programs. Staff has recommended that the Multi-Family program be
6 approved.

7 27. Reporting. The status of the program, including data on whether it is cost-effective,
8 should be reported in semi-annual reports, or in any succeeding form of report ordered by the
9 Commission. Information reported should include, but not be limited to, the types of information
10 and data currently covered in the current semi-annual reports for existing programs. Staff has also
11 recommended that the semi-annual reports, or any succeeding form of DSM report ordered by the
12 Commission, include detailed information regarding the Implementation costs for the Multi-
13 Family program, including information on: (i) the program-specific costs included in the
14 Implementation category; (ii) how much Implementation funding is retained by APS; and (ii) how
15 much Implementation funding is paid to outside contractors.

16 28. Additional Recommendation. Most Arizona apartment complexes are electric-only,
17 and APS has indicated that it does not anticipate that it will encounter many instances where a gas
18 appliance, such as a water heater, could be replaced by an electric appliance. In order to limit fuel
19 switching issues, and due to concerns over the efficiency of replacing gas water heaters with
20 electric water heaters, Staff has also recommended that the Multi-Family program not be used to
21 replace gas appliances with electric appliances.

22 Shade Tree Pilot Program

23 29. Description. APS is proposing a Shade Tree program, which it plans to implement
24 as a pilot in partnership with the Permaculture Guild, a local non-profit agency. APS proposes to
25 offer workshops on planting and maintaining trees, and will provide APS customers attending the
26 workshops with vouchers for up to three desert-adapted trees. The APS Shade Tree program has
27 been designed to focus heavily on education, in order to limit tree mortality and enhance savings.

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1 30. The program would commence within six to eight weeks of receiving Commission
2 approval, with measurement, evaluation and research ("MER") being conducted on an ongoing
3 basis. At the conclusion of a twelve-month pilot APS will submit a MER report to the
4 Commission, with suggestion on program redesign or expansion.

5 31. Eligibility and Participation. APS customers in single-family residential homes
6 will be eligible to participate in the program. APS estimates that 5,000 trees would be planted
7 during the pilot program.

8 32. Delivery and Incentives. In lieu of a monetary investment by program
9 participants¹⁰, the APS Shade Tree program would require participants to take part in workshops,
10 (between half an hour and an hour long) designed to educate customers about the energy savings
11 potential for shade trees, and on how to plant and care for the trees. APS customers would also be
12 responsible for picking up their trees at specific "tree pickup events," as well as being responsible
13 for planting and maintaining the trees.

14 33. Workshops. Although tree pickup events will be limited to the appropriate planting
15 seasons, tree workshops will be offered year-round. The workshop curriculum is described in
16 more detail, below.

17 34. Selecting desert-adapted shade trees: Trees should require low water-use and offer
18 sufficient canopy size and density for shade. (The proposed APS program will be restricted to
19 only Mesquite and Palo Verde trees, but the workshops will train on tree-selection to promote the
20 selection of appropriate desert-adapted shade trees in the future);

- 21 • *Planting techniques:* Customers will learn how to plant trees to maximize
22 survivability;
- 23 • *Planting locations:* Program requirements are that the shade trees be
24 planted on the south, west and east sides, and within 15 feet, of customers'
25 homes. Customers will also be taught to plant in front of windows and

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27 ¹⁰ In comparison, the TEP Shade Tree program (in existence since 1992) charges \$8.00 per tree, and delivers the trees.
28 Under the UNS Electric program, customers purchase the trees on a retail basis and receive a \$15.00 bill credit (for trees costing approximately \$20.00).

1 away from patios and major overhangs, as well as learning how to plant
2 away from power lines and underground utilities;

- 3 • *Tree maintenance*: Customers will be taught to prune and water trees to
4 encourage growth and health, without wasting water; and
- 5 • *Fire control*: Customers will learn how to trim trees and shrubs and how to
6 safely dispose of the trimmings to minimize fire hazards.

7 35. Participants receive a voucher for two five-gallon desert-adapted trees, unless they
8 live in a home built prior to 1980. Participants living in these older, and generally less energy
9 efficient homes, would receive up to three vouchers.

10 36. Western Resource Advocates ("WRA") and Sierra Club Comments: The Sierra
11 Club filed comments supporting the proposed Shade Tree pilot as cost-effective, and for the
12 additional environmental benefits that the program would provide to the Phoenix area. The WRA
13 also filed comments in support of the proposed pilot, recommending that the list of eligible tree
14 species be expanded to offer more choices, and recommending that, following the pilot, APS make
15 any appropriate modifications and expand the scale of the program.

16 37. Eligible Trees and Program Expansion. APS currently plans to offer vouchers for
17 only Mesquite and Palo Verde trees. Staff has recommended that APS be allowed to offer
18 additional types of desert-adapted shade trees if the cost-effectiveness of the Shade Tree program
19 is maintained while doing so. Staff has also recommended that APS submit appropriate plans to
20 expand the Shade Tree program as part of its MER report following the pilot, if the pilot program
21 is determined to be cost-effective.

22 38. Proposed Budget. As stated herein, rebates and incentives are not directly paid to
23 program participants. The \$50,000 listed for rebates and incentives covers the cost of the trees
24 provided under the program. In discussions with Staff, APS indicated that purchasing the program
25 trees in bulk and directly from the grower resulted in higher quality trees and lower tree mortality.
26 With respect to Implementation, \$200,000 of the \$244,000 cost would be paid to the Permaculture
27 Guild to cover training and pickup events, while \$44,000 would cover the Company's internal
28 labor, and covers the cost of a half-time program coordinator. The Training and Technical

1 Assistance and Consumer Education categories cover education and educational materials for
 2 customers, while the Marketing costs would cover items such as bill inserts. Planning and
 3 Administration includes the Company's overhead and planning costs.

4 39. The proposed budget for the Shade Tree Pilot Program is set out in the table below:

Program	Shade Tree
Rebates and Incentives	\$50,000
Training and Technical Assistance	\$45,000
Consumer Education	\$25,000
Program Implementation	\$244,000
Program Marketing	\$55,000
Planning and Administration	\$25,000
Financing	\$0
Program Total Cost	\$444,000

11 40. Incentive and Non-Incentive Costs. Staff expressed concern about implementation
 12 costs being high, relative to costs for rebates and incentive. In communication with Staff, APS
 13 explained that its proposed Shade Tree pilot is weighted toward implementation costs due to the
 14 program's:

15 "emphasis on the community education component. The APS Shade Tree
 16 Pilot Program utilizes a model that offers home owners. . .workshops on
 17 how to plant, locate, and maintain shade trees. APS believes that this
 18 model will optimize tree placement and decrease tree mortality rates. . ."
 19 [The Company believes that its approach will] "optimize the energy
 20 saving potential of each tree . . .while at the same time promoting the
 21 importance of energy efficiency as a whole."

20 41. APS also noted that the pilot will include an evaluation of its delivery methodology
 21 and will compare that methodology with other Shade Tree programs in Arizona.

22 42. Tree mortality or planting trees outside program parameters could significantly
 23 impact savings from shade tree programs, but a reasonable balance should be maintained between
 24 non-incentive and incentive costs. (In this case, incentive costs are not costs paid directly to
 25 participants but, instead, represent the cost of the trees supplied to participants.)

26 43. Staff has recommended that the pilot program's MER report include, but not be
 27 limited to: (i) the impact of the workshops on program participation; (ii) the impact of the
 28 workshops on compliance with the program's requirements for planting parameters; and (iii) the

1 impact of the workshops on energy savings and cost-effectiveness. In particular, the MER report
 2 should include data regarding whether the mandatory workshops improve mortality and enhance
 3 savings sufficiently to justify this program design, or whether a larger portion of the program
 4 funding should be shifted from workshops into the rebates and incentives category, in order to
 5 provide more trees.

6 44. Cost-Effectiveness. In addition to providing other societal benefits, as discussed
 7 herein, shade trees conserve energy in the following ways:

- 8 • Shading reduces the radiant energy absorbed and stored by surfaces,
 9 including walls, pavement and gravel yards;
- 10 • Transpiration, which converts liquid water in leaves into vapor, thereby
 11 cooling the air; and
- 12 • Trees reduce wind velocity and slow the infiltration of outside air into inside
 13 spaces.

14 45. Staff estimates the benefit-cost ratio of the proposed APS Residential Shade Tree
 15 Pilot program at approximately 1.15, making the program (as designed) cost-effective. The
 16 environmental savings and other program benefits are also discussed herein.

17 46. Environmental Savings. The estimated environmental savings for the Shade Tree
 18 program are listed in the table below:

Projected Lifetime Savings for Measures Installed in 2011	Quantities
Water Savings	6,000,000 Gallons
SOx	86 Lbs.
NOx	1,632 Lbs.
CO2	17,000,000 Lbs.
PM10	477 Lbs.

24 47. Additional Benefits. In addition to the kWh and air emissions savings, the
 25 following benefits arise from the program. While these benefits are not monetized, they are part of
 26 the overall benefits of the Shade Tree program. Shade trees:

- 27 • provide habitat for wildlife;
- 28 • absorb air and water pollution;

- 1 • control stormwater runoff;
- 2 • control soil erosion and wind; and
- 3 • provide aesthetic benefits.

4 48. Reporting. The status of the program should be reported in semi-annual reports, or
5 in any succeeding form of report ordered by the Commission. Information reported should
6 include, but not be limited to, the types of information and data currently covered in the current
7 semi-annual reports for existing programs. Staff has also recommended that the semi-annual
8 reports, or any succeeding form of DSM report ordered by the Commission, include detailed
9 information regarding the Implementation costs for the Shade Tree program, including information
10 on: (i) the program-specific costs included in the Implementation category; (ii) how much
11 Implementation funding is retained by APS; and (iii) how much Implementation funding is paid to
12 outside contractors.

13 49. Bill Impact. The proposed total budget for the Shade Tree Pilot Program is
14 \$444,000. Based on this budget, and on average usage by Residential customers, the monthly bill
15 impact of this program would be approximately 1.9 cents. The annual impact would be
16 approximately 23 cents.

17 50. Recommendations. Staff has recommended that the APS Residential Shade Tree
18 Pilot Program be approved, as modified herein. Staff has recommended that the program continue
19 during the period that the data from the first twelve months are being evaluated.

20 Existing Residential Program

21 Existing Homes

22 51. Description of Existing Program. The Residential Existing Homes Heating,
23 Ventilation and Air Conditioning ("R-HVAC") program consists of: (i) Residential HVAC,
24 including air conditioning rebates and Duct Test and Repair; and (ii) Home Performance with
25 Energy Star ("HPwES"). R-HVAC promotes energy efficient equipment and a Quality Installation
26 measure designed to maximize HVAC operating efficiency. HPwES¹¹ promotes a whole house
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28 ¹¹ The HPwES program component was approved by the Commission in Decision No. 71460, on January 26, 2010.

1 approach to energy efficiency, beginning with a \$99 comprehensive home energy assessment.
 2 HPwES identifies potential energy efficiency measures, such as air sealing, insulation, shade
 3 screens, faucet aerators, and low flow showerheads, and provides homeowners with information
 4 on APS energy efficiency rebates and access to financing.

5 52. Description of Proposed Changes. APS is proposing to add an advanced diagnostic
 6 air conditioning tune-up measure to the R-HVAC program. The measure provides a financial
 7 incentive to APS Residential customers to have an advanced diagnostic tune-up on their air
 8 conditioning or heat pump unit, and an incentive to participating contractors to offset the cost of
 9 equipment required to perform the tune-up.

10 53. Advanced Diagnostic Tune-up: Normal diagnostic tune-ups vary in the types of
 11 service provided and may be as limited as a visual inspection that does not include an actual tune-
 12 up, and does not provide verification of what work has been done. The advanced diagnostic tune-
 13 up provides the following services:

Number	Service
1.	Checking thermostat operation;
2.	Cleaning or replacement of filter (customer supplied);
3.	Verification of air flow with advanced diagnostic equipment or flow hood;
4.	Checking for refrigerant leaks and repair of leaks;
5.	Verification of refrigerant charge with advanced diagnostic equipment and correction, if needed;
6.	Cleaning of outdoor condenser coil;
7.	Inspection of fused disconnect;
8.	Inspection of wiring and tightening of electrical connections;
9.	Inspection of contactors, relays, and pressure controls;
10.	Inspection of electrical safety circuits;
11.	Checking voltage and amperage to all motors;
12.	Inspection and cleaning of indoor blower wheel and motor for dirt build-up;
13.	Inspection of bearings and lubrication of all moving parts, as required;
14.	Inspection of belt and adjustment of tension, as required;
15.	Inspection and cleaning of condensate drain;
16.	Inspection of duct seal at unit and securing of panels;
17.	Checking evaporative cooler duct block-off, as required; and
18.	Explaining and documenting all necessary repairs.

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26 54. APS states that most tune-ups are primarily visual inspections, and that it is rare for
 27 technicians to test the refrigeration system to verify the charge, check the airflow, clean the
 28 condenser coil, or verify the work that was done. The APS measure requires all four main

1 components of an advanced diagnostic tune-up, as well as requiring that pre-tune-up and post-
2 tune-up performance data be recorded for verification purposes.

3 55. Eligibility. The Residential Diagnostic Measure targets APS Residential customers
4 in existing single family homes, with heating and cooling equipment that is at least three years old.
5 The units may be package or split systems and must be two to five tons in size and connected to a
6 duct system. Tune-ups can not be performed more often than every three years, as the Company
7 does not believe that more frequent tune-ups would be beneficial.

8 56. Participation. In the first year, APS plans to limit participation to 5,300
9 participants, to verify the measure's performance in the field. If the program meets requirements,
10 APS anticipates annual participation in the range of 10,000 to 50,000. Units on multi-family
11 homes are eligible to participate in cases where there is a Residential account.

12 57. Residential Incentive. The proposed incentive for the new Diagnostic measure is
13 \$100, to offset the cost of an advanced diagnostic and tune-up of a customer's heat pump or air
14 conditioner. The cost of these services generally runs from \$150-\$180, meaning that the incentive
15 would equal from 67% to 55% of the measure cost.

16 58. Contractor Incentive. The Company also proposes to offer a contractor equipment
17 incentive of \$1,000 to companies purchasing advanced diagnostic equipment, to offset the \$3,600
18 cost of the equipment. Based on discussions with APS, the "Stargate" (or equivalent) device is
19 considered integral to the proposed measure and would be used to verify that the work required for
20 the tune-up had been performed.¹² Contractors would be limited to two \$1,000 equipment
21 incentives per company, and are eligible for the incentives only once they have completed "20
22 advanced diagnostic jobs that have been verified and accepted by APS." Contractors must
23 undergo training on advanced diagnostic equipment, and be current participants in the APS R-
24 HVAC program, before they can offer the Diagnostic measure to customers.

25 59. Initial Limitation on Contactor Participation. Only 40 contractors are allowed to
26 participate in the program during the first phase, which would begin in the spring of 2011 and

27
28 ¹² A Stargate site states: "The SG3000 analyzer is designed to be used on residential capillary tube and TXV values (Thermostatic Expansion Value) air conditioning refrigeration systems that use refrigerants. . . The SG3000 analyzer can also be used as a service tool to read pressure and temperature values."

1 continues until 5,300 Diagnostic rebates have been paid. Once the first phase is complete, the
2 Diagnostic measure will be evaluated to determine if it is cost-effective. APS is limiting
3 participation during the first phase because it “ensures that the initial 40 contractors will have the
4 opportunity to secure enough jobs to cover the initial expense of participating in this measure.”

5 60. Issues Regarding the “Stargate” (or Equivalent) Device. Staff has concerns with
6 respect to the “Stargate” (or equivalent) incentive proposed in connection with the Diagnostic
7 measures. First, within the context of a DSM program, incentives are normally offered directly in
8 connection with measures that have been found to be cost-effective. In the R-HVAC program
9 proposal, the “Stargate” (or equivalent) device is not treated as a measure, and there is insufficient
10 information to show that this device would increase energy savings enough to justify the
11 associated costs. Other concerns are: (i) there is insufficient information to support a conclusion
12 that a \$1,000 incentive is necessary to promote participation by contractors; (ii) there are no
13 overall limits on the number of incentives that would be paid for the “Stargate” (or equivalent)
14 device once the first phase of the roll-out is completed and evaluated, meaning that the overall cost
15 of providing the incentive during full rollout of the program is unknown¹³; and (iii) although APS
16 customers would be paying the cost of the incentives, the “Stargate” or equivalent devices could be
17 used outside the Company’s service territory, particularly as the program expands.

18 61. Budget Background. The original budget approved for the R-HVAC program in
19 early 2010 was \$5,907,000. On September 27, 2010, APS filed an application for approval of an
20 increase in the 2010 Energy Efficiency Implementation Plan Funds, with respect to the R-HVAC
21 program. An increase of \$3,000,000 was requested for the program, in order to accommodate
22 unexpectedly high levels of customer demand, and to avoid suspension of the program once
23 funding was exhausted (estimated to occur in late 2010). In addition to the budget increase, funds
24 were transferred from less active Residential programs. On November 8, 2010, in Decision No.
25 71960, the increase in budget was approved, and the Commission ordered that transfers among all

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27
28 ¹³ \$29,000 in contractor incentives are projected for first phase of the rollout. Staff notes that, because this is a
program cost, as it increases, measure costs also increase, negatively impacting cost-effectiveness.

1 the Residential programs be allowed (with the exception of the Low-income Weatherization
2 program) to permit more efficient allocation of Residential DSM funds.

3 62. Proposed Budget. The 2010 and proposed 2011 budgets are shown in the table
4 below. The Company estimates that the proposed new Diagnostic measure would cost \$1,089,000,
5 bringing the total budget to \$14,812,000.

6 Program	7 Initial 2010 Existing Homes ("R-HVAC")	2010 Budget Following Increase	2011 Budget Existing Homes
8 Rebates and Incentives	\$3,519,000	\$6,875,000	\$9,715,000
9 Training and Technical Assistance	\$88,000	\$220,000	\$334,000
10 Consumer Education	\$279,000	\$229,000	\$365,000
11 Program Implementation	\$1,200,000	\$1,808,000	\$3,129,000
12 Program Marketing	\$598,000	\$473,000	\$807,000
13 Planning and Administration	\$223,000	\$102,000	\$257,000
14 Financing	\$0	\$0	\$205,000
15 Program Total Cost	\$5,907,000	\$9,707,000 ¹⁴	\$14,812,000

16 63. Cost-Effectiveness of the R-HVAC Program. The R-HVAC program was
17 previously determined to be cost-effective, and the program's overall cost-effectiveness has not
18 been reviewed for this filing.

19 64. Cost-Effectiveness of the Proposed Diagnostic Measure. Staff estimated the
20 benefit-cost ratio of the proposed new Diagnostic measure at 0.976, putting the benefit-cost ratio at
21 just under 1.0. However, this level of cost-effectiveness would be achieved only if the projected
22 lifespan and related energy savings are realized, and the lifespan of the Diagnostic measure is
23 uncertain.

24 65. Impact of Lifespan. The lifespan of a measure equals the number of years that it
25 produces energy savings and, for this reason, it has a major role in determining a measure's overall
26 energy savings and cost-effectiveness. The impact on cost-effectiveness is particularly significant
27

28 ¹⁴ Includes both the Commission-approved \$3,000,000 increase in funding and transfers from other, less-active, Residential programs.

1 for measures, such as the proposed Diagnostic measure, with relatively low energy savings
 2 compared to the program and incremental costs. As an example, should the lifespan of the
 3 Diagnostic measure drop to five years, the benefit-cost ratio drops to 0.689, well below the level
 4 required for cost-effectiveness.

5 66. Although the Company cites DEER data supporting a ten-year lifespan for a
 6 refrigerant charge measure (which is only one of 18 services required as part of the proposed
 7 Diagnostic measure), that is insufficient to support the six-year lifespan cited for the Diagnostic
 8 measure as a whole. Another issue, in addition to the general lack of data, is that a number of the
 9 18 listed services required for the proposed Diagnostic measure (such as cleaning evaporator and
 10 condenser air conditioning coils, and lubricating moving parts) would need to be done *annually*,
 11 not every six years (see the Energy Star recommended Maintenance Checklist).

12 67. There is insufficient information to support a conclusion that this measure, as
 13 currently proposed, would be cost-effective.

14 68. Environmental Savings. The estimated environmental savings for the R-HVAC
 15 program as a whole are listed in the table below:

Projected Lifetime Savings for Measures Installed in 2011	Quantities (Entire Program)
Water Savings	81,000,000 Gallons
SOx	1,139 Lbs.
NOx	21,645 Lbs.
CO2	230,000,000 Lbs.
PM10	6,323 Lbs.

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 21 69. The estimated environmental savings for the Diagnostic measure alone are listed in
 22 the table below:

Projected Lifetime Savings for Measures Installed in 2011	Quantities (Entire Program)
Water Savings	6,000,000 Gallons
SOx	85 Lbs.
NOx	1,614 Lbs.
CO2	3,000,000 Lbs.

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 27 70. Reporting. The status of the existing R-HVAC program should continue to be
 28 reported in semi-annual reports, or in any succeeding form of report ordered by the Commission.

1 Information reported should include, but not be limited to, the types of information and data
2 currently covered in the current semi-annual reports. Staff has also recommended that the semi-
3 annual reports, or any succeeding form of DSM report ordered by the Commission, include
4 detailed information regarding the Implementation costs for the R-HVAC program, including
5 information on: (i) the program-specific costs included in the Implementation category; (ii) how
6 much Implementation funding is retained by APS; and (ii) how much Implementation funding is
7 paid to outside contractors.

8 71. Bill Impact. The proposed budget for the total R-HVAC program, with the
9 proposed new Diagnostic measure, is \$14,812,000. Based on this budget, and on average usage by
10 Residential customers, the monthly bill impact of this program would be approximately \$0.63.
11 The annual impact would be approximately \$7.54. For the proposed R-HVAC Diagnostic
12 measure, by itself, the monthly bill impact for Residential customers would be approximately 4.6
13 cents, while the approximate annual cost would be 55 cents.

14 72. Without the Diagnostic measure, the total R-HVAC budget would be \$13,723,000.
15 Based on this budget and on average usage by Residential customers, the monthly bill impact of
16 this program would be approximately \$0.58. The annual impact would be approximately \$6.98.

17 73. Recommendations. In discussions with Staff, APS has expressed the willingness to
18 treat the proposed Diagnostic measure as a pilot. Staff is concerned, however, that even in pilot
19 form, there are serious questions about the measure's cost-effectiveness and the proposed
20 contractor incentive.

21 74. Given the Diagnostic measure's doubtful cost-effectiveness, and the issues with the
22 contractor incentive for the "Stargate" (or equivalent) device, Staff recommends against approval
23 of the Diagnostic measure at this time.

24 Summary of Recommendations

- 25 • Staff has recommended that the Multi-Family Energy Efficiency Program be
26 approved.
- 27 • Staff has also recommended that the Multi-Family program not be used to replace
28 gas appliances with electric appliances.

- 1 • Staff has recommended that the APS Residential Shade Tree Pilot Program be
2 approved as a twelve-month pilot, and evaluated to ensure that, in practice, it is
3 cost-effective and should be continued.
- 4 • Staff has recommended that APS be allowed to offer additional types of desert-
5 adapted shade trees, if the cost-effectiveness of the Shade Tree program can be
6 maintained while doing so.
- 7 • Staff has also recommended that APS submit appropriate plans to expand the Shade
8 Tree program as part of its measurement, evaluation and research report following
9 the pilot program, if the pilot program is determined to be cost-effective.
- 10 • Staff has recommended that the APS Residential Shade Tree Pilot Program
11 continue during the period that the data from the first twelve months are being
12 evaluated.
- 13 • Staff has recommended that the pilot program's measurement, evaluation and
14 research report include, but not be limited to: (i) the impact of the workshops on
15 program participation; (ii) the impact of the workshops on compliance with the
16 program's requirements for planting; and (iii) the impact of the workshops on
17 energy savings and cost-effectiveness. In particular, the measurement, evaluation
18 and research report should include data regarding whether the mandatory
19 workshops improve mortality and enhance savings sufficiently to justify the pilot's
20 program design, or whether a larger portion of the program funding should be
21 shifted from workshops into the rebates and incentives category, in order to provide
22 more trees.
- 23 • Staff has recommended that the semi-annual reports, or any succeeding form of
24 DSM report ordered by the Commission, include detailed information regarding the
25 Implementation costs for each program, including information on what program-
26 specific costs are included in the Implementation category for that program and, for
27 each program, how much Implementation funding is retained by APS and how
28 much is paid to outside contractors.

1 IT IS FURTHER ORDERED that the APS Residential Shade Tree Pilot Program be
2 approved, as modified herein, as a twelve-month pilot, and evaluated to ensure that, in practice, it
3 is cost-effective and should be continued.

4 IT IS FURTHER ORDERED that APS be allowed to offer additional types of desert-
5 adapted trees as part of the APS Residential Shade Tree Pilot Program, if the cost-effectiveness of
6 the program can be maintained while doing so.

7 IT IS FURTHER ORDERED that APS submit appropriate plans to expand the APS
8 Residential Shade Tree Pilot Program as part of its measurement, evaluation and research report
9 following the pilot program, if the pilot program is determined to be cost-effective.

10 IT IS FURTHER ORDERED that the APS Residential Shade Tree Pilot Program continue
11 during the period that the data from the first twelve months are being evaluated.

12 IT IS FURTHER ORDERED that the pilot program's measurement, evaluation and
13 research report include, but not be limited to: (i) the impact of the workshops on program
14 participation; (ii) the impact of the workshops on compliance with the program's requirements for
15 planting; and (iii) the impact of the workshops on energy savings and cost-effectiveness. In
16 particular, the measurement, evaluation and research report should include data regarding whether
17 the mandatory workshops improve mortality and enhance savings sufficiently to justify the pilot's
18 program design, or whether a larger portion of the program funding should be shifted from
19 workshops into the rebates and incentives category, in order to provide more trees.

20 IT IS FURTHER ORDERED that the Residential Diagnostic measure proposed for
21 inclusion in the Residential Existing Homes Heating, Ventilation and Air Conditioning program be
22 approved as a pilot, and be evaluated through actual measurement and verification to ensure that,
23 in practice, it is cost effective and should be continued.

24 IT IS FURTHER ORDERED that the Residential HVAC Diagnostic measure be continued
25 until further Order of the Commission, unless found through the measurement and verification
26 process to be not cost effective, in which case it should be given an opportunity to be modified or
27 terminated as soon as practical.

28 ...

1 IT IS FURTHER ORDERED that Arizona Public Service Company shall develop an
2 integrated renewables and energy efficiency pilot program, focused on a bounded territory whether
3 a feeder, city block or otherwise. Such a program shall build on Arizona Public Service
4 Company's Community Power Project but fully integrate energy efficiency programs into the
5 proposal. The Company shall file such a program in its 2012 implementation plans or no later than
6 July 1, 2011.

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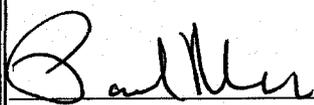
1 IT IS FURTHER ORDERED that the semi-annual reports, or any succeeding form of DSM
 2 report ordered by the Commission, include detailed information regarding the Implementation
 3 budget for each program, including information on the program-specific costs included in the
 4 Implementation budget category for that program and, for each program, how much
 5 Implementation funding is retained by APS and how much is paid to outside contractors.

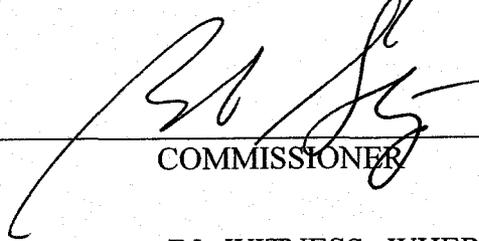
6 IT IS FURTHER ORDERED that this Decision shall become effective immediately.

7
 8 **BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

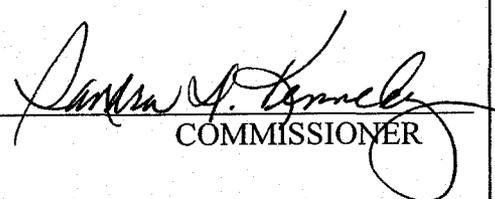
9 
 10 CHAIRMAN


 COMMISSIONER

11
 12 
 13 COMMISSIONER



COMMISSIONER


 COMMISSIONER

14
 15 IN WITNESS WHEREOF, I, ERNEST G. JOHNSON,
 16 Executive Director of the Arizona Corporation Commission,
 17 have hereunto, set my hand and caused the official seal of
 18 this Commission to be affixed at the Capitol, in the City of
 19 Phoenix, this 6th day of JANUARY, ~~2010~~
 20 2011

21
 22 _____
 23 ERNEST G. JOHNSON
 24 EXECUTIVE DIRECTOR

25 DISSENT: _____

26 DISSENT: _____

27 SMO:JMK:red/WVC

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