

NEW APPLICATION



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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 ITS 2010  
RENEWABLE ENERGY STANDARD  
IMPLEMENTATION PLAN AND  
DISTRIBUTED ENERGY  
ADMINISTRATIVE PLAN AND REQUEST  
FOR RESET OF RENEWABLE ENERGY  
ADJUSTOR

DOCKET NO. E-01345A-09-\_\_\_\_\_

APPLICATION

E-01345A-09-0338

Arizona Public Service Company ("APS" or "Company") makes this filing in compliance with the Arizona Corporation Commission's ("Commission") Renewable Energy Standard ("RES") Rules.<sup>1</sup> APS submits the following for Commission approval: its 2010 Implementation Plan ("2010 Plan");<sup>2</sup> its Distributed Energy Administration Plan ("DEAP"); and its Renewable Energy Adjustor Rate Schedule, which was updated to reflect the costs of the 2010 Plan. The 2010 Plan and the DEAP incorporate the provisions approved by the Commission in previous RES filings. The 2010 Plan provides for the acquisition of renewable generation beyond the compliance requirements,<sup>3</sup> and increased funding for the Distributed Public Assistance Program and for research, development, commercialization and integration of renewable projects. Additionally, APS is developing cost-effective, user-friendly tools that will allow customers to determine the opportunity and benefits of customer-sited solar systems. The most significant changes in this

<sup>1</sup> A.A.C. R14-2-1801, *et seq.*

<sup>2</sup> As required by A.A.C. R14-2-1813.

<sup>3</sup> Both the Solana Concentrated Solar Power Plant ("CSP") and the Starwood CSP are expected to be operational within the five year period of the 2010 Plan. These facilities will be among the largest CSP plants in the world.

1 Implementation Plan address the dramatically-increased customer demand for distributed  
2 non-residential renewable resources by expanding those programs and providing  
3 innovative approaches to reduce the cost of these incentives. As a result, APS is seeking  
4 Commission authorization to exceed the non-residential distributed energy ("DE")  
5 requirement. To implement the 2010 Plan, APS is seeking approval of a 2010 RES Budget  
6 of \$85.5 million, which would result in an increase above the 2009 RES surcharge of  
7 approximately twenty-four cents per month for residential customers.<sup>4</sup>

## 8 **BACKGROUND**

9 The RES Rules require that APS file an annual plan describing how the Company  
10 intends to comply with the RES Rules for the next calendar year, as well as providing a  
11 five-year forecast for the program. In compliance with that provision, APS hereby  
12 provides its 2010 Plan that describes:

13 1. The Eligible Renewable Energy Resources that APS is proposing to add each  
14 of the next five years and a description of the kilowatts and kilowatt hours expected to be  
15 obtained from each of those resources;

16 2. The estimated cost of those Eligible Renewable Energy Resources, including  
17 cost per kilowatt hour and total cost per year;

18 3. A description of how each Eligible Renewable Energy Resource will be  
19 obtained;

20 4. A proposal that evaluates whether APS's existing rates allow for the ongoing  
21 recovery of the reasonable and prudent costs of complying with the RES Rules; and

22 5. A line item budget that allocates specific funding.

23 The 2010 Plan demonstrates APS's strong commitment to renewable energy, and is  
24 attached as Attachment A.<sup>5</sup> The DEAP, which addresses the consumer participation  
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26 <sup>4</sup> The 2010 RES Implementation Plan budget reflects a \$7.1 million budget increase over the \$78.4 million  
budget approved as part of APS's 2009 Implementation Plan.

27 <sup>5</sup> Because the 2010 Plan contains some competitively confidential information, certain information has been  
28 redacted in the version filed in Docket Control. The competitively confidential information will be  
provided to Commission Staff and other appropriate parties to this proceeding upon execution of a  
protective agreement.

1 process, budget, incentive levels, eligible technologies, system requirements and  
2 installation requirements, is attached as Attachment B.

3 Under the RES Rules, in 2010 APS must acquire two and one-half percent of its  
4 total retail sales from renewable energy resources,<sup>6</sup> and twenty percent of the renewable  
5 energy requirement must be from DE applications.<sup>7</sup> One-half of the DE requirement must  
6 be met by residential applications, and the other half must be met by non-residential  
7 applications.<sup>8</sup> The 2010 Plan, which covers the five-year period from 2010 through 2014,  
8 addresses the implementation strategy APS will employ to achieve compliance with the  
9 2010 RES requirements and expand its non-residential DE programs beyond RES  
10 requirements.

### 11 **DISTRIBUTED ENERGY PROGRAMS**

12 The most fundamental change between APS's 2009 and 2010 RES Implementation  
13 Plans is the expansion of the Company's programs and funding that result in the production  
14 of distributed renewable energy beyond compliance. In 2008, the DE Program contributed  
15 17,324 MWh<sup>9</sup> of distributed renewable energy to APS's portfolio; in 2009, it is anticipated  
16 that DE generation will exceed 75,000 MWh.<sup>10</sup> For 2010, APS is seeking \$73.0 million to  
17 support customer participation in its residential and non-residential DE programs.

#### 18 *Non-Residential Distributed Energy Programs*

19 Customer demand for non-residential renewable energy has significantly increased  
20 in the last several months. By the second quarter of 2009, non-residential customer  
21 requests for project funding exceeded the funding authorized by the Commission in the  
22  
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24 <sup>6</sup> A.A.C. R14-2-1804(B).

25 <sup>7</sup> A.A.C. R14-2-1805(B).

26 <sup>8</sup> See A.A.C. R14-2-1805(D). Up to ten percent of the DE requirement can be achieved from wholesale  
27 sales. See A.A.C. R14-2-1805(E). By 2014, the percentage of electric retail sales from renewable  
28 resources is 4.50%, and increases to 15% by 2025. See A.A.C. R14-2-1804(B).

<sup>9</sup> Distributed Energy resources produced 16,450 MWh of energy in 2008—following application of RES  
multipliers that number was reported as 17,324 MWh.

<sup>10</sup> Assuming approval of an additional \$143 million authorization in lifetime Performance Based Incentive  
contract commitments through 2009, as requested in a separate application (Docket No. E-01345A-09-  
0263), and the continued increase in participation in APS's residential DE incentive programs.

1 APS 2009 RES Implementation Plan.<sup>11</sup> APS anticipates this trend will continue, and that  
2 customers' interest in commercial and industrial renewable projects will provide the  
3 opportunity to exceed the 2010 RES non-residential DE requirements. As a result, to  
4 implement the 2010 Plan, APS is seeking lifetime contract authorization and an associated  
5 annual funding level sufficient to exceed the non-residential DE targets in each year of this  
6 Plan.

7 Currently, most non-residential projects are eligible for Production Based Incentives  
8 ("PBIs"), where customers are paid incentives based on the amount of renewable energy  
9 produced over the term of the contract, which is generally ten or twenty years. On a year-  
10 to-year basis, the cost of these incentives is moderate; over the term of the contract the  
11 incentives are significant and require substantive financial commitments from the  
12 Company. In the 2010 Plan, APS is seeking approval for \$18.2 million for non-residential  
13 DE incentives and lifetime PBI authorization of \$570 million.<sup>12</sup>

14 In this plan, APS is proposing new approaches that will increase the deployment of  
15 DE resources at a lower cost, including new DE transaction models and the execution of  
16 opportunities that are made available in response to the Company's DE Request for  
17 Proposal ("RFP"). In addition, APS is proposing changes to the administration of the PBI  
18 incentives that will provide non-residential customers with continued opportunity to  
19 receive incentives for the installation of DE systems and reduce program costs. To assure  
20 that the non-residential DE incentives are equitably distributed, the 2010 Plan includes a  
21 proposal to limit the PBI incentives paid for large projects to a maximum of two  
22 megawatts.

23 Preliminary results from APS's DE RFP demonstrate an ability to significantly  
24 reduce costs to APS and its customers compared to the current renewable energy incentive  
25 program. Incentives resulting from the DE RFP are approximately half of the cost of  
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27 <sup>11</sup> In a separate application (Docket No. E-01345A-09-0263), APS filed for approval of an additional \$143  
million authorization in lifetime Performance Based Incentive contract commitments through 2009.

28 <sup>12</sup> The \$570 million includes the \$220 million authorization the Company is seeking for the remainder of  
2009. See n.8 and n.9, supra.

1 incentives from the standard DE program. The proposed total expenditure for the lifetime  
2 of DE RFP projects is \$250 million, which should result in more than 135,000 megawatt  
3 hours per year of renewable energy generation once fully deployed. Where available, APS  
4 will use other customer and non-customer funds, such as additional incentives and/or grant  
5 opportunities, to leverage overall program results and reach additional customer segments.

6 Through the DE RFP, APS has identified two new DE transaction models for  
7 customer-sited projects that qualify for compliance with the RES DE targets. As part of  
8 this Application, APS is seeking an acknowledgement from the Commission that these  
9 non-standard approaches are acceptable and that the credits from renewable energy  
10 produced will apply towards the DE requirements.

11 The *Customer Aggregation Model* creates an arrangement between APS and a third-  
12 party developer for a specified amount of DE (in this case by 2013) at a predetermined  
13 price. The developer has the ability to phase-in projects over several years and the  
14 flexibility to determine the optimal mix of customer installations and technologies needed.  
15 The installations will be customer-sited and designed to offset the customer load. This  
16 approach will dramatically reduce Renewable Energy Credit ("REC") costs,<sup>13</sup> increase  
17 implementation efficiency, and permit contractual controls over system and installation  
18 performance.

19 The other new DE transaction model is the *REC and Energy Contract Model*, in  
20 which APS and the DE developer work together to meet the needs of the Company's  
21 largest customers. Under this model, renewable energy systems would be installed at the  
22 customer's facility, and APS would purchase all of the energy and associated RECs  
23 generated by the system. The customer would then contract with APS to purchase back all  
24 of the renewable energy.

25 To address the increased demand for PBI incentives and to facilitate growth of the  
26 non-residential distributed program beyond compliance, APS has developed a new

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27 <sup>13</sup> One REC is created for each kilowatt hour of energy derived from an eligible renewable energy resource.  
28 See A.A.C. R14-2-1803(A). A utility complies with the RES Rules by obtaining RECs, see R14-2-  
1804(A), and incentives are paid based on RECs.

1 approach for providing PBIs. APS is proposing to add \$100 million each year to its  
2 authorization for commitments to PBI contracts, which would recognize the total, or  
3 lifetime, value of the incentives paid under a PBI commitment. With this approach, \$20  
4 million of annual lifetime PBI contract authorization per year would be available for  
5 medium sized projects.<sup>14</sup> For large projects,<sup>15</sup> there would be a maximum of \$80 million  
6 lifetime PBI contract authorization per year, and these projects would compete for  
7 incentive funding. While similar in many respects to the current program, the nomination  
8 and selection of large projects would be limited to two times per year, and the available  
9 lifetime cap would be equally divided between both periods. To implement this approach,  
10 APS is seeking an increase for the non-residential lifetime PBI authorization by \$100  
11 million in each of the next five years.

### 12 **Residential Distributed Energy Programs**

13 In order to fully comply with the 2010 RES requirement, APS is seeking \$44.1  
14 million for up-front incentives for residential customers. While both photovoltaic and solar  
15 water heater installations increased significantly in 2009, residential installations lag  
16 behind that of non-residential customers. To stimulate the residential markets, in April  
17 2009, APS launched the APS Solar Homes Program in conjunction with the APS Energy  
18 Star Homes program. This program rewards homebuilders with heightened incentives for  
19 their commitment to develop communities with energy efficient homes that are augmented  
20 with renewable technologies. This should increase the overall number of new energy  
21 efficient homes with renewable technologies, built in the most cost-effective way for end-  
22 use customers. By 2013, based on current economic forecasts, APS anticipates that  
23 approximately 2,700 solar-equipped and solar-ready homes will result from this program.  
24 Expanding residential participation, along with identification and implementation of new  
25  
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27 <sup>14</sup> "Medium projects" are those projects where the generator or inverter is rated 100 kilowatts or less, or any  
project whose lifetime commitment is less than \$2.5 million and does not qualify for an up-front incentive.

28 <sup>15</sup> "Large projects" are those projects where the generator or inverter is greater than 100 kilowatts, or where  
the lifetime incentive commitment is greater than \$2.5 million.

1 strategies to increase and best leverage DE, will continue be an important focal area for  
2 APS during the next few years.

### 3 **OTHER KEY PROGRAMS**

4 In the 2010 Plan, APS is seeking approval to increase funding for the Distributed  
5 Public Assistance Program, which supports installation of DE systems for limited income,  
6 school, non-profit, and governmental customers. Because these customers may have  
7 limited financial means and/or relatively low or non-existent taxable income to be offset by  
8 tax credits, the standard renewable energy incentive programs are not likely to meet their  
9 needs. When available, APS will continue to use RES funds in conjunction with other  
10 related programs to leverage overall program results and reach additional customer  
11 segments.

12 Additionally, in the 2010 Plan, APS proposes to increase funding for the research,  
13 development, commercialization, and integration (“RDCI”) of renewable energy projects.  
14 The allocation is intended to enhance and accelerate the development and deployment of  
15 renewable resources for the benefit of APS customers. The increased funding is necessary  
16 as APS moves from the analytical phase of certain projects to field studies. The RDCI  
17 budget will fund, in part, the development of: 1) an analysis system to examine the roll-out  
18 of solar energy infrastructure and required electric grid technologies to enable such  
19 infrastructure; 2) compressed air storage and battery storage technologies; and 3) vehicle-  
20 to-grid technologies. Activities undertaken through this program are either supported  
21 solely by APS, or in partnership with other organizations and entities, including public  
22 research institutions, government laboratories, and private industry.

23 In addition, APS also continues the development of cost effective user-friendly tools  
24 for customers to determine the opportunity and benefits of customer-sited solar systems.  
25 To address customer questions related to the financial benefits of an investment in a solar  
26 system, including both potential systems costs and impacts on monthly bills, APS has  
27 contracted for the development of a Solar Calculator, an electronic tool for customers to  
28 utilize. The tool will provide customers with information about typical systems installed

1 on different home sizes, and the impact of solar on their individual APS bill. The  
2 development of the Solar Calculator is in its initial stages and is expected to be operational  
3 in 2010.

4 To assist in the strategic deployment of distributed solar systems, APS has engaged  
5 Navigant Consulting to identify the rooftop photovoltaic potential throughout the  
6 Company's service territory. The study inventories building types on a zip-code basis to  
7 provide the number of each type of building and identifies the typical size solar unit for  
8 each type of facility, based on a number of factors, including square footage, roof-type, and  
9 building height. This study is currently underway and should be completed by year end.  
10 APS has also begun exploring potential partnerships in both the public and private sectors  
11 to determine the potential for a cost-effect second phase that may further customize this  
12 information in a mapping format that would be integrated with the Solar Calculator.

### 13 **DEAP MODIFICATIONS**

14 While there is no requirement to submit the DEAP for approval on an annual basis,  
15 APS made some modifications to the DEAP approved by the Commission in Decision No.  
16 70654 (Dec. 12, 2008), and, therefore, is seeking approval of modifications to the DEAP,  
17 including:

- 18       ▪ Simplified methodology for calculating the up-front incentive for small wind  
19       generators;
- 20       ▪ Inclusion of equipment qualifications and installation guidelines in order to  
21       better assist interested parties in the proper design and installation of geothermal  
22       heating and cooling systems;
- 23       ▪ Categorization of non-residential DE projects as "Large Projects", "Medium  
24       Projects", and "Small Projects", and specification of a process for obtaining  
25       incentives for each type of project; and
- 26       ▪ Reduction of the time allowed for a customer to execute a Credit Purchase  
27       Agreement (from 60 days to 30 days before the reserved funds are released).

28

1 The DEAP modifications are designed to improve customer service and eliminate any  
2 issues that might limit customer participation or satisfaction.

### 3 **FUNDING REQUIREMENTS**

4 The funding for the 2010 Plan reflects full compliance with all provisions of the  
5 RES Rules and takes APS beyond compliance with non-residential DE targets and the  
6 overall RES requirement for 2010. The annual increases in the program budgets are driven  
7 mainly by the increased interest in APS's programs. To fully implement the 2010 Plan, a  
8 total of \$85.5 million will be needed; this is \$7.1 million above the 2009 funding level.  
9 Given \$6 million in base rates, the current RES Adjustor would need to be reset to collect  
10 \$79.5 million, which will result in an RES Adjustor rate of \$0.008532 per kilowatt hour,  
11 with monthly caps of \$3.41 for residential customers, \$126.75 for commercial and  
12 industrial customers with less than three megawatt loads, and \$380.26 for commercial and  
13 industrial customers with greater than three megawatt loads.<sup>16</sup> The APS Renewable  
14 Adjustor Rate Schedule is attached as Attachment C.

15 As in years past, APS anticipates that some portion of the RES funding that is  
16 collected in 2009 may not be expended, depending predominantly upon the penetration of  
17 the residential market. It is too early in the year to accurately predict that amount. The  
18 Company will provide an estimate of that information prior to Commission consideration  
19 of the 2010 Plan.

20 APS intends to provide written notice to its customers of the 2010 Plan filing, as it  
21 did with its 2009 RES Implementation Plan.

### 22 **CONCLUSION**

23 For the reasons discussed above, APS requests that the Commission determine that:

24 1. The APS 2010 RES Implementation Plan with a budget of \$85.5 million, as  
25 described herein, is approved;

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26 <sup>16</sup> In 2009, the cap for residential customers is \$3.17; and \$117.93 for commercial and industrial customers  
27 with less than three megawatt loads, and \$353.78 for those with loads three megawatts or more. The 2010  
28 Plan provides the data necessary to support the level of costs APS believes will be incurred, and the data  
necessary to demonstrate that the proposed rate schedule is designed to recover only costs in excess of  
market cost of comparable generation.



**ATTACHMENT A**

**APS RES Implementation Plan 2010 to 2014  
July 1, 2009**



**Arizona Public Service Company**

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**Arizona Public Service  
Renewable Energy Standard  
Implementation Plan  
2010 to 2014**

ATTACHMENT A

APS RES Implementation Plan 2010 to 2014  
July 1, 2009

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**ATTACHMENT A**

**APS RES Implementation Plan 2010 to 2014  
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## ATTACHMENT A

APS RES Implementation Plan 2010 to 2014  
July 1, 2009

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Exhibit 1A	2010 Implementation Plan Overview
Exhibit 1B	RES Program Summary
Exhibit 2A	RES Budget Summary
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Exhibit 3A	Existing and Planned Generation - Energy
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Exhibit 5B	Distributed Energy Projected Program Outcomes
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## ATTACHMENT A

### APS RES Implementation Plan 2010 to 2014 July 1, 2009

#### 1. EXECUTIVE SUMMARY

Arizona Public Service Company (“APS” or “Company”) has prepared this Implementation Plan (“Plan”) for the five-year period of 2010 to 2014 in compliance with the Renewable Energy Standard and Tariff Rules (“RES”)<sup>1</sup>, which requires the filing of an annual plan describing how utilities intend to comply with the rule requirements for the next five years. This Plan describes the renewable energy resources that may be added during the next five years, the estimated customer funding and surcharge amounts required to acquire those resources, and a budget that allocates specific funding. The current RES requirement is 2.50% of total retail sales in 2010, and the rules prescribe that 20% of that requirement is to come from distributed energy solutions. The Company’s Plan is also consistent with APS’s planning goals and resource acquisition plans described in the Company’s Resource Plan Report (“RPR”) filed with the Commission on January 29, 2009.<sup>2</sup>

As a separate document, the Company is filing its updated Distributed Energy Administration Plan (“DEAP”). The DEAP describes the participation process for a wide range of customers, presents incentive levels, and discusses eligible technologies and system requirements, all of which together will provide a program that APS believes will encourage customer participation. In this filing, APS has made only minor adjustments to the DEAP that was approved as part of the 2009 Implementation Plan.<sup>3</sup>

The Implementation Plan and the DEAP are similar to the plans filed for 2009.<sup>4</sup> A few key program elements reflected in this Plan are provided below:

- APS’s successful Distributed Public Assistance Program (“DPAP”) will be expanded to meet the needs of limited income, school, non-profit, and governmental customers.
- APS anticipates project selection for its Small Generation Pilot Program, with some projects expected to come on line as early as the fourth quarter of 2010. The Small Generation Pilot Program aims to simplify the Request for Proposal (“RFP”) and contracting processes for small renewable generators and provide APS with valuable small renewable generation through the Plan period.
- APS also anticipates selection and implementation of projects resulting from the Distributed Energy (“DE”) RFP. The DE RFP was designed to increase the number of distributed installations, and will do so at a substantial cost savings over normal DE incentives. With the addition of projects selected from the DE RFP, APS will exceed the non-residential RES DE targets for each year described in this Plan.

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<sup>1</sup> A.A.C. R14-2-1801, *et. seq.*

<sup>2</sup> Docket No. E-01345A-09-0037.

<sup>3</sup> Decision No. 70654 (December 12, 2008).

<sup>4</sup> Docket No. E-01345A-08-0331, filed July 1, 2008 and supplemented October 10, 2008.

## ATTACHMENT A

### APS RES Implementation Plan 2010 to 2014

July 1, 2009

- APS will move forward with the execution of its Solar Homes program for homebuilders to promote the development of communities that incorporate energy efficient and solar technologies in home design and construction.
- APS will continue to procure a mix of solar, wind, geothermal, and biomass/biogass renewable resources seeking to exceed compliance with the RES requirements through the Plan period.
- Upon Commission approval, APS will implement the Company's proposed Community Power Project – Flagstaff Pilot. The program application is currently pending at the Commission.<sup>5</sup> The Pilot would provide Flagstaff-area customers with DE systems including photovoltaic (“PV”) arrays, solar water heaters, and small scale wind turbines.
- In order to expand the non-residential DE program beyond near-term RES compliance, APS proposes annual increases in the lifetime contract authorization for Performance Based Incentive (“PBI”) commitments to support customer installations under the program on an annual basis and for projects proposed as part of the Company's DE RFP.<sup>6</sup> In addition, APS proposes additional modifications to its non-residential distributed program to increase program efficiency. The proposed changes include updates to project eligibility and program administration.
- APS will enhance its research, development, commercialization and integration program, including the acceleration of the development and deployment of renewable resources for the benefit of APS customers.

APS currently estimates the cost of its RES related projects and programs to be \$85.5 million in 2010 and increasing to an annual cost of \$208.1 million by 2014, with a five year total of \$729.6 million. The peak annual cost in this five-year planning window is 2014 at \$208.1 million, due primarily to the expanded DE program and two new large renewable generation projects<sup>7</sup> generating approximately 570 MW during their first full year in 2014.

RES funding is intended to cover the cost of utility scale renewable generation in excess of the cost of conventional resource alternatives, incentive payments for DE resources, marketing expenses, and program implementation and administration costs. The costs for renewable generation collected through the RES adjustor during 2010 are partly based on APS's existing contracts and APS's small generation RFP. These contracts, if brought to fruition, will enable APS to meet and exceed renewable generation and total RES energy targets in 2010. Additional projects will be required for APS compliance with RES targets in the four subsequent years of

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<sup>5</sup> Docket No. E-01345A-09-0227 (May 11, 2009).

<sup>6</sup> In a separate application (Docket No. E-01345A-09-0263), APS filed for approval of a \$220 million authorization in lifetime Performed Based Incentive contract commitments through 2009. The proposed budget in this Plan includes the \$220 million.

<sup>7</sup> Solana and Starwood are concentrating solar power (“CSP”) projects. The Solana project was approved in Decision No. 70531. The Starwood application is currently pending approval in Docket No. E-01345A-09-0261.

## ATTACHMENT A

### APS RES Implementation Plan 2010 to 2014 July 1, 2009

this planning period. The costs for DE incentives and the program budget are based on incentives developed as part of the Commission Staff's Uniform Credit Purchase Program ("UCPP") working group, preliminary results from APS's DE RFP and APS's best estimations of market penetration for the various technologies available to consumers.

At this time, APS is requesting adjustor funding of \$79.5 million for 2010 (the adjustor is currently designed to collect approximately \$72.4 million annually). The requested adjustor amount, along with the \$6 million collected in base rates, would total the \$85.5 million of funding needed to meet the requirement.

## ATTACHMENT A

APS RES Implementation Plan 2010 to 2014  
July 1, 2009

### 2. INTRODUCTION

#### A. Renewable Energy Requirements

APS has prepared this Implementation Plan for the five year period 2010-2014 in compliance with the RES Rules. The RES requires that affected utilities satisfy an annual renewable energy requirement by providing a percentage of their electric retail sales from renewable resources. The required percentage for the current implementation period begins at 2.50% in 2010 and increases to 4.50% in 2014.<sup>8</sup> That minimum percentage increases to 15% of the utility's retail sales by the year 2025.<sup>9</sup>

This rule defines renewable resources as: 1) "renewable generation" projects that are constructed solely to export their energy production to the utility; and 2) DE that is a renewable resource application installed at the customer premises and used to displace customer energy consumption.<sup>10</sup> As part of the RES, the energy generated or displaced by DE is applied towards the percentage of the utility's distributed renewable energy requirement.<sup>11</sup> For both Renewable Generation and DE, the unit used to track kilowatt-hours ("kWh") derived from renewable resources for purposes of compliance with the RES is the Renewable Energy Credit ("REC"), where one kWh equals one REC.<sup>12</sup>

The RES requires regulated utilities to file an Implementation Plan each year for review and approval by the Arizona Corporation Commission ("ACC" or "Commission").<sup>13</sup> The Plan must describe the procurement of renewable energy resources for the next five calendar years that will meet the requirements of the RES.<sup>14</sup> This description must identify the considered technologies, the expected schedule for the resource incorporation on a year-by-year basis, and a description of the kilowatts ("kW") and kWh that are expected to be added to the APS portfolio by the incorporation of those resources.<sup>15</sup> The RES provides that reasonable and prudent costs incurred to comply with the RES Rules are recoverable.<sup>16</sup> Further, the RES provides that implementation of the approved Plan by the utility shall serve to measure the utility's compliance with the RES.<sup>17</sup> With Commission approval of APS's Plan, APS anticipates exceeding compliance with the RES

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<sup>8</sup> A.A.C. R14-2-1804(B).

<sup>9</sup> *Id.*

<sup>10</sup> A.A.C. R14-2-1802(B).

<sup>11</sup> A.A.C. R14-2-1805(B).

<sup>12</sup> "Renewable Energy Credit" means the unit created to track kWh derived from an Eligible Renewable Resource of kWh equivalent of Conventional Energy Resource displaced by Distributed Renewable Resources. A.A.C. R14-2-1801(N).

<sup>13</sup> A.A.C. R14-2-1813(A).

<sup>14</sup> A.A.C. R14-2-1813(B).

<sup>15</sup> *Id.*

<sup>16</sup> *See*, A.A.C. R14-2-1808.

<sup>17</sup> A.A.C. R14-2-1815(C).

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renewable energy requirement in each year of the Plan period. Attached as Exhibit 1B is a summary of the APS targets, energy requirements, and program budget.

#### **B. Renewable Generation Challenges and Risks**

In developing this Plan, APS evaluated renewable resources available for procurement in the next one to two years (“the near-term”), as well as those anticipated to become available over the remainder of the five-year period covered by this Plan and beyond (“the longer-term”). Although there exists uncertainty in the specific details of many of those renewable resources, APS believes it has chosen a strategy that will meet or exceed the renewable generation and total RES energy targets, assuming all existing and planned facilities come to fruition.

APS’s implementation strategy for achieving compliance with RES targets for the years 2010-2014 are detailed in this Plan. The Plan and the resulting renewable energy goals do not come without some risk related to meeting the renewable resource targets. Inasmuch as those risks are currently definable and quantifiable, they are identified and discussed in this Plan. Those risks include issues such as: the availability, level and consistency of federal, state and local incentives; availability of renewable energy projects executed by financially and technically sound developers; adequate transmission resources to deliver new resources to APS load; renewable energy projects matching APS’s anticipated cost profiles; and the timing of new resource availability.

The timely delivery of energy from renewable resources is critical to APS’s compliance with the RES energy targets, and development of these types of projects typically requires between two to five years. Experience across the nation indicates renewable generation projects suffer from high levels of project failure, broadly summarized as the inability to meet contract energy delivery dates. These failures and delays can be attributed to a broad range of issues, but are generally due to the relatively emergent nature of renewable resource markets and the current national and global economic climate. APS’s experience, both with renewable energy projects and with conventional energy technologies, suggests that careful project screening can reduce, but not eliminate, some of the risk associated with project failures.

#### **C. Distributed Energy Targets**

The RES requires that affected utilities satisfy a percentage of the annual renewable energy requirement through the addition of DE resources. The required percentage for the current implementation period is 20% of the total requirement in 2010 and increases to 30% by 2012.<sup>18</sup> That percentage remains at 30% of the total renewable energy requirement through 2025.

In the time since approval of APS’s first RES Implementation Plan in 2008, the Company has gained considerable experience with and understanding of the opportunities and challenges associated with deployment of DE at the scale required under the RES. Through this Plan, APS is initiating the opportunity to exceed the non-residential DE target described in the RES.

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<sup>18</sup> A.A.C. R14-2-1805(B).

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Further, APS believes it has identified a means by which to provide non-residential customers continued opportunity to receive incentives for the installation of DE systems while also benefitting from program cost reduction over the period described in this Plan. As part of APS's ongoing efforts to increase the penetration of DE to meet the RES DE targets at a lower cost than APS's current Implementation Plan, the Company issued its DE RFP in August 2008.

APS recognizes that DE is an important component of the RES requirement. Therefore, as part of this Plan, APS proposes a funding level believed necessary for compliance with the residential DE target and sufficient to exceed the non-residential target in each year of this Plan. APS continues to work toward meeting the residential DE target and has developed programs and strategies for increasing residential system installation. APS has also continued to aggressively market the residential DE programs. However, to date, residential customer participation in the program is not sufficient to meet the residential DE target. Even with availability of significant incentives, customers must still provide significant personal funding to install DE systems on their homes. Today, the typical 3 kW residential distributed PV system costs more than \$23,000 to install, attracts about \$15,000 in government and utility incentives, and requires a customer investment of about \$8,000. While residential DE programs have grown dramatically in the months since Commission approval of APS's first Implementation Plan, further increasing customer participation will prove challenging in the current economic climate.

Assumptions used to build the DE program budget are based on incentives developed as part of Commission Staff's UCPP working group, previous year program installations and reservations under APS's Renewable Energy Incentive program ("REIP"), project sales and development time frames, variations in the levels of technology maturity, and availability of equipment for installation. The proposed DE incentive budget and the incentive budget allocation are designed to achieve the residential distributed energy target and provides for exceeding the non-residential distributed energy target for the full five years described in the Plan. If the DE program assumptions prove to be correct, the 2010 cost for this component of the Plan is estimated to be approximately \$73.0 million. This amount escalates to approximately \$117.0 million in 2012. It is expected that 2012 will be the peak cost year in this five-year planning window because that is the last year the DE requirement ramps up relative to the total RES requirement. After 2012, the increases to the requirement are based on the growth of the overall RES requirement and retail sales increases.

#### **D. Required Program Funding**

The Plan proposed by the Company is estimated to cost a total of \$729.6 million over the five-year Plan period. The budget summary can be found in Exhibit 2A. This Plan is anticipated to result in APS exceeding compliance with the overall RES requirements in each year. The cost for 2010 is estimated to be approximately \$85.5 million and increases to \$208.1 million in 2014. The increase in costs is mainly driven by increasing energy targets, large solar generating projects becoming operational, and DE program expansion. In this Plan, APS is requesting an adjustor to recover only the estimated 2010 costs of approximately \$79.5 million, resulting in a \$7.1 million increase over the \$72.4 million currently collected on an annualized basis. The

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requested adjustor amount, along with the \$6 million collected in base rates, would total the \$85.5 million of funding needed to meet the requirement. In each succeeding year, as part of its Implementation Plan, APS will continue to request a reset of the adjustor to collect the estimated costs for the following calendar year. Current estimates for each of those years can be seen in Exhibit 2A.

Certain exhibits contained in this Plan include pricing estimates made by APS in development of the program costs. Some of the pricing included in this Plan is from existing competitively confidential contracts. The price estimates are necessary to allow APS to provide the information sought by the Commission as part of the Implementation Plan. APS believes it is in the best interest of customers and the Company to ensure that future suppliers of renewable resources compete for the right to supply renewable energy without a pre-conceived notion of the pricing assumptions or competitively confidential pricing in this plan. Therefore, APS has submitted a redacted version of that confidential information in Exhibit 3C and 3D and will provide Staff the competitively confidential information pursuant to an executed Protective Agreement.

This Plan makes reasonable assumptions concerning renewable energy resources, and as APS gains more experience with renewable resources, future Plans will account for the realities APS encounters in the actual implementation of the RES.

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#### 3. APS 2010 IMPLEMENTATION PLAN

##### A. Energy

The RES identifies the minimum annual percentage of a utility's retail sales that must be obtained from renewable resources. The 2010 target is 2.50% of retail sales. The renewable resource targets required to meet APS's targets for each year are detailed in Exhibit 1B. The targets detailed by the RES are described in two categories, renewable generation and DE resources.

Renewable generation is represented by projects that export their energy production to the utility. These projects are typically large-scale facilities that use renewable resources such as wind, solar, geothermal, biomass, and biogas to generate electricity. Energy produced from those resources is delivered through the transmission and distribution systems and, ultimately, to the utility's customers.

DE resources are represented by technology applications that are physically installed on the customer's property. Those applications are typically specifically designed for the distributed setting. Distributed applications under the RES include a wide range of technologies; today those technologies are most frequently represented by PV and solar water heating systems. DE resources can be tied to the existing APS distribution system or can be installed as a remote application, independent of the APS distribution system.

##### B. Capacity

The RES targets are energy based (kWh), with no capacity (kW) requirements. However, the Plan utilizes generation capacity assumptions to forecast compliance with the energy targets. When equating energy targets to planned capacity levels, it is important to recognize that the capacity factors<sup>19</sup> for various renewable generation technologies vary significantly. Some technologies, such as geothermal and biomass, are very predictable and can produce at capacity factors near 80-90%, similar to conventional base load generation. Some renewable generation technologies, such as solar, are predictable, but have inherently low capacity factors of 15-30%, driven by the daily availability of solar radiation. Other renewable generation technologies, such as wind, are less predictable on a real-time basis. However, wind will generally produce capacity factors in the range of 25-40% annually, depending on the characteristics of the wind resource in a given location.

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<sup>19</sup> Capacity factor is a value used to express the average production level of a generating unit over a given period of time. Capacity factor is expressed as a percentage of the maximum possible production if the generating unit had operated at its maximum capacity rating for all hours during the period. For example, a generating facility which operates at an average of 60% of its maximum capacity over a measured period has a capacity factor of 60% for that period.

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The balance of the technologies employed is critical and the ultimate balance of the technology portfolio will dictate the additional capacity required to achieve the energy targets. Exhibit 3B provides the level of capacity for the specific mixture of technologies assumed in this Plan for the coming five years. Targeted additions described in Exhibit 3B are not intended to be an exact representation of the resources APS intends to acquire, but merely an example of a potential resource mix based on APS's current resource strategy. The economics of a particular resource or technology will ultimately determine the extent to which any one technology is employed as part of the overall portfolio.

#### C. Renewable Generation

The Plan was designed with sufficient flexibility to provide the best opportunity to meet or exceed RES targets in a cost effective manner. The Plan provides descriptions of the current projects under contract, as well as the expected resource additions over the next five years. The renewable resources contemplated under this Plan are consistent with APS's short and long-term planning goals and resource acquisition plans described in the Company's RPR.<sup>20</sup>

##### *i. Existing Renewable Generation*

As shown in Exhibit 3B, APS is anticipating renewable generation capacity of 244 MW by the end of 2010. Of that capacity, 218 MW are from Purchased Power Agreements ("PPA") for projects currently operating or anticipated to be completed in 2010, 6 MW are from APS-owned solar facilities, and 20 MW are estimated from the APS proposed Small Generation Program discussed later in this Plan.

##### *ii. Renewable Generation Procurement Plan and Process*

The energy required to meet the APS targets and the allocation established to support anticipated demand for the Green Power rates<sup>21</sup> in each of the next five years is outlined in Exhibit 1B. In general, two to five years is required from the initiation of an RFP to the point at which energy can flow into the APS system from a new renewable generation project. The majority of that time is required for development and construction.

APS has anticipated the need for additional energy output from renewable resources in 2010 and beyond. Accordingly, APS implemented two separate competitive procurement processes in 2008, seeking additional renewable energy including distributed resources with commercial operation dates ranging from 2010 to 2014. In 2009, APS issued its renewable small generation RFP with a commercial operation date of 2010. The competitive procurement processes will continue to consist of, but not be limited to, the issuance of RFPs, negotiated bilateral supply

<sup>20</sup> Docket No. E-01345A-09-0037 (January 29, 2009).

<sup>21</sup> Current Green Power rate schedules GPS-1 and GPS-2 were approved by the Commission in Decision No. 69663. They were created to allow customers to purchase a portion of their energy usage from renewable resources. These purchases do not count toward RES targets. Revisions to GPS-1 and GPS-2 and the new Green Power rate schedule GPS-3 are currently awaiting Commission approval in Docket No. E-01345A-08-0614.

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contracts, and other strategies for obtaining long-term renewable resources. Implementing an effective competitive procurement process will ensure a fair and unbiased procedure that will efficiently incorporate a full range of renewable resource alternatives from the marketplace. APS expects to continue engaging the market and seeking cost effective projects over the next few years.

In the evaluation of bids submitted during the competitive procurement process, analysis of proposals will include an evaluation of: energy production; capacity value; deliverability; technical characteristics; operational performance; reliability; efficiency; credit; and respondent experience. The procurement and project selection procedure employed by APS has been documented and certified by an independent auditor as required by the RES.<sup>22</sup>

This Plan attempts to fully acknowledge the reality that PPAs and project development methods will not necessarily conform to required delivery schedules and planned quantities. Renewable generation projects, like other generation projects, may be delayed or fail to achieve scheduled commercial operation.<sup>23</sup> APS also expects output from existing renewable projects to fluctuate from year to year. The tool used to manage these planning and output variances will be the banking of RECs. APS's initial renewable generation bank was established using RES-eligible energy procured prior to the effective dates of the RES rules, or August 14, 2007. After that date, changes to the REC bank are only expected to come from withdrawals to meet compliance or deposits from excess generation in any given year. APS uses a first-in, first-out approach to track the REC bank balance. In other words, withdrawals will be made from the oldest vintages first and will move to the next year after the oldest year has been exhausted.

#### *iii. Identifying Renewable Generation Requirements*

During the five years covered by this Plan, the renewable resource targets increase from 2.50% in 2010 to 4.50% in 2014. In the near-term, this Plan focuses on existing and planned renewable resource projects to meet those targets. This Plan also contemplates that new renewable generation will be contracted and developed during the five-year period covered by this Plan. APS has based its program budget and energy procurement on several assumptions, which are discussed below. Details are competitively confidential and have been redacted. Those details will be provided to Staff pursuant to an executed Confidentiality Agreement.

##### 1. Costs of Renewable Generation

For purposes of resource and budget planning, the costs of renewable generation are based on the portion of the renewable energy cost that is above the market cost of comparable conventional generation.<sup>24</sup> For existing contracts, the percentage above APS's cost for comparable generation

<sup>22</sup> A.A.C. R14-2-1812(B)(6) requires "A description of the procedures for choosing Eligible Renewable Energy Resources and a certification from an independent auditor that those procedures are fair and unbiased and have been appropriately applied." Certification letters were filed as part of the RES Annual Compliance Report filed in Docket No. E-01345A-95-0491, on February 29, 2008, and in Docket No. E-01345A-07-0468 on April 1, 2009.

<sup>23</sup> For example, the commercial operation date for the Solana CSP project is now expected to be April 2013.

<sup>24</sup> A.A.C. R14-2-1801(K) defines Market Cost of Comparable Conventional Generation.

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was established at the time the contract was signed and the percentage is applied to the total contract cost for the planning year. For targeted future contracts, the price is estimated based on existing renewable generation contracts, recent market experience, and general trends observed in renewable generation project development. These percentages for future contracts will be re-evaluated during subsequent five-year planning periods. All renewable resource costs are described in terms of dollars per MWh above APS's comparable conventional generation.

The detailed cost assumptions used to develop the budget for procurement of these resources are included in Exhibits 3C and 3D. Because this information is competitively confidential, it will be provided to Staff pursuant to an executed Protective Agreement. It should also be noted that the existing contracts referenced in Exhibits 3C and 3D are long-term commitments that are either already in place or nearly finalized at the date of this Plan.<sup>25</sup>

#### *iv. Small Generation Pilot Program*

Traditionally, a small renewable generation project developer's best opportunity to execute an agreement with APS was by bidding into an RFP. While this process works well for large projects, APS recognizes that this process may seem onerous for a small system developer. In the Company's 2009 RES Implementation Plan, APS received approval for a one-year Small Generation Pilot Program<sup>26</sup> for projects that produce less than 35,000 MWh per year. The program is available to all RES eligible technologies, but is limited to a total of 45,000 MWh per year. The 45,000 MWh maximum is further segregated into 10,000 MWh for solar and 35,000 MWh for all other RES eligible projects, although the exact mix of projects will depend on the response to the program.

APS began implementation of the Program in early 2009 and issued an RFP on March 25, 2009. In addition to the criteria mentioned above, APS also developed "Threshold Criteria" designed to provide local benefits similar to large scale renewable projects. To pass the initial screening, bidders were required to meet at least three of the following five criteria:

<b>Criteria</b>	<b>APS Goal Criteria</b>	<b>Respondent Compliance Document or Information</b>
1. Community Participation Partnerships	Community groups and residents to participate and benefit from a small renewable energy generation plant in their community.	Letter of interest from the community partner submitted with the RFP response.

<sup>25</sup> The Company's application for approval of the Starwood CSP PPA, filed on May 22, 2009, in Docket No. E-01345A-09-0261 is currently pending at the ACC.

<sup>26</sup> Decision No. 70654 (December 18, 2008).

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Criteria	APS Goal Criteria	Respondent Compliance Document or Information
2. School/Educational Partnerships	Encourage renewable energy educational opportunities for educators and students.	This could be accomplished with renewable energy curriculum, internships, physical location, or other respondent proposals. Letter of interest from the school or educational institution should be submitted with the RFP response.
3. Geographic Diversity - Defined as zip codes outside of the Metro Phoenix area.	Projects in diverse areas of APS service territory.	Include site zip code in the RFP response.
4. Job Creation	Support the creation of at least 2 renewable energy jobs.	Include number of construction and operating jobs in the RFP response.
5. Leverage Federal, State, or Local grants, contributions, or funding sources (other than Investment Tax Credit or Production Tax Credit).	Encourage participation of research or other public partners.	Letter of support or commitment from funding source.

A bidder's conference was held on April 16, 2009 to provide additional information and answer questions related to the RFP. More than one hundred people attended by phone or in person. A total of 30 bids were received on June 4, 2009, representing an array of renewable technologies including biogas, wind, and several solar technologies. APS plans to develop a short-list of finalists in the third quarter of 2009 and complete PPAs with the successful bidders in the fourth quarter of 2009. The RFP requires the projects to be commercially operable no later than year-end 2011.

Based on the current responses, APS believes the results of the RFP are promising, and will promote the development of small generation systems. While the selection process is not complete, initial results appear promising and APS anticipates issuing a second Small Generation RFP in 2011. APS will report additional results from the pilot in its 2009 RES Compliance Report. Initial assessment of the Small Generation Pilot suggests the approach will have a favorable impact on this market segment and should result in valuable project additions. APS believes a second Small Generation RFP may be appropriate as part of its 2011 Implementation Plan strategy.

#### **D. Distributed Energy**

APS recognizes the importance of DE resources as part of the Commission's comprehensive renewable energy objectives. Distributed resources have become an increasingly important part of APS's renewable energy strategy. APS has successfully implemented its REIP for nearly two years and overall APS has more than eight years of experience in implementing DE programs. As part of this Plan, APS seeks to implement new strategies to increase the penetration of DE

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within its service territory and to reduce the cost of achieving residential RES targets, and exceeding the non-residential RES targets.

As part of this Plan, APS proposes a funding level it believes necessary for compliance with the residential DE program. APS also proposes authorization for the lifetime of the contracts and the associated annual funding level that the Company believes will be sufficient to exceed the non-residential DE targets in each year of this Plan.

Interest in APS's residential DE program has increased over the past year, even with a challenging economic climate. Continued improvements in residential program implementation, successful marketing, outreach and education efforts, and further incorporation of the REIP into APS's broad-based technology infrastructure are working to manage more customer transactions more efficiently. As part of this plan, APS developed or expanded two key components of its residential programs: 1) the continued implementation of APS's residential DE incentive program; and 2) refinement and continuation of the Solar Homes Program, which is designed to drive energy efficient and solar home construction. APS views this as a valuable component of the long-term success of a broadly successful residential program.

APS's non-residential DE program includes four components: 1) annual increases in the amount of \$100 million per year to the lifetime Performance Based Incentive ("PBI") commitment authorization with associated annual funding to allow customers the opportunity to install DE systems above and beyond what would be required for APS compliance with the RES targets; 2) the implementation of DE projects identified through the Company's 2008 DE RFP; 3) the continued support of agreements entered into through year-end 2009;<sup>27</sup> and 4) the continued funding of projects eligible as wholesale DE.

APS also plans expansion of the DPAP designed to provide additional financial support for residential customers who would not otherwise be able to afford residential DE systems.

As part of a separate application before the Commission, APS proposed the Community Power Project - Flagstaff Pilot.<sup>28</sup> The Community Power Project represents an important step forward as both an opportunity for technical learning related to DE system interaction with APS's electric distribution system, and an outstanding opportunity to gain further insight into consumer interest in and interactions with DE technologies. The Community Power Project is included as part of this Plan.

Planning models, implementation strategies, and budgeting for the DE programs were all designed with specific consideration for the insight from the UCPP working group. In addition, APS relied on several years of experience with the REIP and ongoing dialogue with many industry stakeholders.

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<sup>27</sup> APS filed for approval of a \$220 million authorization in lifetime Performance Based Incentive contract commitments through 2009 in Docket No. E-01345A-09-0263 (May 26, 2009).

<sup>28</sup> Docket No. E-01345A-09-0227 (May 11, 2009).

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#### *i. Expansion of the Non-Residential DE Program Beyond Compliance*

The combination of the success of APS's non-residential DE program in 2009 and the success of the DE RFP have resulted in commitments for non-residential DE resources to comply with the RES target for each year of this Plan. APS recognizes our customers' interest in continuing to install increasing amounts of DE technologies. APS also recognizes the Commission's continued support for developing renewable energy strategies that exceed the targets established in the RES. Therefore, as part of this Plan, APS proposes an expansion of the non-residential DE program that will result in energy beyond that required for near-term compliance. In addition, the expansion is designed to continue development of customer-sited DE projects.

The expanded program includes two fundamental pieces: 1) annual increases to the lifetime PBI authorization to continue to facilitate medium and large customer installations; and 2) an annual budget for non-residential Up Front Incentives ("UFI") to continue to facilitate smaller or generally lower cost customer installations. The increased lifetime PBI commitment authorization is accompanied by a forecast of the annual funding requirement necessary to meet incentive payments resulting from the energy produced in each budget year. The annual funding required for Distributed Energy Incentives are included in Exhibit 4A. In addition, the detailed interaction between annual funding and the lifetime PBI commitment authorization is included in Exhibit 4C.

With specific experience from APS's REIP and based upon dialogue with customers and other stakeholders,<sup>29</sup> the expanded non-residential program will allocate the annual \$100 million increase in the lifetime PBI to two areas: \$80 million for large projects, and \$20 million for medium projects, as defined below.

Large Project: any electricity producing project whose inverter(s) or generator(s) is rated greater than 100 kWac or any project whose lifetime incentive commitment is greater than \$2.5 million. Incentives will be capped for electric producing systems at a capacity size of 2,000 kWac per interconnection point; actual system size is not limited under this program although all other interconnection and program requirements remain applicable.

Medium Project: any electricity producing project whose inverter(s) or generator(s) is rated 100 kWac<sup>30</sup> or less, or any project whose lifetime incentive commitment is less than \$2.5 million, and does not qualify for an up-front incentive.

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<sup>29</sup> On June 2, 2009, APS held a 2010 Renewable Energy Standard Implementation Plan stakeholder meeting focused on the status of the non-residential DE program. APS informed stakeholders that participation in the non-residential program had exceeded expectations, which presented challenges for the Company in the acceptance of PBI reservation under the existing Commission approved lifetime PBI commitment authorization of \$77 million. Options to reduce costs without diluting the amount of distributed renewable energy generated were discussed with stakeholders. APS is using stakeholder input to further refine its DE program.

<sup>30</sup> Solar nameplate capacity is commonly designated in dc (direct current), while utility operations and services are provided in ac (alternating current).

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Projects eligible as Medium will participate in the non-residential program as presently described under Section 6 of APS DEAP. Projects eligible as Large will also be required to conform to the provisions of the APS DEAP. A limited number of modifications have been made to accommodate to the goal of increasing competition among Large projects' incentive funding and thereby reducing incentive costs. Generally, nomination and selection of Large projects will be limited to two times per year and the available lifetime cap will be equally divided between both periods. A description of the DEAP and a summary of included enhancements are provided in Section 3.D(vi).

#### *ii. Distributed Energy RFP*

On August 14, 2008, APS issued an RFP for DE Resources ("DE RFP"). Through the DE RFP, APS sought to increase the quantity of DE resources to assist in compliance with the RES Rules and to lower costs of DE resources relative to that forecast through continued implementation of the current incentive programs. To facilitate this goal, APS considered offers that phase-in over several years and introduce alternative and potentially cost-saving methods for providing customers choices related to DE. Bids submitted under the DE RFP were due on October 17, 2008.<sup>31</sup>

APS received submittals from 12 separate entities, representing 22 distinct proposals. The proposals submitted were principally focused on PV installations for non-residential customers. After performing the initial screening process to determine bid conformance, APS was presented with 12 projects for consideration that aggregated to more than 400 MWdc<sup>32</sup> and 400,000 MWh/yr of DE projects. From these projects, the Company reviewed the details of each proposal and the economics relative to the REIP. All proposals that represented a reduced cost compared to funding the same projects through the REIP were short-listed for further discussions. These short-listed projects were subjected to a more thorough economic evaluation. APS selected only a portion of the proposed projects, first in an effort to gain additional and specific experience with these types of DE transactions and second in an effort to preserve opportunities for customer projects under other DE programs. In addition, APS began a direct dialogue with the customers identified by the bidders to determine the extent of their interest in installed DE systems as described in bids submitted to the DE RFP.<sup>33</sup> APS has entered into contract negotiations with several counterparties that will provide over 130,000 MWh/yr of DE projects (when fully deployed) at a significantly reduced cost when compared to the REIP. This total quantity represents a little more than one-quarter of APS's 2014 DE requirement. Two new DE transaction types were proposed among the bids under negotiation. APS believes that each DE transaction type results in customer-sited projects that are qualified to meet the RES DE targets. Those transaction types are described below.

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<sup>31</sup> APS engaged Merrimack Energy Group, Inc., to act as Independent Auditor for this RFP.

<sup>32</sup> Solar nameplate capacity is commonly designated in dc (direct current), while utility operations and services are provided in ac (alternating current).

<sup>33</sup> The vast majority of conforming bids were submitted by project developers who identified either specific customer sites or potential market segments.

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#### 1. Customer Aggregation Model

This model would produce a negotiated arrangement between APS and a third-party developer for a specified amount of DE. The developer will have the ability to phase in projects over several years and will have the ability to determine the optimal mix of customer installations and technologies needed to meet their fixed REC price to APS in accordance with the contract. This contract type leverages a third party's expertise in partnership development and site selection to derive DE outcomes at a predetermined price. Benefits to the APS program include: dramatically reduced REC costs; contractual controls over system and installation performance; and increased implementation efficiency.

#### 2. REC and Energy Contract Model

In the REC and Energy Contract Model, APS and the DE developer enter into an agreement to meet the specific needs of large customers. Under this model, the developer would site the PV system at a customer's facility. APS would purchase all of the energy and the associated RECs generated by the system, then APS and the customer would enter into a separate agreement for the customer to purchase all of the energy from the DE system. Those contractual rate agreements will require separate approval from the ACC. This model provides a more economic way to integrate solar power for very large energy users. APS believes that this model, while different from the standard approach where APS purchases only the RECs, qualifies in contributing to the DE target under the RES.

In aggregate, when compared to the current cost of the non-residential DE program, the results of the DE RFP are projected to reduce program costs for RECs by approximately 50 percent.

#### *iii. Solar Homes Program*

In review of the DE program activity to date, nearly all participants are customers who have incorporated renewable technologies on existing facilities. From an end-user perspective, the most cost effective and convenient way of incorporating energy efficiency and renewable energy technology is at the time of initial design and construction.

As a result of today's economy, the local building market is extremely depressed when compared to the explosive growth seen in the recent past. Potential homebuyers are becoming more informed, selective, and demanding in order to stretch their limited purchasing power. Homebuilders are looking for ways to differentiate their product, not only from their competition, but from the quality home that they had previously sold.

In response to this opportunity, APS launched the APS Energy Star and Solar Homes Program in April of 2009. The goal of the program is to increase the overall number of energy efficient homes being built that include renewable technologies in the most cost-effective way for end-use customers. The program will reward homebuilders for their commitment to developing communities with renewable technologies. In exchange for this commitment (homebuilders must offer renewable technologies as a standard feature across the community), the builder will

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receive a supplemental incentive, and non-monetary benefits such as co-operative marketing, training, and technology assistance.

As part of this Plan, APS has included continued expansion of this effort with interested homebuilders. By 2013 based on current economic forecasts, APS anticipates that over 2,700 solar-equipped and solar-ready homes will be built as a result of this program.

#### *iv. Distributed Public Assistance Program*

As part of its 2009 Implementation Plan, APS began working to deploy DPAP funds in support of DE installations for limited income customers. APS proposes an increase in the budget by \$200,000 resulting in an overall proposed budget of \$500,000 to continue the development of the DPAP to meet the unique needs of our limited income, school, non-profit, and governmental customers. Because these customers may have limited financial means and relatively low or non-existent taxable income to be offset by tax credits, the standard REIP is not likely to meet the needs of these customers. Where available, APS will use other customer and non-customer funds to leverage overall program results and reach additional customer segments.

There are a number of concepts APS intends to expand upon, to help increase the utilization of DE with feedback from stakeholders, community leaders, and organizations including:

- Larger incentives. Because many of these customers have little or no tax liability, a standard incentive leaves them paying a larger portion of the total cost to install renewable systems than someone who could take advantage of tax credits. Larger than standard incentives and increased incentive authorizations may be an appropriate way to level the playing field.
- Contributions. In limited instances, APS may provide for the complete installation of systems including PV, solar water heating, and daylighting.
- Administrative and technical requirements. To address the unique and lengthy approval processes most schools and governmental agencies use, APS may be able to extend the reservation timelines to meet the needs of those groups. APS will also determine if there are contracting terms and conditions that could be modified to assist all limited income, school, non-profit, and governmental customers.

#### *v. Anticipated Distributed Energy Program Outcomes*

In developing the anticipated program outcomes, a number of assumptions about technologies and customer preferences were required. The assumptions included the anticipated number of projects by technology and the anticipated energy contribution from each DE project. Anticipated energy contribution was described by assumptions about average project size and average project production. The detailed assumptions were required for purposes of budget and planning; they are not intended to reflect allocations, funding authorization, or preference for any one technology. The assumptions are detailed in Exhibit 5A.

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Incentives were drawn from the draft UCPP working group efforts and are included in the APS DEAP. The DEAP, generally described below, details different incentive types for use in the DE program. For planning purposes, assumptions about customer preference for the variety of incentive alternative were required.

APS's proposed DE budget and anticipated resulting energy are described in Exhibits 4A and 4B. The lifetime authorization for commitments under the non-residential program is described in Exhibit 4C. The actual results of program implementation are likely to differ from those anticipated by APS's planning efforts as customers learn more about the variety of technologies and applications available as a result of APS's program marketing, advertising, and partnership development efforts.

Planning assumptions for the residential DE program are described in Exhibit 5A. Projections for the resulting installations under the residential DE program are described in Exhibit 5C.

#### *vi. Key Tenets of the Proposed Distributed Energy Administration Plan*

APS's DE program is detailed in the DEAP. While the DEAP is substantially the same as the version approved in Decision No. 70654, there have been some minor enhancements designed to improve clarity and customer service. In addition, the DEAP has been updated to reflect APS's approach for the implementation of a non-residential program that exceeds RES compliance targets. Those enhancements are discussed in a following section. Below are several key tenets of APS's program as described in the proposed DEAP:

##### 1. Administration

Project funding is not guaranteed until the customer receives a reservation confirmation from APS for each project. To receive a reservation and an incentive, applicants must follow the established reservation, installation, and inspection procedures.

##### 2. Equipment and Installation Requirements

Systems will be required to adhere to generally accepted industry standards, federal, state and local codes, all applicable regulatory requirements, and manufacturer recommendations for installation and operation. Systems must be installed by an Arizona-licensed contractor with an active certification for the technology being installed, and must conform to APS interconnection requirements, if applicable.

##### 3. Incentives

In the development of APS's distributed incentives, APS used the approach developed by the UCPP working group. Incentives are designed to defray some of the costs of a system designed to offset a typical load of a customer. Systems qualifying for DE incentives cannot qualify for other utility incentives.

*Residential* – Customers for residential incentives can apply for a one-time payment based on the DE system's capacity or based on the first year estimated

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savings provided by the DE system, dependent on the technology application. This type of incentive is referred to as an Up-Front Incentive ("UFI").

*Non-Residential* – Non-residential customers will either receive a UFI or a PBI, an incentive based on system production, which is paid over time. Projects receiving PBI are paid based on system energy output rather than on system capacity. Projects with a total incentive value of \$75,000 or less (calculated as the present value of the total of incentive payments) will receive a one-time capacity based incentive; all others will receive incentives based on production.

For installations receiving a UFI, the incentive amount is predetermined by the capacity or energy savings of the system. Customers who request a PBI for a DE system have the latitude to propose an incentive appropriate for their project; the PBI incentive matrix describes the maximum available incentive level. The non-residential program expansion described in this Plan is designed to better leverage that flexibility in hopes of driving down project incentive levels.

#### 4. Market-Driven Projects

Projects that fall outside of the standard administrative, equipment, or incentive requirements for DEAP projects or projects that are solicited by APS to achieve specific program goals may be eligible for incentives as market-driven projects. These projects must be comparable to conforming projects in financial efficiency to be considered for incentives.

#### 5. Customer Self-Direct

As set forth in APS's approved Adjustment Schedule SDR,<sup>34</sup> eligible customers are required to declare the amount of the self-directed funding requested by March 31<sup>st</sup> each year. These projects must be comparable to conforming projects in financial efficiency to be considered for incentives. The amount of funds allocated to customer self-directed projects will be disclosed in this Plan for the next program year. As noted in Exhibit 2A to this Plan, APS has not received any requests for self-direction to date.

#### 6. DEAP Enhancements

After beginning the process of implementing the DE incentive program that was approved by the Commission in Decision No. 70654 (December 18, 2008), APS discovered a number of minor issues that require a modification to the DEAP. These modifications are designed to improve customer service and eliminate any issues that might limit customer participation or satisfaction. In addition, modifications have been made to accommodate APS's proposed non-residential program expansion.

- APS simplified the methodology for calculating the UFI for small wind generators. The change eliminates the compounding effect of applying inverter efficiency more

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<sup>34</sup> Adjustment Schedule SDR, Self-Directed Renewable Resources, was approved by the Commission in Decision No. 70313.

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than once in the calculation. By making this change, the calculation more accurately reflects the true output of the system.

- APS has seen increased customer interest in geothermal applications. APS included equipment qualifications and installation guidelines to better assist interested parties in the proper design and installation of geothermal heating and cooling systems. By using equipment standards consistent with the federal tax credit requirements, along with an incentive based on annual energy savings, the program more accurately reflects industry standards in the design, and installation of systems, as well as ensuring that customers receive system appropriate incentives.
- In expanding the Non-Residential DE Program, APS described projects in three different categories: Large Projects, Medium Projects, and Small Projects. Large Projects will be eligible for PBI, with semi-annual nomination periods. Medium Projects will be eligible for PBI, with six, bi-monthly nomination periods. Small Projects will be eligible for UFI.
- Increased requests for non-residential incentives have placed demands on incentive funds in excess of total availability. The need to qualify and contractually bind applicants in a timely manner has become critical, such that, timely execution of a Credit Purchase Agreement (“CPA”) has become important to the effective administration of incentive funds and the PBI authorization. To improve equitability of incentive fund implementation, APS has reduced the time allowed for a customer to execute a CPA from 60 days to 30 days before the reserved funds are released.

#### *vii. Community Power Project – Flagstaff Pilot*

The Community Power Project - Flagstaff Pilot (“Community Power Project”)<sup>35</sup> will provide renewable energy from APS-owned DE systems to customers in a limited geographical area located in Flagstaff, Arizona. This pilot program will help APS gain valuable experience regarding the impact of DE systems on the distribution grid, and has the potential to increase DE deployment in APS’s service territory. As such, the Community Power Project will help facilitate the Company’s compliance with the distributed renewable energy requirements of the RES Rules. As part of the Community Power Project, APS proposes placing distributed renewable energy resources, including PV arrays, solar water heaters, and small-scale wind turbines, on approximately 250 homes and businesses in a limited distribution area. The Community Power Project will provide customers with a convenient solar opportunity: the benefits of a DE system, without the economic obligations of capital investments, or the cost and inconvenience of operating and maintaining the system.

As part of the Community Power Project, APS will also study significant information regarding distributed renewable energy systems. By utilizing smart grid technologies also being installed by APS in the area, the Company will study the impact of renewable energy systems on the distribution feeder, the energy and capacity impact of distributed PV deployments, the impacts of system availability, and the impact of environmental factors (such as weather) on the aggregated PV systems and the connected energy delivery system. Additionally, APS believes the

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<sup>35</sup> Filed for Commission approval in Docket No. E-01345A-09-0227 (May 11, 2009).

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Community Power Project will provide a better understanding of the reliability of renewable energy systems, as well as the life cycle costs for both residential and commercial applications. The information obtained from the Community Power Project should enable APS to deploy distributed renewable energy more effectively in the future.

If the Community Power Project is approved, deployment, carrying, and ongoing costs for the project through 2012 will be paid using funds that rolled over from the 2008 RES budget, as illustrated in Exhibit 2B.

#### *viii. Distributed Energy Incentive Budgets*

The proposed DE incentive budget for the five-year planning window is described in Exhibit 4A. The incentive budget is designed to result in sufficient residential DE installations to achieve the RES target.<sup>36</sup> The incentive budget for the non-residential program is sufficient to exceed the RES target. Annual changes in program budget are designed to accommodate an increase in the DE energy target, both as an increasing fraction of the total RES requirement and as the requirement itself increases. The incentive matrices incorporated as part of the DEAP describe incentive reductions every two years of the program. Those planned reductions were designed by the UCPP working group in an attempt to reflect the anticipation that DE technologies will decline in cost as market penetration and product availability increase. In 2010, the allocation for residential DE incentives is \$44.1 million.

The incentive budget for the non-residential DE program is expected to result in sufficient DE installations to exceed the RES targets in each year of this Plan. The budget can generally be divided into three areas 1) funds necessary to meet PBI obligation entered into through year-end 2009,<sup>37</sup> 2) funds necessary to meet contract obligations for contracts entered into as part of the DE RFP, and 3) funds for expanding the non-residential program beyond that required strictly for near-term compliance. In sum, these commitments to customers' incentives are \$18.2 million in 2010.

#### 1. Performance-Based Incentives - Lifetime Contract Commitment Authorization

In Commission Decision No. 70654, the Commission approved APS's 2009 RES Implementation Plan.<sup>38</sup> In that Decision, the Commission approved recovery of the cost of incentive payments to meet APS's contractual obligation for PBI paid to customers for non-residential distributed renewable energy projects up to \$77 million over the lifetime of the contracts. During 2009, APS experienced an unexpectedly large number of reservations for distributed projects under the program. As a result of the surge in customer requests for PBI reservations, the \$77 million authorization for PBI lifetime commitments was insufficient for APS to support the number and type of distributed energy projects that customers have requested under APS 2009 RES Implementation Plan. APS filed an application with the Commission,

<sup>36</sup> A.A.C. R14-2-1805(D).

<sup>37</sup> APS filed for approval of authorizations for lifetime PBI contract commitments through 2009 in Docket No. E-01345A-09-09-0263 (May 26, 2009).

<sup>38</sup> Docket No. E-01345A-08-0331 (December 18, 2008).

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which is currently pending, to increase the authorization on lifetime PBI payments from \$77 million to \$220 million to accommodate outstanding reservation request and expected customer interest through 2009.<sup>39</sup> APS requested expedited approval, to ensure that customer projects could move forward through 2009.

As part of this Plan, APS has developed its expansion of the non-residential DE program around an annually increasing lifetime PBI authorization. Specifically, in each year of the Plan, APS proposes increasing the lifetime PBI authorization by \$100 million. APS anticipates that the increased funding under the lifetime PBI commitment will result in a growing number of increasingly cost-effective customer DE installations.

APS views projects resulting from the DE RFP as substantially the same as commitments under the PBI program. As a result, the Company has included those commitments in its calculation of lifetime PBI authorization. In 2010, the lifetime PBI authorization necessary to implement those projects and program described by this Plan is \$570 million, with \$250 million required for the DE RFP. Details of the requested PBI commitment authorization for all of the years described in this Plan are included in Exhibit 4C.

#### 2. Customer Self-directed Funding

The DEAP describes potential funding for customer self-directed projects. As part of the DEAP, a budgetary earmark is required to fund projects meeting the criteria of customer self-directed projects. As of the March 31, 2009 deadline, APS had not received any requests for self-direction; therefore, no allocation was established.

#### 3. Budgeting Assumptions and Flexibility

As previously described in this Plan, the annual funding level for DE incentives was established based on the estimates of the energy needed for compliance, anticipated consumer demand, project sales and development time frames, variations in the levels of technology maturity, and availability of equipment for installation. In the event that funds collected for use in the DE incentive program are not fully subscribed in a program year, those funds will be applied to the next program year. To continue to adapt to customer demand and market changes, APS will continue to implement the incentive budget flexibility granted in Decision No. 70313. In that Decision, APS was granted the ability to reallocate up to 20 percent of the incentive budget to match customer demand.

#### ix. *Marketing, Advertising and Partnership Development*

APS's marketing effort for 2010 will build on the marketing activities of 2009 to continue advancing the primary goals including:

1. Creating an increased awareness of the APS Renewable Energy programs available to customers;

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<sup>39</sup> Docket No. E-01345A-09-0263 (May 26, 2009).

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2. Promoting and developing educational curriculum and consumer education pieces about DE through specific written materials, events, and APS's website;
3. Increasing the understanding and participation among vendors and other stakeholders;
4. Deliver messages that will motivate APS customers to adopt renewable energy technologies;
5. Positioning the APS REIP as a beneficial choice customers can make to address the growing energy needs and environmental concerns that face Arizona.

The key objectives of the marketing plan are 1) to motivate APS customers to become more aware of, and build a comfort level with, distributed renewable energy technology; 2) to help customers recognize the ability DE has to meet their individual energy goals as well as those of Arizona; and 3) to help move them to action through taking advantage of available renewable energy incentives. To accomplish these objectives, the marketing plan will incorporate a combination of compelling messages, critical program partners, community outreach, and an effective and convincing use of media, both placed and earned.

The marketing plan will include a variety of important strategies and tactics to accomplish the program goals including the following:

- Identify, evaluate and refine messages to address adoption barriers for residential customers, builders, and commercial customers.
- Continue a media relations plan that includes mass media to raise visibility of renewable DE alternatives and motivate APS customers to move along the path of adopting those technologies.
- Continue to use and refine direct marketing to motivate APS customers.
- Continue to cultivate contractor alliances via co-op advertising programs.
- Continue to educate customers about DE through events, seminars, workshops, and the APS website.
- Continue to create strategic alliances to increase exposure of APS DE messages to various targeted audiences.
- Optimize the APS website as an information resource for customers, installers and other stakeholders. Leverage ongoing opportunities to enhance the website based on customer and stakeholder feedback.
- Leverage online advertising and communications. Look for opportunities to incorporate social media tactics into the marketing mix.
- Create sales tools and marketing materials to support both residential and non-residential customer acquisition (e.g. as installers and home builders).

Modifications to our communication strategies will be made to address changing market conditions and key learnings throughout the marketing process.

Each year of experience informs our market preparation for the coming year. APS will continue to review available data for customer program marketing budgets among other states and utilities, and consider the level of anticipated effort to create consumer demand based on the

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breadth of available technologies and the proposed DE incentive budget. The proposed annual budget for 2010 to 2014 is detailed in Exhibit 2A.

#### **E. Implementation and Administration**

In developing both a strategy and a budget for implementation of the RES, a logical separation was created between those elements required to support renewable generation and those elements required to support DE. Renewable generation involves expertise in utility scale renewable generation technologies, competitive procurement and evaluation processes, project siting, utility integration, and transmission and distribution related issues. The DE program is a mass market program that involves thousands of individual interactions requiring customer communication, interconnections, inspections, customer billing, and a sophisticated system to monitor REC production. Of course, certain resources are used to support both portions of the RES and they are characterized as such in the descriptions that follow.

##### *i. Resources Required for the Renewable Generation Program*

The renewable generation program requires subject-matter experts to identify those aspects of renewable generation procurement, engineering, and market analysis that are unique from those same areas in conventional energy operation, and to coordinate with the impacted operational areas of APS to seamlessly integrate renewable resource management into APS's standard business practices. The knowledge-area experts comprising the renewable generation administrative team include the personnel necessary to manage the program. Program management includes establishing policies and procedures, procuring renewable generation, handling contract administration and construction management, managing benchmarking and resource integration studies, and performing program monitoring and compliance reporting.

There are many APS personnel who support the program but are not part of the administrative team. Those employees are not included in the program costs; they are considered "non-incremental" because they are necessary to support the general operations of the Company and have responsibilities that are not directly related to the renewable generation program. This includes, but is not limited to, regulation and pricing, accounting, legal, contract administration, contract settlement, transmission planning, power and gas marketing, and resource planning.

##### *ii. Resources Required for the Distributed Energy Program*

The implementation strategy for the DE program was developed with the following targets:

- Developing an accurate, efficient, and customer friendly process.
- Integrating the program processes into the general business operations.
- Creating a scalable process that responds to adjustments in the volume of program participation.
- Supporting the strategic marketing efforts of the program.

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Accomplishing these objectives requires a considerable investment in program implementation. The DE program requires a substantial number of individual transactions and each transaction impacts numerous parts of APS's business infrastructure. As such, implementation costs for the DE programs are significant. Incorporation of projects from the DE RFP may provide opportunities to reduce the number of individual transactions APS is required to manage and the DE RFP can work to leverage APS's strengths in management of complex contract negotiations and contract management.

#### 1. Program Resources

The implementation team is comprised of the personnel necessary to execute the DE incentive program. This includes the fixed payroll personnel who are required to administer the reservation and interconnection applications and agreements, review system design for conformance with DEAP and interconnection requirements, process incentive payments, answer customer and installer questions about the program, and perform field inspections. Also included are the variable payroll personnel required to tag utility equipment to identify potential backfeed sources, and provide billing support to partial-requirements customers, as well as the personnel required to manage the execution of the program, develop and execute the marketing and advertising programs, and provide ongoing program monitoring and compliance reporting. The number of implementation team members required is directly related to the number of program participants.

There are also resources supporting the program that are neither part of the administrative nor the implementation teams. These personnel are considered "non-incremental" and are required to support the general operations of the utility and have responsibilities that are not directly related to the distributed program. This includes, but is not limited to, regulation and pricing, accounting, legal, contract administration, and meter reading.

#### 2. Material Costs

Measuring the actual number of kWh returned to the grid by DE resources requires the use of a bi-directional meter rather than a standard utility meter. The incremental cost charged to the RES is the difference in cost between the bi-directional meter and the standard utility meter.

For compliance verification and program evaluation purposes, the DEAP proposes to capture monthly meter reads for DE systems generating electricity. APS believes that customers will also be interested in the ability to track total kWh generated by their system. To facilitate both the meter read capture requirement and to help customers track the kWh production by the DE system, APS may install and read the system meter for participants in the program. The only costs charged to the RES are those costs associated with providing the second meter to record system production.

There are also incidental material costs associated with the program, including, but not limited to, system locks, tags, inspection tools, and transportation for inspection personnel.

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APS may also install an interval recording meter on a sampling of sites. That data will be used to conduct studies on the coincidence of solar output vs. APS system load. The only material cost charged to the Program will be the incremental costs of the interval recording meter.

#### 3. Technological Improvements Required

APS continues to review the existing process flows in order to ensure the effective and efficient use of resources required to cost-effectively implement the DE incentive program. These processes require integration with existing systems, including customer billing, APS's website, program and operations databases, accounting systems, and dispatch and scheduling tools. APS's 2009 RES Implementation Plan advanced several such projects that will facilitate additional efforts to further integrate RES programs and expand opportunities to offer streamlined interfaces for customers and stakeholders.

APS also continues the development of cost effective user-friendly tools for customers to determine the opportunity and benefits presented by solar systems. Based on the Company's experience to-date, a customer who is considering investing in a renewable energy system for a home or business wants to know the financial benefits of such an investment, including both potential systems costs and impacts on monthly bills.

To address that threshold question, APS has contracted for the development of a Solar Calculator, an electronic tool for customers to utilize. The tool will help customers learn about typical systems installed on different home sizes. The Solar Calculator will compare the customer's individual usage, based on their actual APS bills, and provide analyses regarding benefits for the individual customer. APS believes that availability of this type of information will be a fundamental component in a customer's decision-making regarding solar resources. The development of the Solar Calculator is in its initial stages and is expected to operational in 2010.

In addition, APS continues work in the following areas:

- Database Integration: APS implemented IS projects that combine a number of individual databases into one centralized system. The consolidation helps ensure data accuracy, security, and consistency, as well as increasing overall processing and reporting efficiencies. This consolidation is designed to facilitate program customer support throughout APS's operation, including options for reservation status reporting (see below) and DE system reporting integration with customer billing.
- Interactive Web-based Project Tracking Application: Database integration will facilitate web-based project tracking milestones for both contractors and customers and automated correspondence/payment processing feature. Both of these elements will improve processing time, ensure consistency and completeness of information, and reduce reservation coordinator processing time.
- Renewable Website: APS is launching its newly redesigned Renewable website. The updated website is designed to cater to four different customer sectors: residential, businesses, contractors, and builders. The site will include an increased

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use of video, customer testimonials, and sector-specific information with the aim of providing information necessary to drive customer participation in renewable energy programs.

APS will continue to make incremental improvements to its program. This should limit the impact to customers, while still enabling APS to continue its progress in the implementation of technology improvements.

#### **F. Renewable Research, Development, Commercialization, & Integration**

APS proposes a budget allocation for research, development, commercialization, and integration (“RDCI”) of renewable resources in its Plan. The purpose of this budget allocation is to enhance and accelerate the development, deployment, commercialization, and utilization of renewable resources for the benefit of APS customers. For 2010, APS proposes to specifically allocate a minimum of \$750,000 of the total RDCI budget of \$2.0 million for research and development aimed at advancing the role of renewable energy in APS’s resource mix.

APS will prioritize projects and project funding to maximize the benefit to meet RES goals for renewable resources. Activities undertaken as part of this program are supported either by APS solely, or in partnership with other organizations and entities including private industry, public research institutions, and government laboratories. Demonstration and research related to energy storage and storage applications, such as vehicle energy storage, will rely on funds collected as part of the RES in 2008, which were rolled into 2009, as shown in Exhibit 2B.

##### *i. Research and Development*

APS’s commitments for Research and Development include:

- AzSMART (Arizona State University)  
AzSMART is an analysis system tailored to examine the successful roll-out of a solar-energy infrastructure in Arizona and to develop the required electric grid technologies to enable such a solar infrastructure.
- Compressed Air Energy Storage and Battery Storage  
Research and development, potentially including field deployment, of an electric distribution system storage demonstration project. The objective of the study will be to identify commercially viable battery storage systems and above ground compressed air energy storage technologies that could be integrated with renewable resources to shift the production curve of distributed resources and provide value to the energy delivery system.

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- Grid to Vehicle / Vehicle to Grid Study

APS plans to continue to support a study commenced in 2009 to address the potential for “vehicle to grid” and “grid to vehicle” technologies. In part, this work will provide an assessment for the development of a demonstration project for available technologies.

- ii. *Commercialization & Integration*

APS has completed several compelling commercialization and integration studies. Some of those studies have identified opportunities for additional investigation while others have provided direct benefit for the effective integration of renewable resources. In determining whether to fund new RDCI projects, APS will consider three key functional areas:

- Renewable technologies and available resources

This includes studies of the attributes, characteristics, and costs of renewable energy technologies and the availability and viability of renewable energy resources in the state of Arizona and the western United States. Specifically, APS believes it is valuable to explore renewable storage technologies, the forecasting of solar resources, methods for reducing water use for solar thermal generating stations and exploring geothermal resource opportunities. Research and development into new renewable technologies and improvements on existing technologies would also be included in this functional area.

- Roof-top Solar Potential Survey

To assist in the strategic deployment of distributed solar systems, APS has engaged Navigant Consulting to identify the rooftop photovoltaic potential throughout the Company’s service territory. The study inventories building types on a zip-code basis to provide the number of each type of building and identifies the typical size solar unit for each type of facility, based on a number of factors, including square footage, roof-type, and building height. This study is currently underway and should be completed by year end. APS has begun exploring potential partnerships with in both the public and private sectors, to determine the potential for a cost-effect second phase that may further customize this information in a format that allows for mapping and integration with the Solar Calculator (see 3.E.ii.3 Technology Improvements Required).

- Transmission and System Integration

These studies would be designed to provide APS with a better understanding of the operational impacts, costs of integration, and identify opportunities with renewable energy resources in the APS generation, transmission, and distribution systems. APS recognizes the critical importance of transmission in the success of the expansion of renewable generation. Any significant increase in renewable generation must be integrated into the long-term planning for transmission to be successful.

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- High Penetrations of Distributed Resources and Impacts on the Distribution Systems  
These studies would seek to develop a better understanding of the operational impacts, integration and interconnection issues, and strategic opportunities for distributed resources. Specific areas could include investigation of attributes of distributed resources including distributed energy performance, reliability, monitoring, energy and storage dispatch, weather forecasting, and smart grid interface with distributed energy. APS advances these areas with recognition of the importance of maintaining a reliable energy delivery system that includes increasing deployment of distributed resources.

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#### 4. COSTS OF PROGRAM IMPLEMENTATION

The cost of the APS Plan is comprised of three key cost segments: renewable generation, distributed energy, and RDCI. A summary of the costs of those segments and the major components for each segment is included in Exhibit 2A. APS currently estimates the cost to comply with the RES to range between \$85.5 million in 2010 to \$208.1 million in 2014, the peak year, with a five-year total of \$729.6 million. The annual increases are driven mainly by the annually increasing energy targets. As noted in Exhibit 2A, APS would anticipate that some funds collected in 2009 may not be spent or committed and will be available in 2010. At the time of this filing, APS cannot accurately predict that amount. The Company will provide an estimate of that information by November 1, 2009, or before the date of the Open Meeting to adopt this Plan, whichever is earlier.

RES funding is intended to cover the cost of utility-scale renewable generation in excess of the cost of conventional resource alternatives, incentive payments for distributed energy resources, marketing expenses, and program implementation and administration costs. The costs for renewable generation are based on APS's most current insights into that market. The costs for DE incentives and the program budget are based on incentives developed as part of the Commission Staff's working group and APS's best estimations of market uptake for the various technologies available to consumers.

At this time, APS is requesting adjustor funding of \$79.5 million for 2010 (the current RES adjustor would generate approximately \$72.4 million on an annualized basis). The requested adjustor amount, along with the \$6 million already included in base rates, would total the \$85.5 million of funding needed to meet the requirement. APS intends to request additional funding in each successive year for the following calendar year's estimated cost. In other words, in 2010 APS will request funding for the 2011 calendar year and so on. The estimates for years 2010 to 2014, contained in Exhibit 2A, would be updated each year to determine the necessary level of funding from customers.

**APS Renewable Energy Standard  
Implementation Plan for 2010-2014  
July 1, 2009**

**Exhibit 1**

**RES Program Summary**

**APS Renewable Energy Standard  
Implementation Plan for 2010-2014  
July 1, 2009**

**Exhibit 1 – RES Program Summary**

Exhibit 1A summarizes the RES Implementation Plan's objectives and outcomes.

Exhibit 1B outlines the annual APS renewable energy targets by renewable generation and distributed energy, anticipated needs, and summarizes the proposed budget.

## Exhibit 1A: APS 2010 RES Implementation Plan Overview

Implementation Plan Objectives	<ul style="list-style-type: none"> <li>▪ Compliance with all portions of RES Rules</li> <li>▪ Funding sufficient to comply with distributed energy residential target</li> </ul>
2010 Total RES Budget	<ul style="list-style-type: none"> <li>▪ Renewable Generation: \$10.9 million</li> <li>▪ DE Contracts &amp; Incentives: \$62.7 million</li> <li>▪ Total RES target: 734,402 MWh</li> <li>▪ Total expected RES production: 892,504 MWh <sup>(1)</sup></li> <li>▪ Distributed Public Assistance Program: \$0.5 million</li> <li>▪ Research, Development, Commercialization, &amp; Integration: \$2.0 million</li> <li>▪ Total: \$85.5 million</li> </ul>
2010 Renewable Generation	<ul style="list-style-type: none"> <li>▪ Energy purchases: \$8.5 million</li> <li>▪ Total expected generation: 779,066 MWh</li> <li>▪ Over 930 MW of renewable generation capacity by 2014</li> </ul>
2010 DE Contract and Incentive Budget	<ul style="list-style-type: none"> <li>▪ Residential Incentives: \$44.1 million</li> <li>▪ Non-residential lifetime PBI authorization: \$570.0 million</li> <li>▪ DE target: 146,880 MWh</li> <li>▪ Expected DE production: 213,438 MWh</li> <li>▪ Non-residential UFI: \$2.0 million</li> <li>▪ Non-residential PBI: \$16.2 million <sup>(2,3)</sup></li> <li>▪ Wholesale distributed energy: \$0.4 million</li> <li>▪ Total: \$62.7 million</li> </ul>
2010 Projected DE Outcome (Assumes sufficient customer demand)	<ul style="list-style-type: none"> <li>▪ Exceed total DE requirement</li> <li>▪ 10% wholesale (applied to non-residential)</li> <li>▪ 73,440 total residential MWh (5,400 installations)</li> <li>▪ 139,998 total non-residential MWh (90 installations)</li> </ul>
2010 RES Adjustor Rate Schedule & Monthly Caps	<ul style="list-style-type: none"> <li>▪ \$0.008532 per kWh (2009: \$0.007937 per kWh)</li> <li>▪ Residential cap \$3.41 (2009: \$3.17)</li> <li>▪ Non-residential (under 3 MW) cap \$126.75 (2009: \$117.93)</li> <li>▪ Non-residential (over 3 MW) cap \$380.26 (2009: \$353.78)</li> </ul>

(1) Net of Green Choice requirement. Represents energy available to meet RES requirement.

(2) Includes 2010 commitments associated with PBIs up to the requested \$220 million authorization.

(3) Includes DE RFP and \$100 million lifetime authorization expansion.

### Exhibit 1B: APS RES Program Summary

APS RES Targets (MWh)						
	2010	2011	2012	2013	2014	
APS Estimated Retail Sales	29,376,066	29,500,337	29,825,980	30,459,767	31,394,353	
APS RES Target - % of Retail Sales	2.50%	3.00%	3.50%	4.00%	4.50%	
<b>APS Total RES Target</b>	<b>734,402</b>	<b>885,010</b>	<b>1,043,909</b>	<b>1,218,391</b>	<b>1,412,746</b>	
Renewable Generation % of RES Target	80%	75%	70%	70%	70%	
<b>RES Generation Target</b>	<b>587,521</b>	<b>663,758</b>	<b>730,737</b>	<b>852,873</b>	<b>988,922</b>	
Distributed Energy % of RES Target	20%	25%	30%	30%	30%	
<b>Distributed Energy Target</b>	<b>146,880</b>	<b>221,253</b>	<b>313,173</b>	<b>365,517</b>	<b>423,824</b>	
Residential Distributed Energy Target (50%)	73,440	110,626	156,586	182,759	211,912	
Non-Residential Distributed Energy Target (40%)	58,752	88,501	125,269	146,207	169,530	
Wholesale Distributed Energy Target (10%)	14,688	22,125	31,317	36,552	42,382	
<b>Renewable Generation (MWh)</b>						
	2010	2011	2012	2013	2014	
Existing/Planned Generation Owned/Contracted	779,066	894,152	1,063,297	2,181,032	2,847,010	
RES Generation Target	587,521	663,758	730,737	852,873	988,922	
Projected Green Power Sales <sup>(1)</sup>	100,000	100,000	100,000	100,000	100,000	
<b>Energy Applied To/(Withdrawn From) APS Bank for RES</b>	<b>91,545</b>	<b>130,394</b>	<b>232,560</b>	<b>1,228,159</b>	<b>1,758,088</b>	
<b>Distributed Energy (MWh)</b>						
	2010	2011	2012	2013	2014	
Estimated Existing/Planned Distributed Energy <sup>(2,3)</sup>	198,750	340,177	445,894	536,056	598,842	
Wholesale	14,688	22,125	31,317	36,552	42,382	
Total Distributed Energy	213,438	362,302	477,211	572,608	641,224	
RES Distributed Energy Target	146,880	221,253	313,173	365,517	423,824	
<b>Energy Applied To/(Withdrawn From) APS Bank for RES</b>	<b>66,558</b>	<b>141,049</b>	<b>164,038</b>	<b>207,091</b>	<b>217,400</b>	
<b>APS RES Budget Summary (\$ MM)</b>						
	2010	2011	2012	2013	2014	
Total Renewable Generation	\$ 10.5	\$ 18.3	\$ 30.8	\$ 76.7	\$ 105.1	
Total Distributed Energy	\$ 73.0	\$ 95.9	\$ 117.0	\$ 91.3	\$ 101.0	
Research, Development, Commercialization, & Integration	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	
<b>Total RES Program Budget</b>	<b>\$ 85.5</b>	<b>\$ 116.2</b>	<b>\$ 149.8</b>	<b>\$ 170.0</b>	<b>\$ 208.1</b>	

**Notes:**

- (1) The Green Power (Rate Schedules GPS-1, GPS-2, Solar-3) is included only for procurement purposes. APS intends to procure enough energy to achieve RES compliance and to provide for Green Power purchased by customers. Green Power sold to customers will not be counted towards RES compliance and the cost of those resources is not included in the Renewable Generation budget.
- (2) For 2010 the Estimated Existing Distributed Energy is the projected DE at the end of 2009 based on the best available information at the time of the filing.
- (3) Assumes a lifetime PBI authorization expansion to \$970 million. Approximately 33,150 MWh is confirmed or in service under the \$77 million lifetime PBI authorization received as part of APS' 2009 Implementation Plan.

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**Exhibit 2**

**RES Budget Detail**

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Exhibit 2 – RES Budget Detail

Exhibit 2A details the RES program's proposed budget for 2010 through 2014 by line item for both Renewable Generation and for Distributed Energy.

Exhibit 2B details the allocation of funds collected in 2008 but which were not committed.

**Exhibit 2A: APS RES Budget Summary (\$ MM)**

	2010	2011	2012	2013	2014	2010-2014 Total
<b>Renewable Generation:</b>						
Energy Purchase	\$ 8.5	\$ 16.3	\$ 28.7	\$ 75.6	\$ 103.9	\$ 233.0
Administration	\$ 1.3	\$ 1.3	\$ 1.4	\$ 1.4	\$ 1.5	\$ 6.9
Implementation	\$ 1.1	\$ 1.1	\$ 1.2	\$ 1.2	\$ 1.2	\$ 5.7
<b>Renewable Generation - Subtotal</b>	<b>\$ 10.9</b>	<b>\$ 18.7</b>	<b>\$ 31.2</b>	<b>\$ 78.2</b>	<b>\$ 106.6</b>	<b>\$ 245.6</b>
Estimated Green Power Revenue	\$ (0.4)	\$ (0.4)	\$ (0.4)	\$ (1.5)	\$ (1.5)	\$ (4.2)
<b>Renewable Generation - RES</b>	<b>\$ 10.5</b>	<b>\$ 18.3</b>	<b>\$ 30.8</b>	<b>\$ 76.7</b>	<b>\$ 105.1</b>	<b>\$ 241.4</b>
<b>Distributed Energy:</b>						
<b>Contracts:</b>						
DE RFP	\$ 1.3	\$ 8.3	\$ 11.3	\$ 13.3	\$ 13.4	\$ 47.6
Production-based Contracts <sup>(1)</sup>	\$ 14.9	\$ 24.0	\$ 29.7	\$ 35.4	\$ 41.1	\$ 145.1
Wholesale <sup>(2)</sup>	\$ 0.4	\$ 0.6	\$ 0.8	\$ 0.9	\$ 1.1	\$ 3.8
<b>Total Contracts</b>	<b>\$ 16.6</b>	<b>\$ 32.9</b>	<b>\$ 41.8</b>	<b>\$ 49.6</b>	<b>\$ 55.6</b>	<b>\$ 196.5</b>
<b>Incentives:</b>						
Residential Up-front	\$ 44.1	\$ 51.8	\$ 64.1	\$ 31.1	\$ 34.6	\$ 225.7
Non-Residential Up-front	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 10.0
Customer Self-Directed <sup>(3)</sup>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total Incentives</b>	<b>\$ 46.1</b>	<b>\$ 53.8</b>	<b>\$ 66.1</b>	<b>\$ 33.1</b>	<b>\$ 36.6</b>	<b>\$ 235.7</b>
<b>Total Contracts and Incentives</b>	<b>\$ 62.7</b>	<b>\$ 86.7</b>	<b>\$ 107.9</b>	<b>\$ 82.7</b>	<b>\$ 92.2</b>	<b>\$ 432.2</b>
<b>Public Assistance Program</b>						
Administration	\$ 0.5	\$ 0.5	\$ 0.5	\$ 0.5	\$ 0.5	\$ 2.5
Implementation	\$ 1.6	\$ 1.7	\$ 1.7	\$ 1.8	\$ 1.8	\$ 8.6
Information Technology	\$ 3.1	\$ 3.1	\$ 3.4	\$ 2.9	\$ 3.1	\$ 15.6
Marketing & Outreach	\$ 1.5	\$ 0.5	\$ 0.1	\$ 0.1	\$ 0.1	\$ 2.3
<b>Distributed Energy - Subtotal</b>	<b>\$ 73.0</b>	<b>\$ 95.9</b>	<b>\$ 117.0</b>	<b>\$ 91.3</b>	<b>\$ 101.0</b>	<b>\$ 478.2</b>
<b>2009 Unallocated Funds <sup>(4)</sup></b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Research, Development, Commercialization, &amp; Integration</b>	<b>\$ 2.0</b>	<b>\$ 2.0</b>	<b>\$ 2.0</b>	<b>\$ 2.0</b>	<b>\$ 2.0</b>	<b>\$ 10.0</b>
<b>TOTAL</b>	<b>\$ 85.5</b>	<b>\$ 116.2</b>	<b>\$ 149.8</b>	<b>\$ 170.0</b>	<b>\$ 208.1</b>	<b>\$ 729.6</b>

**Notes:**

- (1) As can be seen in Exhibit 4D, this is only the portion of the new PBI incentives that would be expected to be paid in a given year. For any year new projects are assumed to have a mid-year in-service date and as a result actual commitments are double that shown in year one.
- (2) This line item is made up of a project (Snowflake White Mountain Power) that is split between Renewable Generation and Distributed Energy. The split is based on the amount of the wholesale DE component allowed in a given year.
- (3) As discussed in the Implementation Plan no customers have requested self-direction and therefore no allocation has been made.
- (4) Estimated funds collected in 2009 but unallocated. Collected but unallocated funds cannot be accurately calculated at the time of the July 1 filing. APS will update the amount prior to Commission consideration of the Implementation Plan.

**Exhibit 2B: 2008 APS RES Budget Rollover (\$ MM)**

	2009	2010	2011	2012	2013	2014
<b>2008 RES Net Funds Available</b> <sup>(1)</sup>	\$ 8.3	\$ 7.2	\$ 4.0	\$ 1.2	\$ 0.0	\$ 0.0
Community Power Project <sup>(2)</sup>	\$ 1.1	\$ 2.7	\$ 1.5	\$ 1.2	\$ -	\$ -
Energy Storage <sup>(3)</sup>	\$ -	\$ 0.5	\$ 1.3	\$ -	\$ -	\$ -
<b>2008 RES Net Funds Remaining</b>	\$ 7.2	\$ 4.0	\$ 1.2	\$ 0.0	\$ 0.0	\$ 0.0

**Notes:**

- (1) Represents RES funds collected in 2008 that were unallocated by 12/31/2008 and which were not applied towards APS's 2009 RES adjustor as part of the ACC's review and approval of the APS 2009 Implementation Plan.
- (2) Deployment, carrying, and ongoing costs. Assumes completion of an APS rate case and allocation to rate base beginning in 2013.
- (3) Estimated expenditures for energy storage.

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**Exhibit 3**

**Renewable Generation**

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**Exhibit 3 – Renewable Generation**

Exhibit 3A details the expected energy contribution from existing and planned renewable generation projects.

Exhibit 3B details the expected capacity contribution from existing and planned renewable generation projects.

Exhibit 3C details the estimated total cost above conventional generation for each existing and planned renewable generation project (competitively confidential).

Exhibit 3D details the estimated cost per MWh above conventional generation for each existing and planned renewable generation project (competitively confidential).

### Exhibit 3A: APS Existing and Planned Generation (MWh)

	2010	2011	2012	2013	2014	2010-2014 Total
<b>Existing Contracts:</b>						
<i>Solar:</i>						
APS-Owned PV <sup>(1)</sup>	15,413	15,413	15,413	15,413	15,413	77,065
Saguaro CSP (APS-Owned)	2,015	2,015	2,015	2,015	2,015	10,075
Solana CSP	-	-	742,572	903,349	903,349	1,645,921
Starwood CSP	-	-	407,203	918,234	918,234	1,325,437
<b>Total Solar</b>	<b>17,428</b>	<b>17,428</b>	<b>1,167,203</b>	<b>1,839,011</b>	<b>1,839,011</b>	<b>3,058,498</b>
<i>Wind:</i>						
Aragonne Mesa	269,239	269,239	269,239	269,239	269,239	1,346,195
High Lonesome	299,592	299,592	299,592	299,592	299,592	1,497,960
Total Wind	568,831	568,831	568,831	568,831	568,831	2,844,155
<i>Geothermal:</i>						
CE Turbo	78,174	78,174	78,174	78,174	78,174	390,870
Total Geothermal	78,174	78,174	78,174	78,174	78,174	390,870
<i>Biomass/Biogas:</i>						
Snowflake White Mountain Power <sup>(2)</sup>	71,686	64,248	55,056	23,016	17,186	231,192
Sexton City of Glendale Landfill	20,847	20,847	20,847	20,847	20,847	104,235
Total Biomass/Biogas	92,533	85,095	75,903	43,863	38,033	335,427
<b>Total Energy - Contracted Projects</b>	<b>756,966</b>	<b>749,528</b>	<b>740,336</b>	<b>1,858,071</b>	<b>2,524,049</b>	<b>6,628,950</b>
<b>Targeted Additions:</b>						
Wind Project 1	-	44,874	168,461	168,461	168,461	550,257
Solar Project 1	-	54,750	54,750	54,750	54,750	219,000
Solar Project 2	-	-	54,750	54,750	54,750	164,250
Small Generation <sup>(3)</sup>	22,100	45,000	45,000	45,000	45,000	202,100
<b>Total Energy - Targeted Additions</b>	<b>22,100</b>	<b>144,624</b>	<b>322,961</b>	<b>322,961</b>	<b>322,961</b>	<b>19,289,396</b>
<b>Total Generation</b>	<b>779,066</b>	<b>894,152</b>	<b>1,063,297</b>	<b>2,181,032</b>	<b>2,847,010</b>	<b>25,918,346</b>

**Notes:**

- (1) Includes the RES multiplier for in-state solar installation prior to 12/31/2005.
- (2) As noted in Exhibit 2A, this project is split between Renewable Generation and Distributed Energy. As the DE MWh requirement increases, the amount shown here as allocated to RG decreases.
- (3) Energy is the aggregate of all prospective projects for this category and is an estimate only at this time.

### Exhibit 3B: APS Existing and Planned Generation Capacity (MW)

	2010	2011	2012	2013	2014
<b>Existing Contracts:</b>					
<b>Solar:</b>					
APS-Owned PV <sup>(1)</sup>	5	5	5	5	5
Saguaro CSP (APS-Owned)	1	1	1	1	1
Solana CSP	-	-	-	283	283
Starwood CSP	-	-	-	287	287
<b>Total Solar</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>576</b>	<b>576</b>
<b>Wind:</b>					
Aragonne Mesa	90	90	90	90	90
High Lonesome	100	100	100	100	100
Total Wind	190	190	190	190	190
<b>Geothermal:</b>					
CE Turbo	10	10	10	10	10
Total Geothermal	10	10	10	10	10
<b>Biomass/Biogas:</b>					
Snowflake White Mountain Power <sup>(2)</sup>	15	15	15	10	10
Sexton City of Glendale Landfill	3	3	3	3	3
Total Biomass/Biogas	18	18	18	13	13
<b>Total Energy - Contracted Projects</b>	<b>224</b>	<b>224</b>	<b>224</b>	<b>789</b>	<b>789</b>
<b>Targeted Additions:</b>					
Wind Project 1	-	75	75	75	75
Solar Project 1	-	25	25	25	25
Solar Project 2	-	-	25	25	25
Small Generation <sup>(3,4)</sup>	20	20	20	20	20
<b>Total Energy - Targeted Additions</b>	<b>20</b>	<b>120</b>	<b>145</b>	<b>145</b>	<b>145</b>
<b>Total Generation</b>	<b>244</b>	<b>344</b>	<b>369</b>	<b>934</b>	<b>934</b>

**Notes:**

- (1) APS Solar capacity shown here in MW AC.
- (2) As noted in Exhibit 2A, this project is split between Renewable Generation and Distributed Energy. This Exhibit shows Snowflake's full capacity.
- (3) Actual technology, capacity, energy and cost may vary depending on the results of the procurement effort.
- (4) Capacity is the aggregate of all prospective projects for this category and is an estimate only at this time.

Redacted

**Exhibit 3C: APS Cost Above Conventional Generation (\$ MM)**

	2010	2011	2012	2013	2014	2010-2014 Total
<b>Existing Contracts:</b>						
<b>Solar:</b>						
APS-Owned PV <sup>(1)</sup>	n/a	n/a	n/a	n/a	n/a	n/a
Saguato CSP (APS-Owned) <sup>(1)</sup>	n/a	n/a	n/a	n/a	n/a	n/a
Solana CSP						
Starwood CSP						
<b>Total Solar</b>						
<b>Wind:</b>						
Aragonne Mesa						
High Lonesome						
<b>Total Wind</b>						
<b>Geothermal:</b>						
CE Turbo						
<b>Total Geothermal</b>						
<b>Biomass/Biogas:</b>						
Snowflake White Mountain Power <sup>(2)</sup>						
Sexton City of Glendale Landfill						
<b>Total Biomass/Biogas</b>						
<b>Total Energy - Contracted Projects</b>						
<b>Targeted Additions:</b>						
Wind Project 1						
Solar Project 1						
Solar Project 2						
Small Generation <sup>(3,4)</sup>						
<b>Total Energy - Targeted Additions</b>						
<b>Total Generation</b>	\$ 8.5	\$ 16.3	\$ 28.7	\$ 75.6	\$ 103.9	\$ 233.1

**Notes:**

- (1) Project is APS owned and was funded by customers under the EPS. There is no recurring contract cost to be funded by the RES.
- (2) As noted in Exhibit 2A, this project is split between Renewable Generation and Distributed Energy. Total cost as depicted in this Exhibit is net of the dollars allocated to Distributed Energy.
- (3) Actual technology, capacity, energy and cost may vary depending on the results of the procurement effort.
- (4) Aggregate of all prospective projects for this category and is an estimate only at this time.

**Redacted**

**Exhibit 3D: APS Cost per MWh Above Conventional Generation (\$/MWh)**

	2010	2011	2012	2013	2014
<b>Existing Contracts:</b>					
<b>Solar:</b>					
APS-Owned PV					
Saguaro CSP (APS-Owned)					
Solana CSP					
Starwood CSP					
<b>Total Solar</b>					
<b>Wind:</b>					
Aragonne Mesa					
High Lonesome					
<b>Total Wind</b>					
<b>Geothermal:</b>					
CE Turbo					
<b>Total Geothermal</b>					
<b>Biomass/Biogas:</b>					
Snowflake White Mountain Power					
Sexton City of Glendale Landfill					
<b>Total Biomass/Biogas</b>					
<b>Targeted Additions:</b>					
Wind Project 1					
Solar Project 1					
Solar Project 2					
Small Generation (1)					

**Notes:**

(1) Aggregate of all prospective projects for this category and is only an estimate at this time.

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**Exhibit 4**

**Distributed Energy**

**Annual Budget Detail**

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**Exhibit 4 – Distributed Energy Annual Budget Detail**

Exhibit 4A details the annual incentive budget by residential and non-residential classification.

Exhibit 4B details the estimated energy contribution from existing and planned distributed generation projects.

Exhibit 4C details the estimated total cost of APS's production-based incentive program, including the requested lifetime authorization increases.

**Exhibit 4A: APS Distributed Energy Incentive Budget Detail (\$MM)**

	2010	2011	2012	2013	2014	2010-2014 Total
<b>Residential</b>						
Up-front Incentives:						
Incremental Growth	\$ 44.1	\$ 51.8	\$ 64.1	\$ 31.1	\$ 34.6	\$ 225.7
2009 Unreserved <sup>(1,2)</sup>	\$ -	n/a	n/a	n/a	n/a	\$ -
<b>Total Residential</b>	<b>\$ 44.1</b>	<b>\$ 51.8</b>	<b>\$ 64.1</b>	<b>\$ 31.1</b>	<b>\$ 34.6</b>	<b>\$ 225.7</b>
<b>Non-Residential</b>						
Contracts:						
Production-based Incentives <sup>(3)</sup>	\$ 12.0	\$ 15.4	\$ 15.4	\$ 15.4	\$ 15.4	\$ 73.6
Distributed Energy RFP	\$ 1.3	\$ 8.3	\$ 11.3	\$ 13.3	\$ 13.4	\$ 47.6
Wholesale <sup>(4)</sup>	\$ 0.4	\$ 0.6	\$ 0.8	\$ 0.9	\$ 1.1	\$ 3.8
Customer Self-Directed <sup>(5)</sup>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-Residential Expansion:						
Production-based Incentives <sup>(6)</sup>	\$ 2.9	\$ 8.6	\$ 14.3	\$ 20.0	\$ 25.7	\$ 71.5
Up-front Incentives	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 10.0
2009 Unreserved <sup>(1,2)</sup>	\$ -	n/a	n/a	n/a	n/a	\$ -
<b>Total Non-Residential</b>	<b>\$ 18.6</b>	<b>\$ 34.9</b>	<b>\$ 43.8</b>	<b>\$ 51.6</b>	<b>\$ 57.6</b>	<b>\$ 206.5</b>
<b>Total Distributed Energy Incentives</b>	<b>\$ 62.7</b>	<b>\$ 86.7</b>	<b>\$ 107.9</b>	<b>\$ 82.7</b>	<b>\$ 92.2</b>	<b>\$ 432.2</b>

**Notes:**

- (1) Funds collected in 2009 but not yet allocated specific projects.
- (2) Collected but unallocated funds cannot be accurately calculated at the time of the July 1 filing. APS will update the amount prior to Commission consideration of the Implementation Plan.
- (3) Existing PBI Commitments up to the requested \$220 million lifetime authorization.
- (4) This line item is made up of a project (Snowflake White Mountain Power) that is split between Renewable Generation and Distributed Energy.
- (5) As discussed in the Implementation Plan, no customers have requested self-direction and therefore no allocation has been made.
- (6) Non-residential program expansion of \$100 million per year lifetime authorization. Estimated annual incentive payments based on an assumed mix of technologies and credit purchase agreement term lengths.

**Exhibit 4B: APS Distributed Energy Budget Detail (MWh)**

	2010	2011	2012	2013	2014	2010-2014 Total
<b>Residential</b>						
Up-front Incentives:						
Pre-2010 projects <sup>(1)</sup>	44,064	44,064	44,064	44,064	44,064	220,322
Incremental Growth <sup>(2)</sup>	28,474	65,660	111,620	137,793	166,946	510,493
Community Power Project	902	902	902	902	902	4,508
<b>Total Residential</b>	<b>73,440</b>	<b>110,626</b>	<b>156,586</b>	<b>182,759</b>	<b>211,912</b>	<b>735,323</b>
<b>Non-Residential</b>						
Contracts:						
Production-based Incentives <sup>(3)</sup>	80,515	80,515	80,515	80,515	80,515	402,575
Distributed Energy RFP	10,320	80,310	106,087	135,701	134,959	467,378
Wholesale <sup>(4)</sup>	14,688	22,125	31,317	36,552	42,382	147,064
Customer Self-Directed <sup>(5)</sup>	0	0	0	0	0	0
Community Power Project	720	990	990	990	990	4,678
Non-Residential Expansion:						
Production-based Incentives <sup>(6)</sup>	31,744	63,489	95,233	126,978	158,722	476,167
Up-front Incentives	2,011	4,247	6,483	9,114	11,745	33,600
<b>Total Non-Residential</b>	<b>139,998</b>	<b>251,676</b>	<b>320,625</b>	<b>389,850</b>	<b>429,312</b>	<b>1,531,461</b>
<b>Total Distributed Energy (MWh)</b>	<b>213,438</b>	<b>362,302</b>	<b>477,211</b>	<b>572,608</b>	<b>641,224</b>	<b>2,266,785</b>

**Notes:**

- (1) Estimated total energy resulting from incentives paid with funds through 2009.
- (2) Energy resulting from projects developed using incentives collected and paid from 2010 forward.
- (3) Existing PBI Commitments up to the requested \$220 million lifetime authorization. Capacity to generate 45,104 MWh/yr is projected to be in place by YE 2009.
- (4) This line item is made up of a project (Snowflake White Mountain Power) that is split between Renewable Generation and Distributed Energy. The split is based on the amount of the wholesale component in a given year.
- (5) As discussed in the Implementation Plan no customers have requested self-direction and therefore no allocation has been made.
- (6) Non-residential program expansion of \$100 million per year lifetime authorization. Estimated annual incentive payments based on an assumed mix of technologies and credit purchase agreement term lengths.

**Exhibit 4C: PBI Commitment (In Thousands)**

	2007	2008	2009	2010	2011	2012	2013	2014
<b>New PBI Contracts:</b>								
PBI Annual Commitment (up to \$77 million lifetime authorization)	\$ 93	\$ 789	\$ 5,508					
PBI Annual Commitment (additional \$143 million lifetime authorization) <sup>(1)</sup>			\$ 2,327	\$ 6,653				
PBI Annual Commitment (additional \$100 million lifetime authorization) <sup>(2,3)</sup>				\$ 5,714				
PBI Annual Commitment (additional \$100 million lifetime authorization) <sup>(2,3)</sup>					\$ 5,714			
PBI Annual Commitment (additional \$100 million lifetime authorization) <sup>(2,3)</sup>						\$ 5,714		
PBI Annual Commitment (additional \$100 million lifetime authorization) <sup>(2,3)</sup>							\$ 5,714	
PBI Annual Commitment (additional \$100 million lifetime authorization) <sup>(2,3)</sup>								\$ 5,714
Anticipated Fraction Produced in Year	N/A	N/A	N/A	50%	50%	50%	50%	50%
<b>Cash Commitment for New PBIs</b>				<b>\$ 6,184</b>	<b>\$ 2,857</b>	<b>\$ 2,857</b>	<b>\$ 2,857</b>	<b>\$ 2,857</b>
<b>Existing PBI Contracts:</b>								
2006 Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2007 Contracts	\$ 93	\$ 93	\$ 93	\$ 93	\$ 93	\$ 93	\$ 93	\$ 93
2008 Contracts		\$ 789	\$ 789	\$ 789	\$ 789	\$ 789	\$ 789	\$ 789
2009 Contracts				\$ 7,835	\$ 7,835	\$ 7,835	\$ 7,835	\$ 7,835
2010 Contracts					\$ 12,367	\$ 12,367	\$ 12,367	\$ 12,367
2011 Contracts						\$ 5,714	\$ 5,714	\$ 5,714
2012 Contracts							\$ 5,714	\$ 5,714
2013 Contracts								\$ 5,714
<b>DE RFP</b>				<b>\$ 1,340</b>	<b>\$ 8,303</b>	<b>\$ 11,321</b>	<b>\$ 13,268</b>	<b>\$ 13,409</b>
<b>Annual Cash Commitment for All PBIs</b>	<b>\$ -</b>	<b>\$ 93</b>	<b>\$ 882</b>	<b>\$ 16,241</b>	<b>\$ 32,244</b>	<b>\$ 40,976</b>	<b>\$ 48,637</b>	<b>\$ 54,492</b>
<b>Cumulative authorization Commitment up to \$220 Million</b>	<b>\$ 930</b>	<b>\$ 8,822</b>	<b>\$ 117,193</b>	<b>\$ 220,000</b>				
<b>Cumulative authorization Commitment \$500 Million Expansion</b>				<b>\$ 100,000</b>	<b>\$ 200,000</b>	<b>\$ 300,000</b>	<b>\$ 400,000</b>	<b>\$ 500,000</b>
<b>Cumulative authorization Commitment DE RFP</b>				<b>\$ 250,000</b>				
<b>Cumulative Lifetime Commitment for All PBIs</b>	<b>\$ 930</b>	<b>\$ 8,822</b>	<b>\$ 117,193</b>	<b>\$ 570,000</b>	<b>\$ 670,000</b>	<b>\$ 770,000</b>	<b>\$ 870,000</b>	<b>\$ 970,000</b>

**Notes:**

- (1) Additional PBI lifetime authorization requested above that approved in APS' 2009 Implementation plan for a total of \$220 million.
- (2) Future PBI annual commitments are for the expansion of the non-residential distributed energy program.
- (3) Future PBI annual commitments for non-residential expansion are assumptions based on expected project mix and CPP agreement term lengths.

**APS Renewable Energy Standard  
Implementation Plan for 2010-2014  
July 1, 2009**

**Exhibit 5**

**Distributed Energy**

**Assumptions  
&  
Projected Program Outcomes**

**APS Renewable Energy Standard  
Implementation Plan for 2010-2014  
July 1, 2009**

Exhibit 5 – Distributed Energy Assumptions and Projected Program Outcomes

Exhibit 5A details resource and customer participation assumptions used to develop the distributed energy budget.

Exhibit 5B summarizes the expected distributed energy program outcomes by dollars, energy, and capacity.

Exhibit 5C details the expected distributed energy program outcomes by technology.



**Exhibit 5B: APS Distributed Energy Projected Program Outcomes**

	2010	2011	2012	2013	2014
<b>Annual Incentive Cost (\$000s)</b>					
Residential UFI	44,096	51,829	64,058	31,065	34,603
Residential PBI	-	-	-	-	-
<i>Sub-Total Residential</i>	<u>44,096</u>	<u>51,829</u>	<u>64,058</u>	<u>31,065</u>	<u>34,603</u>
Non-Residential UFI	2,000	2,000	2,000	2,000	2,000
Non-Residential PBI	4,200	16,900	25,600	33,300	39,100
<i>Sub-Total Non-Residential</i>	<u>6,200</u>	<u>18,900</u>	<u>27,600</u>	<u>35,300</u>	<u>41,100</u>
<b>Total Residential and Non-Residential</b>	<b>50,296</b>	<b>70,729</b>	<b>91,658</b>	<b>66,365</b>	<b>75,703</b>
UFI	46,096	53,829	66,058	33,065	36,603
PBI	4,200	16,900	25,600	33,300	39,100
Existing PBI Commitments	12,043	15,370	15,370	15,370	15,370
<b>Total UFI &amp; PBI</b>	<b>62,340</b>	<b>86,099</b>	<b>107,028</b>	<b>81,735</b>	<b>91,073</b>
<b>Total Wholesale</b>	<b>363</b>	<b>564</b>	<b>822</b>	<b>945</b>	<b>1,129</b>
<b>Total Incentives and Wholesale</b>	<b>62,703</b>	<b>86,662</b>	<b>107,850</b>	<b>82,680</b>	<b>92,202</b>
<b>Annual Energy Production (MWHs)</b>					
Residential	73,440	110,626	156,586	182,759	211,912
Non-Residential	125,310	229,551	289,308	353,298	386,930
Wholesale	14,688	22,125	31,317	36,552	42,382
<b>Total Residential and Non-Residential</b>	<b>213,438</b>	<b>362,302</b>	<b>477,211</b>	<b>572,608</b>	<b>641,224</b>
UFI	75,451	114,873	163,069	191,873	223,657
PBI	123,299	225,304	282,825	344,184	375,185
<b>Total UFI &amp; PBI</b>	<b>198,750</b>	<b>340,177</b>	<b>445,894</b>	<b>536,056</b>	<b>598,842</b>
<b>Incremental Installed Capacity (kW)</b>					
Residential UFI	13,396	16,810	20,776	11,831	13,178
Residential PBI	-	-	-	-	-
<i>Sub-Total Residential</i>	<u>13,396</u>	<u>16,810</u>	<u>20,776</u>	<u>11,831</u>	<u>13,178</u>
Non-Residential UFI	1,208	967	667	785	785
Non-Residential PBI	51,575	56,850	68,850	81,850	81,850
<i>Sub-Total Non-Residential</i>	<u>52,783</u>	<u>57,817</u>	<u>69,517</u>	<u>82,635</u>	<u>82,635</u>
<b>Total Residential and Non-Residential</b>	<b>66,179</b>	<b>74,627</b>	<b>90,293</b>	<b>94,466</b>	<b>95,813</b>
<b>Cumulative Total</b>					
Residential	13,396	30,206	50,982	62,813	75,991
Non-Residential	52,783	110,600	180,117	262,752	345,387
<b>Total Residential and Non-residential</b>	<b>66,179</b>	<b>140,806</b>	<b>231,099</b>	<b>325,565</b>	<b>421,378</b>
<b>Cumulative Installed Capacity (kW)</b>					
Residential UFI	13,396	30,206	50,982	62,813	75,991
Residential PBI	-	-	-	-	-
<i>Sub-Total Residential</i>	<u>13,396</u>	<u>30,206</u>	<u>50,982</u>	<u>62,813</u>	<u>75,991</u>
Non-Residential UFI	1,208	2,175	2,842	3,627	4,412
Non-Residential PBI	51,575	108,425	177,275	259,125	340,975
<i>Sub-Total Non-Residential</i>	<u>52,783</u>	<u>110,600</u>	<u>180,117</u>	<u>262,752</u>	<u>345,387</u>
<b>Total Residential and Non-Residential</b>	<b>66,179</b>	<b>140,806</b>	<b>231,099</b>	<b>325,565</b>	<b>421,378</b>
UFI	14,604	32,381	53,824	66,440	80,403
PBI	51,575	108,425	177,275	259,125	340,975
<b>Total UFI &amp; PBI</b>	<b>66,179</b>	<b>140,806</b>	<b>231,099</b>	<b>325,565</b>	<b>421,378</b>
<b>Incremental Number of Installations</b>					
Residential UFI	5,312	6,676	8,251	4,699	5,234
Residential PBI	-	-	-	-	-
<i>Sub-Total Residential</i>	<u>5,312</u>	<u>6,676</u>	<u>8,251</u>	<u>4,699</u>	<u>5,234</u>
Non-Residential UFI	50	42	41	48	48
Non-Residential PBI	39	43	47	47	32
<i>Sub-Total Non-Residential</i>	<u>89</u>	<u>85</u>	<u>88</u>	<u>95</u>	<u>80</u>
<b>Total Residential and Non-Residential</b>	<b>5,401</b>	<b>6,761</b>	<b>8,339</b>	<b>4,794</b>	<b>5,314</b>
<b>Cumulative Number of Installations</b>					
Residential UFI	5,312	11,988	20,240	24,939	30,173
Residential PBI	-	-	-	-	-
<i>Sub-Total Residential</i>	<u>5,312</u>	<u>11,988</u>	<u>20,240</u>	<u>24,939</u>	<u>30,173</u>
Non-Residential UFI	50	92	133	181	229
Non-Residential PBI	39	82	129	176	208
<i>Sub-Total Non-Residential</i>	<u>89</u>	<u>174</u>	<u>262</u>	<u>357</u>	<u>437</u>
<b>Total Residential and Non-Residential</b>	<b>5,401</b>	<b>12,162</b>	<b>20,502</b>	<b>25,296</b>	<b>30,610</b>
UFI	5,362	12,080	20,373	25,120	30,402
PBI	39	82	129	176	208
<b>Total UFI &amp; PBI</b>	<b>5,401</b>	<b>12,162</b>	<b>20,502</b>	<b>25,296</b>	<b>30,610</b>

Exhibit 5C: APS Distributed Energy Projected Program Outcomes by Technology

Residential or Non-Residential	2010			2011			2012			2013			2014		
	# Installs	MW/HE	MW												
<b>Residential</b>															
SMALL WIND Residential (off-grid)	33	142	65	42	186	85	52	230	105	30	131	60	33	146	67
SMALL WIND Residential (grid-tied)	130	559	260	170	744	340	210	919	420	120	523	239	133	593	266
PV Residential (grid-tied)	2,440	20,688	12,882	2,958	26,030	16,269	3,656	32,172	20,108	2,082	18,321	11,450	2,319	20,407	12,755
PV Residential (off-grid)	44	142	88	58	188	116	72	230	144	41	131	82	46	146	91
SOLAR THERMAL/WATER HEATING (1)	2,665	7,834	10,640	3,448	10,640	-	4,261	12,409	-	2,427	7,066	-	2,703	7,871	-
<b>Total Residential Incremental</b>	<b>5,312</b>	<b>29,376</b>	<b>13,088</b>	<b>6,676</b>	<b>37,188</b>	<b>16,810</b>	<b>6,251</b>	<b>45,860</b>	<b>26,776</b>	<b>4,699</b>	<b>26,172</b>	<b>11,631</b>	<b>6,234</b>	<b>26,153</b>	<b>13,173</b>
<b>Non-Residential</b>															
BIOMASS/BIOGAS (electric)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIOGAS/BIOMASS - CHP (electric)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIOGAS/BIOMASS - CHP (thermal)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIOMASS/BIOGAS (thermal)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIOMASS/BIOGAS (cooling)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON-RESIDENTIAL DAYLIGHTING (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reserved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GEOTHERMAL - (electric)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GEOTHERMAL - (thermal)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reserved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PV NON-RESIDENTIAL - small	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PV NON-RESIDENTIAL (grid-tied)	78	79,078	52,775	77	103,006	57,817	60	56,522	68,517	86	62,537	82,635	71	32,180	82,635
PV NON-RESIDENTIAL (off-grid)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SMALL WIND Non-Residential (grid-tied)	4	18	8	-	-	-	-	-	-	-	-	-	-	-	-
SMALL WIND Non-Residential (off-grid)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLAR SPACE COOLING	7	1,111	-	8	1,235	-	-	1,235	-	9	1,453	-	9	1,453	-
SOLAR WATER HEATING/SPACE HEATING (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NON-RESIDENTIAL POOL HEATING (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Non-Residential Incremental</b>	<b>89</b>	<b>80,206</b>	<b>62,783</b>	<b>85</b>	<b>104,241</b>	<b>57,817</b>	<b>66</b>	<b>67,757</b>	<b>68,517</b>	<b>95</b>	<b>63,990</b>	<b>82,635</b>	<b>80</b>	<b>33,633</b>	<b>82,635</b>
<b>Wholesale</b>															
<b>Total Incremental</b>	<b>5,401</b>	<b>124,270</b>	<b>65,179</b>	<b>6,761</b>	<b>163,852</b>	<b>74,627</b>	<b>6,339</b>	<b>137,034</b>	<b>90,293</b>	<b>4,794</b>	<b>128,714</b>	<b>94,466</b>	<b>5,314</b>	<b>106,166</b>	<b>95,813</b>

(1) System capacity and size is depicted in kW as these items are not electrical generators.

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**Arizona Public Service Company**

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**Arizona Public Service**

**Distributed Energy**

**Administration Plan**

**July 1, 2009**

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### ATTACHED EXHIBITS

- Exhibit 1      Distributed Energy Incentives
- Exhibit 2      Solar Space Heating Incentive Calculator
- Exhibit 3      Standard Project PBI Ranking Calculator
- Exhibit 4      PV Off-Angle and Shading Adjustment Table

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### ARIZONA PUBLIC SERVICE CORPORATION 2009 DISTRIBUTED ENERGY ADMINISTRATION PLAN

#### 1. OVERVIEW

APS is submitting this updated Distributed Energy Administration Plan (“DEAP” or “Plan”) for Commission approval as part of its 2010 Implementation Plan. APS has made only minor adjustments to the DEAP that was approved as part of the Company’s 2009 RES Implementation Plan.<sup>1</sup>

The RES requires that a portion of the renewable energy requirements be obtained from distributed energy (“DE”), and that the installed resources result from residential systems and non-residential systems in equal proportions. As part of its RES Implementation Plan, APS describes the installation of DE systems as facilitated by providing customers with financial incentives for the installation of those resources through APS’s Renewable Energy Incentive Program (“REIP”).

Arizona Corporation Commission (“Commission” or “ACC”) Staff initiated the Uniform Credit Purchase Program (“UCPP”) working group in June 2006, and APS participated in all of the working group efforts. The working group made significant progress towards the development of recommendations to Commission Staff, but a final report has not yet been completed. The working group made considerable progress towards identifying program workflows, technology sensitive incentive structures and levels, and technology specific requirements and limitations. APS will use the approach and technology requirements developed by the UCPP working group for this Plan. If, in the future, the Commission adopts UCPP requirements differing from those implemented as part of this Plan, this Plan may require amendment.

The efforts of the working group also provided APS with insight on the anticipated potential contributions from technologies not previously included in APS’s DE programs. This Plan and the associated planning models, implementation strategies, and budgeting for the DE program were all designed with specific consideration of the insights provided by the UCPP working group. In addition, in developing the DEAP, APS relied on over five years experience with the Solar Partners Incentive program, ongoing dialogue with many industry stakeholders, and more recently its experience with the REIP.

This Plan details the process by which customers will obtain incentives; the requirements associated with the selection, installation, and operation of the DE system; and the measurement of DE performance for compliance reporting and program evaluation. This Plan is designed to provide uniformity and consistency in the administration of APS’s DE program.

As part of the RES, the energy generated or displaced by the DE system is applied towards the DE percentage of the utility’s renewable energy requirement.<sup>2</sup> The unit used to track kilowatt hours (“kWh”) derived from renewable resources for purposes of compliance with the RES is the

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<sup>1</sup> Decision No. 70654 (December 12, 2008).

<sup>2</sup> A.A.C. R14-2-1805(B).

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Renewable Energy Credit (“REC”).<sup>3</sup> One REC equals one kWh or kWh equivalent for systems that do not generate electricity.

This Plan will ensure that each customer with eligible technology will be afforded the opportunity to obtain a reservation. The processes described herein are based on technologies and systems with which APS has considerable experience; technologies, incentive configurations, and development models which are newly incorporated may require special consideration until new implementation strategies and methods can be defined.

The following DE technologies are eligible for incentives:

- Biogas Electricity Generator, Biomass Electricity Generator
- Grid-tied and Off-grid Solar Photovoltaic Generators (“PV”)
- Biomass Thermal Systems and Biogas Thermal Systems
- Non-residential Solar Pool Heating Systems
- Geothermal Space Heating and Process Heating Systems
- Geothermal Electricity Generator
- Renewable Combined Heat and Power System (“CHP”)
- Non-residential Solar Daylighting
- Solar Heating, Ventilation, and Air Conditioning (“Solar HVAC”)
- Solar Industrial Process Heating and Cooling
- Solar Space Cooling
- Solar Space Heating
- Solar Water Heater
- Grid-tied and Off-grid Wind Generators of 1 megawatt (“MW”) or less
- Fuel Cells that use only renewable fuels
- New Hydropower Generators of 10 MW or less

## 2. PROJECT CATEGORIES

There are three project categories described by this Plan: Standardized projects, Market-Based projects, and Customer Self-Directed projects.

### 2.1 Standardized Projects

Unless noted otherwise in this Plan, all information contained herein applies to the administration of standardized projects. By definition, standardized projects follow the procedures and incentives described in this Plan. Incentives available for these projects are described in Exhibit 1. APS anticipates that the vast majority of projects facilitated by this Plan will be standardized projects. The processes described for the standard projects are based on technologies and systems with which APS has considerable experience; technologies and incentive configurations which are newly incorporated may require special consideration until new implementation strategies and methods can be developed.

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<sup>3</sup> A.A.C. R14-2-1801(N) – ““Renewable Energy Credit” means the unit created to track kWh derived from an Eligible Renewable Resource of kWh equivalent of Conventional Energy Resource displaced by Distributed Renewable Resources.”

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### 2.2 Market-Based Projects

Since considerable uncertainty exists with respect to this Plan's ability to meet all expected project variations with standardized incentive offerings, APS believes it is appropriate to fund market-based projects during each program year. That funding will be applied to projects which, for one reason or another, cannot comply with the requirements of the standardized incentive offerings. APS may also solicit market-based projects to meet specific program goals. For example, although the DEAP attempts to identify and accommodate a large range of potential DE project types, financing options, and system host alternatives, specific shortcomings were identified in the proposed approach. Those shortcomings include concerns for increasing cost effectiveness of residential incentives, facilitating installations for multi-tenant residential developments, and challenging DE developers to look at creative mechanisms by which to address the residential DE market.

Projects with staged completion dates, multi-participant or multi-system projects, projects involving more than one technology where an interrelated incentive was not developed, projects requiring new or unique agreement terms, or projects requiring timelines differing from those detailed in this Plan may be eligible for incentives as part of the DEAP. In addition, this Plan does not identify incentives for fuel cells and small hydroelectric facilities; those technologies may also be eligible for incentives as market-based projects.

Market-based projects must achieve similar financial efficiency as the standardized projects detailed in this Plan to be eligible for incentives. Incentives applied for market-based projects must meet the lower of: 1) the maximum allowable incentive for the proposed technology as described in the applicable incentive matrix attached as Exhibit 1; or 2) the average incentive of projects accepted by APS for disbursement for the proposed technology in the previous year. Some qualifying technologies will not have either of the previously described financial efficiency measures. Participants seeking to employ those technologies will work with APS to develop an appropriate incentive.

### 2.3 Customer Self-Directed

The Customer Self-Directed project funding option is available to eligible customers.<sup>4</sup> The eligible customer must declare that it will self-direct on or before March 31 of the year prior to the year for self-direction. Customer Self-Directed funds can only be requested for prospective years, they cannot include prior year payments, and they cannot exceed the level of funding paid by the eligible customer towards the RES in the year prior to the requested allocation.

In order to be eligible for the incentives detailed in this Plan (Exhibit 1), Customer Self-Directed projects must achieve similar financial efficiency as the standardized and market-based projects discussed above. If the eligible customer wishes to apply Customer Self-Directed funds to a DE system or another application not described in the applicable Incentive Matrix, the customer must submit documentation describing the project economics and the requested incentive level. All projects proposed for Customer Self-Directed funding must meet the requirements described in the RES.<sup>5</sup>

<sup>4</sup> A.A.C. R14-2-1801(H). – “Eligible Customer” means an entity that pays Tariff funds of at least \$25,000 annually for any number of related accounts or services within an Affected Utility's service area.”

<sup>5</sup> A.A.C. R14-2-1809(B).

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Eligible customers who have facilities in the service territories of more than one affected utility can only apply for funds from APS that were collected by APS. The funds obtained from APS can only be used for projects in APS's service territory. Customer Self-Directed projects are also subject to the general requirements set forth in this Plan including installation, operation, REC exchange, and system performance reporting.

For purposes of financing DE projects, funds for Customer Self-Directed projects may be assigned to third parties. Such assignment remains the sole right of the customer.

### **2.4 General**

Under some circumstances, such as for new residential or non-residential construction, a project may not identify the Participant at project initiation. Regardless of the project design, implementation, or timeline, a Participant must have installed a system that is ready for commissioning and, if grid-tied, have established an account to receive electrical service from APS before the incentive will be paid.

### **3. INCENTIVE TYPES**

The DE Program offers two standard incentive options: Up-front Incentives ("UFI") and Production-Based Incentives ("PBI").

UFIs are those incentives where the Participant receives a one time payment based on the DE system's designed capacity, or a one time payment based on the first-year energy savings provided by the DE system. This type of incentive is applied to smaller non-residential installations and for all standard residential installations. PBIs allow the Participant to collect incentive payments in direct relation to the actual system production. Those payments are received by the Participant over time and are based on an agreed upon contract term.

Incentive levels for both UFIs and PBIs are detailed in three incentive matrices included in Exhibit 1. Each incentive matrix prescribes a decline from the incentive levels detailed for the preceding period of the program. Those declines were discussed in detail as part of Commission Staff's UCPP Working Group. In general, the declining incentive levels are designed to reflect several key expectations of the DE markets, which include: declining costs of DE technologies; economic efficiency resulting from increased demand on the DE technologies; and increased availability of equipment required in the development of DE systems.

### **4. PROGRAM REQUIREMENTS**

Requirements detailed in this Plan are designed to provide clarity for program Participants and DE developers; increase the certainty of energy generation and as a result, production of the RECs for APS's compliance with the RES; and to ultimately drive cost-effectiveness for the DE requirement in the RES.

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### 4.1 General

This program is designed to facilitate Participant installation of DE resources to displace Conventional Energy Resource<sup>6</sup> usage. REIP incentives are designed to defray a portion of the costs associated with the installation of DE resources for the program "Participant." The Participant is either the account holder for the APS billing meter at the project site or the party holding legal right to the property in APS territory where the DE system will be located. Systems must be located on the Participant's property. All systems must be in APS territory. A project developer that builds an eligible DE system that provides a portion of the system's energy output to a non-Participant must provide metering to document the energy produced by the DE system that is received specifically by the program Participant.

Funding is not guaranteed without written confirmation of a reservation from APS. The Participant must follow the reservation procedure outlined in this Plan for APS to set allocated incentive dollars for the specific DE system proposed. If a Participant is receiving electrical service from APS, the Participant must not be delinquent in payments to the Company before an incentive payment can be issued.

Specific funding allocations are used to implement the DE incentive program. Once funds have been exhausted in any one category of this program, a Participant applying for funding within that category may be placed on a waiting list.

#### 4.1.1 Reservations for New Construction

Reservations can be made for systems that will be installed as part of new residential or non-residential construction. Prior to receipt of a program incentive, a Participant must have installed a system that is ready for commissioning and, if grid-tied, have established an account to receive electrical service from APS before the incentive will be paid.

### 4.2 Installation and Equipment Specifications

Systems receiving incentives under this program must be installed according to manufacturers' recommendations and generally accepted industry standards. Installation of the system must be completed by an installer meeting the requirements described in Section 5.1 "Installer Qualifications." The dealer for the system must meet the requirements described in Section 5.2 "Dealer Qualifications." Other requirements which are applicable under this Plan include, but are not limited to, the following:

- The project must comply with all applicable local, state, and federal regulations.
- Installations must meet applicable governmental statutes, codes, ordinances, and accepted engineering and installation practices.
- Systems must be permitted with and pass inspection by the Authority Having Jurisdiction (AHJ) over construction projects in the Participant's locale, or, if

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<sup>6</sup> A.A.C. R14-2-1801(C) – "Conventional Energy Resource" means an energy resource that is non-renewable in nature, such as natural gas, coal, oil, and uranium, or electricity that is produced with energy resources that are not Renewable Energy Resources."

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the site is not governed by an AHJ, the Participant must provide a certification in lieu of AHJ clearance.

- If the inverter of the DE system is interconnected or in any way connected to the APS grid – a “Grid-Tied System” – the system must meet all applicable APS Interconnection Requirements.
- APS may request copies of any documents to assure compliance with government, institutional, or DE program requirements that are either explicitly or implicitly described by this Plan.

If any of the requirements described in this Plan conflict with APS approved rate schedules, or government or other institutional requirements listed above, the conflicting requirements in this Plan may not be imposed.

All major components of the DE system must be new and must not have been previously placed in service in any other location or for any other application. A DE system purchased more than 180 days before the date that APS receives the reservation request will not be considered “new” under this Plan. APS may consider exceptions to this timeframe when justified by the Participant in writing. The DE system must also comply with the technology specific criteria detailed below. When technology-specific criteria reference third party standards, the requirements of those standards are fully applicable when referenced as part of technology specific criteria.

The rapid growth in national and international renewable energy programs is resulting in greater need for the development of standardization in design, performance measurement, system integrity/longevity/maintenance, and installation techniques. New standards are likely to develop in the near future for technologies included in the DE program, and APS reserves the right to incorporate new standards into plan requirements as necessary and appropriate. The following standards or standard development bodies are referenced as part of the technology specific criteria.

- The Active Solar Heating Systems Design Manual developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (“ASHRAE”) in cooperation with the Solar Energy Industries Association (“SEIA”) and the ACES Research and Management Foundation (the “Design Manual”).
- Arizona state boiler regulations (A.A.C. R20-5-401 to R20-5-420).
- Select technology specific qualification requirements developed by the California Energy Commission (“CEC”).
- Solar Rating and Certification Corporation (“SRCC”). The SRCC criteria and ratings can be viewed at [www.solar-rating.org](http://www.solar-rating.org).
- The Underwriters Laboratory (“UL”).

The technology standards are relied upon, in part, to develop a clear understanding of the DE system capacity or the expected energy production. Incentives offered under this program are based on system capacity and energy production. Therefore, to encourage transparency in program transaction and clarity for Participants, current and accurate technology standards are fundamental to the program’s success.

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Some technologies included as DE under the RES tend to be designed as custom applications and vary from installation to installation. In other cases, technologies are generally standardized for all installations. In these situations, installation standards have been published under the end-use application. If no technology specific standard is referenced, at a minimum, to qualify for DE incentives, an Energy Savings and Designed Output (“ES&D”) report shall be provided as part of the reservation process.

The ES&D report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory, or an engineering report stamped by a registered professional engineer. The ES&D report shall provide a description of the system and major components, designed performance, system output, and a brief history of the components used in similar applications. If the system design differs from the recognized industry best practices, as described in the equipment qualifications listed in the Plan for the qualifying technology, the ES&D report must contain a certification that the system design is at least as effective as the specified requirements.

Where the equipment qualifications detailed below are required for program participation, the technology specific installation guidance is provided to program participants to convey information on installation and operation practices that are most likely to achieve the DE system’s designed output. The requirements described herein are not intended as engineering recommendations, services, or technical advice. Engineering recommendations, design, and performance data will be provided to the Participant by their supplier, installer, or professional advisor. Although installation guidance is not currently mandated for a project to receive an incentive, it does reflect both industry and utility concurrence on those practices that are important for a technology to best achieve the designed output. APS reserves the right to modify equipment qualifications and/or installation guidance if APS becomes aware that such qualifications or guidance results in unsafe conditions, provides inappropriate results for our customer, or is inconsistent with program objectives.

### 4.2.1 Biomass/Biogas and CHP (Electric and Thermal) and Biomass/Biogas Cooling

#### Equipment Qualifications

- Systems must include a dedicated performance meter to allow for monitoring of the number of RECs produced.
- A complete ES&D report must be submitted. Biomass system installations involving a regulated boiler or pressure vessel are required to include in the ES&D report confirmation of conformance with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.

#### Installation Guidance

Because of the individual nature of biomass systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements, including but not limited to, air emission standards and air permit regulations.

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### 4.2.2 Non-residential Solar Daylighting

#### Equipment Qualifications

Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory, or by submitting an engineering reporting stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The report shall include such items as installed cost, energy savings (lighting savings only – no associated HVAC savings), lighting levels (artificial and daylighting), and control scheme methodology (lighting levels, savings, and control mechanism), as well as the inclusion the following components as part of the overall daylighting system design:

- A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
- A reflective light well to the interior ceiling or a minimum 12” below roof deck in open bay areas.
- An interior diffusion lens.
- A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
- If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) that are programmed to keep electric lights off during daylight hours.
- The system must provide a minimum of 70% of the light output of the artificial lighting system that would otherwise be used for all of the claimed period of energy savings, as measured in foot-candles.

#### Installation Guidance

All systems should be installed such that the skylight dome is substantially unshaded and have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### 4.2.3 Small Wind Generator

A small wind generator is a system with a nameplate rating of 1 (one) MW or less. The technology criteria described below are intended for small wind generators with a nameplate rating of 100kW or less. Systems larger than 100 kW will be required to submit a detailed package describing site selection, expected energy production, and an engineered system design and installation as part of an ES&D report.

#### Equipment Qualifications

The technology criteria described below are intended for wind generators with a nameplate rating of 100kW or less.

- Eligible small wind systems must be certified and nameplate rated by the CEC or other qualified third party selected by APS to provide certification and a nameplate rating. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid-tied or off-grid wind generators where an inverter is

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used, APS will use the lesser of the CEC Wind Turbine Power Output Rating or Inverter Power Rating as the basis for calculating the UFI payment.

- Grid-tied inverters used as part of the system shall be listed to Underwriters Laboratory standard UL 1741.
- The tower used in the installation must be designed by a registered professional engineer.
- The wind generator and system must include a five year warranty and an operation and maintenance plan for the full operational life of the system.

In addition to the requirements for small wind generators outlined above, systems nameplate rating larger than 100 kW will be required to submit an ES&D Report.

### Installation Guidance

*Location:* a wind turbine hub should be at least 20 feet above any surrounding object and at least 28 feet above the ground within a 250-foot radius. Wind generators should be installed in locations with an elevation at or above the general elevation of the surrounding terrain.

*Lot size:* should be at minimum one-half acre. Municipalities and public facilities, such as schools and libraries, may not need to meet the minimum lot size requirements.

The installed system should be demonstrated to obtain at least a 15% annual capacity factor. The following are readily available methods for helping to demonstrate the potential for a 15% capacity factor, but other methods may be used. The installation location should have a demonstrated average annual wind speed of at least 9 MPH as measured at a height of no more than 50 feet above the ground. Average annual wind speed can be demonstrated by wind speed records from an airport, weather station or university within 20 miles of the proposed wind generator location, or by a 50 meter wind power density classification of Class 2 "Marginal" or higher on the "State of Arizona Average Annual Wind Resource" map, dated July 16, 2005 or later, as published by Sustainable Energy Solutions of Northern Arizona University. Northern Arizona University provides detailed wind resource maps as well as other resource services. For more information contact Northern Arizona University at <http://wind.nau.edu/maps/>.

#### 4.2.4 Photovoltaic Systems

- All systems shall be installed with a horizontal tilt angle between 0 degrees and 60 degrees, and azimuth angle of +/- 110 degrees of due south. Since some installation alternates are less than ideal for energy production, some installation configurations for some systems receiving a UFI will not be eligible for the full incentive applicable to that system. APS will apply the PV off-angle and shading factor adjustment for the PV installation (Section 6.5).
- Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
- Inverters must be covered by a manufacturer's warranty of at least five years. The remaining operational life must be supported by a planned maintenance or equipment replacement schedule.

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### Grid-Tied Systems Equipment Qualifications

- The minimum PV array size shall be 1,000 W-DC.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
- All other electrical components used in the installation must be UL listed.
- The inverter must be listed to Underwriters Laboratories UL 1741

### Off-Grid Systems Equipment Qualifications

- The minimum, single-system PV array size shall be 200 W-DC.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of the UL Standard 1703.
- All other electrical components used in the installation must be UL listed.
- If the installation is an AC application, the inverter must be listed to Underwriters Laboratories UL 1741
- “As-built” drawings shall be submitted to APS upon completion of the project and shall include a plant location map.

### 4.2.5 Solar Space Cooling

#### Equipment Qualifications

- Submittal of a complete ES&D Report certifying:
  - The minimum cooling capacity of the system will be 120,000 BTU per hour (10 tons).
  - Solar collector panels used will have a SRCC OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.

#### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and the panel orientation should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### 4.2.6 Non-residential Solar Water Heating and Space Heating

#### Equipment Qualifications

Submittal of a complete ES&D Report that includes certification that solar collector panels used shall have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.

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### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and the panel orientation should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 am and 3 pm.

#### 4.2.7 Small Domestic Solar Water Heating

##### Equipment Qualifications

- Domestic Solar Water Heating systems must be rated by the SRCC and meet the OG-300 system standard.
- The 'high' limit shall be set at a maximum of 160 degrees Fahrenheit.
- Contractors must provide minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of two years for repair/replacement service to the Participant. The remaining operational life must be supported by a planned maintenance or equipment replacement schedule.
- Systems shall be selected and sized according to the geographic location and hot water needs of the specific application.
- Active, open-loop systems are not eligible for incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
- ICS systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation.

### Installation Guidance

- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 am and 3 pm.

#### 4.2.8 Small Domestic Solar Space Heating

##### Equipment Qualifications

- The system must be supported by a five year equipment warranty including a minimum warranty period of two years for repair/replacement service to the Participant. The remaining operational life must be supported by a planned maintenance or equipment replacement schedule.
- Submittal of a report verifying that:

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- The system will be incented based on a Solar Space Heating Incentive Calculation Procedure. The input sheet and description calculation procedure is attached as Exhibit 2 (APS will make the calculation procedure publicly available upon program implementation).
- The system will utilize OG-100 certified collectors.
- The solar space heating incentive calculation does not suggest or imply that a full energy audit is required to qualify for the solar space heating incentive. The intent is that industry professionals can utilize the calculation tool to aid in facilitating sound system design.

### Installation Guidance

- The system should be installed with a horizontal tilt angle between 20 degrees and 60 degrees, and azimuth angle of +/- 60 degrees of due south. It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested and flushed and refilled with new fluid as necessary, every five years, or per the manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that, through interaction with the materials of the proposed system, may reduce the expected operational life of the system components. The Participant should consider contacting the manufacturer to determine if warranty or operational life will be affected.
- In areas subject to snow accumulation, sufficient clearance should be provided to allow a 12" snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system should have an operation and maintenance manual at the Participant's site, and each Participant must complete an initial start up and operation training review with the contractor at the time of system start up.

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### 4.2.9 Residential Solar Thermal (Heating and Domestic Hot Water)

Residential Solar Thermal is a single system design that produces both space heating and water heating for residential use. An ES&D Report must be submitted that includes certification that solar collector panels used shall have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions. Report details should be broken out on a month-by-month basis, and should include the following: total solar production based on installation and location, total building BTU requirements, BTU space heating requirements, domestic hot water BTU requirements, and any other hot water BTU requirements.

#### Equipment Qualifications

- The system will utilize OG-100 certified collectors
- The system must be supported by a five year equipment warranty including a minimum warranty period of two years for repair/replacement service to the Participant. The remaining operational life must be supported by a planned maintenance or equipment replacement schedule.

#### Installation Guidance

- The system should be installed with a horizontal tilt angle between 20 degrees and 60 degrees, and azimuth angle of +/- 60 degrees of due south. It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested and flushed and refilled with new fluid as necessary, every five years, or per the manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that, through interaction with the materials of the proposed system, may reduce the expected operational life of the system components. The Participant should consider contacting the manufacturer to determine if warranty or operational life will be affected.

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- In areas subject to snow accumulation, sufficient clearance should be provided to allow a 12” snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system should have an operation and maintenance manual at the Participant’s site, and each Participant must complete an initial start up and operation training review with the contractor at the time of system start up.

### 4.2.10 Non-Residential Pool Heating

#### Equipment Qualifications

- Submittal of a complete ES&D Report.

### 4.2.11 Geothermal Space/Process Heating & Cooling

#### Equipment Qualifications

- A complete ES&D report must be submitted by the contractor and approved by APS prior to the installation.
- Equipment must be UL approved and meet the applicable Air Conditioning and Refrigeration Institute (ARI) Performance Certifications.
- Equipment must meet the following minimum efficiency requirements:
  - Closed Loop: 14.1 EER      3.3 COP
  - Open Loop: 16.2 EER      3.6 COP

#### Installation Guidance

- Ground loop systems must be installed by a contractor who holds a current International Ground Source Heat Pump Association (IGSHPA) certification.
- Wells must be permitted and drilled by a State of Arizona certified contractor.
- Contractors must hold a valid National Balancing Institute (NBI) or Building Performance Institute (BPI) certification.
- All systems should be designed (sized) and installed in accordance to the Air Conditioning Contractors of America (ACCA) Quality Installation Specifications and Standards.
- The operational life must be supported by a planned maintenance or equipment replacement schedule.

## 4.3 Inspections

DE systems must be permitted with and inspected by the Authority Having Jurisdiction (“AHJ”) over construction projects in the Participant’s locale or the Participant must provide to APS a Letter in Lieu of Electrical Clearance<sup>7</sup> or other waiver acceptable to APS. Any inspections conducted by APS are in addition to, not in lieu of, these building and construction related inspections. Access to the system shall be made available to APS during normal business hours

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<sup>7</sup> Available on APS’s website.

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for the purpose of conducting the applicable APS inspection. Note that APS will at times be inspecting system components on the Participant side of the meter.

All grid-tied systems will be inspected by APS to ensure the system is connected to the grid in conformance with APS Interconnection Requirements.<sup>8</sup> Under no circumstances is any grid-tied system to be installed in parallel or otherwise connected with the APS system until such time that the system has been inspected by APS and written authorization is received from APS. APS will normally conduct the interconnection inspection only after the system has been inspected by the AHJ.

APS will select a subset of DE program reservations for an APS DE Program conformance inspection. The selected systems will be required to pass the conformance inspection before the Participant is eligible to receive an incentive payment. The purpose of the conformance inspection is to ensure that the system has been installed in accordance with the terms, conditions, and specifications provided on the Reservation Application and Credit Purchase Agreement and with the requirements outlined in this DEAP. The conformance inspections for photovoltaic systems will normally also include verification of the PV off-angle and shading factor reported for the PV installation in the reservation.

APS will randomly select some DE Program installations whose systems will receive a maintenance inspection to field verify that the system is being operated in compliance with the terms and conditions agreed to in the Reservation Request and Credit Purchase Agreement and the requirements outlined in this Plan. The purpose of the maintenance inspection is to gather information that will assist APS in its evaluation of the effectiveness of the DEAP.

#### **4.4 Metering and Meter Reading**

All DE systems must include a system dedicated kWh meter, or meters, which allows for measurement of system energy production (the "Performance Meter"). The Performance Meter must be installed in compliance with the APS Electric Service Requirements Manual (ESRM) Section 300, which is available on APS's website, and must be installed so as to record the renewable energy A/C power output produced by the inverter or generator. If Performance Meter output data is used to calculate a PBI, other metering arrangements may be required depending on the configuration of the system. These arrangements may include wireless or telephone line telemetry at the customer's expense. The Performance Meters are in addition to the APS billing meter and must be appropriately identified as the "Photovoltaic, Wind, etc., Performance Meter." The Performance Meter must be calibrated to meet industry standards and must provide either direct kWh readings or readings which can readily be converted to kWh (RECs) using standard engineering conversions. The Performance Meter is required to be located adjacent to the APS billing meter unless otherwise approved by APS.

In those circumstances where the DE system is a hybrid system (i.e., uses more than one technology), APS requires that a Performance Meter be in place to measure the RECs (kWh) produced from each renewable resource so that the information can be accurately recorded.

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<sup>8</sup> *Id.*

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APS may, at its discretion, install APS-owned Performance Meters for system monitoring purposes. A Performance Meter owned and read by APS may facilitate APS's ability to gather performance data and to report system performance to the Participant on their standard APS bill.

System generation (REC production) must be reported annually to APS for UFI Participants, unless other arrangements have been approved by APS. Participants utilizing PBIs will be provided with monthly system production on a quarterly basis. The reported production is to be verified by the participant or authorized representative and returned to APS along with the Renewable Energy Credit documentation. Payment for system production will be made on a quarterly basis following APS's receipt of the REC documentation and production verification.

### **4.5 REC Ownership**

As part of APS's payment of a UFI, the utility will be given complete and irrevocable ownership of all RECs expected from system production for 20 years, the expected or planned effective life of the DE system. APS's payment of a PBI will assure APS complete and irrevocable ownership of the REC for the full duration of the PBI agreement. Renewable Energy Credits provided to APS as a result of a DE system installation will be applied towards APS' RES targets.

### **4.6 System Maintenance**

To ensure a system benefit received by the REC purchase, APS requires that the Participant maintain and operate the DE system in APS territory for the specific duration detailed in the Reservation Request and Credit Purchase Agreement. If the DE system either needs to be removed from the Participant property or if it is no longer operational, the Participant must notify APS within five business days after the DE system is either removed from the property or is no longer operational. Short (those lasting less than one month) system "outages" as part of system repair or planned maintenance are anticipated as part of this program and need not be reported in accordance with the above requirement.

## **5. INSTALLER AND DEALER QUALIFICATIONS**

The installer must possess a valid license on file with the Arizona Registrar of Contractors ("AZROC"), with a license classification appropriate for the technology being installed, or the installer must identify use of a contractor holding an appropriate license on file with the AZROC for the technology being installed.

If the equipment dealer is party to the reservation request, the dealer must provide proof of possession of a business license that is in good standing with the appropriate agency(ies) and must also provide proof of liability insurance if the business license provided does not require liability insurance.

## **6. INCENTIVES**

### **6.1 Funding Allocation**

As described in APS's 2010 RES Implementation Plan, the annual funding level for DE incentives was established primarily based on previous year program installations and

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reservations with consideration for estimates of anticipated consumer demand for the various technologies, project sales and development time frames, variations in the levels of technology maturity, and availability of equipment for installation. The proposed DE incentive budget and the incentive budget allocation are designed to achieve the residential distributed energy target and provides for exceeding the non-residential distributed energy target for the full five years described in the current Implementation Plan.<sup>9</sup>

The incentive matrices in Exhibit 1 describe incentive reductions every two years of the program. Those planned reductions are designed to reflect the anticipation that DE technologies will decline in cost as market penetration and product availability increase. Eight specific DE budget allocations are described in the APS RES Implementation Plan: residential up-front incentives, existing production-based contracts, contracts resulting from the 2009 DE request for proposals, wholesale contracts, customer self-direct, new non-residential production-based incentives, and non-residential up-front incentives. Budget allocations for market-based projects are derived as a portion of the respective DE budget allocation which they support.

In the event that funds collected for use in the DE incentive program are not fully subscribed in a program year, those funds will be applied towards the next program year and allocated to achieve the required energy outcome between residential and non-residential projects.

Funds are made available for project reservations on the first working day after January 1<sup>st</sup> of each program year. Funds for residential projects will be made available for reservations on a first-come, first-reserved basis.

Funds offered under APS's expanded new non-residential program will be divided into three categories; Large Projects (PBI), Medium Projects (PBI), and Small Projects (UFI).

For purposes of APS expanded non-residential program, a Large Project is defined as any electricity producing project whose inverter(s) or generator(s) is rated greater than 100 kWac or any project whose lifetime incentive commitment is greater than \$2.5 million dollars. Incentives will be capped for electric producing systems at a capacity size of 2,000 kWac per interconnection point; actual system size is not limited under this program, although all other interconnection and program requirements remain applicable.

A Medium Project is defined as any electricity producing project whose inverter(s) or generator(s) is rated 100 kWac or less, or any project whose lifetime incentive commitment is less than \$2.5 million dollars, and does not qualify for an up-front incentive.

A Small Project is defined as any project that qualifies for an up-front incentive.

Large Project funding described in APS's Implementation Plan will be divided equally into two semi-annual nomination periods; March 1<sup>st</sup> (reservations received through the end of February) and September 1<sup>st</sup> (reservations received from March through the end of August). Medium Project funding as described in APS's Implementation Plan will be allocated equally over six nomination periods (January-February, March-April, May-June, July-August, September-

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<sup>9</sup> A.A.C. R14-2-1805(D).

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October, and November-December) with each equaling two full calendar months. Small Project funding will be allocated annually on a first come, first reserved basis.

Non-residential reservation requests are submitted as a bid expressed in \$/REC (or \$/kWh) and, if a PBI, the preferred REC and payment terms. Each bid is evaluated by a project ranking "calculator." A sample ranking calculator was prepared as part of the Commission Staff UCPP working group; APS's ranking calculator will be designed to function in substantially the same manner as the sample calculator. The input sheet and description for the sample calculator is attached provided as Exhibit 3. APS will make the ranking calculator publicly available on APS's website.

In the event that the budgeted funds available for that nomination period exceed the total amount of incentives requested, all qualifying reservations requested will be approved. Remaining budgeted funds for that nomination period will be equally divided among the remaining nomination periods within that category. If the reservation request is approved, APS will send a written confirmation to the applicant.

In the event that the demand for incentives exceeds the budgeted funds available for a nomination period in any one project category, APS will use the ranking calculator to select the projects with the highest ranking, which is the lowest Conforming Project Rank value, matching requested incentives with the available budgeted funds. If the reservation request is denied because funding is not available, APS will send written notification to the applicant. In the event that requests are denied due to funding, Conforming Project Rank values will be posted, along with their approval status. No specific project information (customer/contractor names, locations or non-energy/cost details) will be listed to ensure that confidentiality is maintained.

### **6.2 Incentive Principles**

As part of this Plan, residential systems are eligible only for UFIs. Non-residential systems may receive either a UFI or a PBI, depending on the technology and the installation size. UFIs were developed for technologies where the average project size results in a total incentive less than or equal to \$75,000. PBIs were developed for technologies where the average project size results in a total incentive totaling more than \$75,000, based on the net-present value of the total of incentive payments or the otherwise applicable UFI.

Incentive funds can be applied to a "project," which is the sum of all DE systems installed at a Participant site that are eligible for program incentives in a single calendar year. A Participant site can obtain a UFI for multiple projects, under separate reservations, up to \$75,000 at each Participant site per calendar year. Once the sum of incentives for all project(s) exceeds the \$75,000 limit, incentives for additional projects will take the form of a PBI.

#### **6.2.1 Reservations for New Residential Construction**

Incorporation of DE systems into the development of new residential construction requires the reservation of funds in a manner other than that described in the standard UFI process. Approved reservations for incentive funds for new construction will conform to the following provisions:

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- a. Funds may be reserved for up to three years for a single development or sub-division. A single reservation may request incentive funding for multiple systems.
- b. All funds within a reservation must be allocated to specific lots within the development or sub-division.
- c. The reservation must specifically indicate the development schedule for the identified lots and the year when the incentive payment is expected. Once a project is initiated, funding "adjustments" can not exceed 10 percent of the requested annual funding.
- d. Funds reserved but uncollected as completed projects in one year will be forfeited.
- e. Once funds have been reserved for a lot, no future reservation may be applied to that lot or the same technology until the original reservation has expired.

### **6.3 Standardized Incentives**

Incentives levels provided as part of this Plan were collaboratively developed, and, in part, were created to help or expand incipient markets for DE, taking into account each technology's specific market conditions, and placing a portion of the cost on the Participant. Incentive levels are provided in accordance with the applicable year project incentive matrix included as Exhibit 1.

### **6.4 Incentive Caps**

DE incentives can be applied to systems designed to serve only the typical load of the Participant. Typical load is defined as the total annual kWhs used by that customer at the metered point of interconnection. The assessment of that typical load does not preclude the periodic production of electricity in excess of the Participant's demand. Under some circumstances it is understood that select Participant installations will be designed to serve loads greater than that of the Participant. Under those circumstances, the incentive will be applied only to the fraction of the generation that is used to serve the typical Participant load. The DE incentives were developed separate and apart from other utility program incentives, such as those for demand side management projects. Systems are not eligible to receive DE incentives if incentives from other APS programs are received.

A PBI cannot exceed 60% of the "total project cost" for the DE system. Total project costs are defined as the undiscounted total system cost plus "acceptable financing" charges, if disclosed by the participant. Acceptable finance charges are finance charges used for the PBI incentive cap calculation and cannot exceed the current prime interest rate plus 5%. Financing charges may be disclosed as part of the commissioning package, if not disclosed before. The PBI incentive cap will decline in the third year of the program (2011) to 55% of the real project cost, and the cap will decline further to 50% of the real project cost in the fifth (2013) year of the program and beyond. Both residential and non-residential UFIs cannot exceed 50% of the system cost. Financing costs are not considered as part of the total system cost for these projects.

Dealer's and manufacturer's incentives are capped at 50% of the system cost basis. Dealers cannot include installation costs in the cost basis calculation. Dealers must provide verification for the cost paid for each system component. Manufacturers cannot include their own technology in the cost basis.

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For residential solar hot water heating systems, Participants are required to contribute a minimum of 15% of the "actual system cost." The actual system cost will be calculated by assuming the full application of all available federal and state incentives, regardless of the Participant's ability to realize any particular incentive; adding the Participant contribution (15%), and finally adding the program incentive. If the incentive can be fully applied without exceeding the actual system cost, the Participant will receive the full incentive amount. If the incentive cannot be fully applied without exceeding the actual system cost, the incentive will be capped so as not to exceed the system cost.

### **6.5 De-Rating of Photovoltaic System Incentives**

The productivity of photovoltaic systems is sensitive to the specifics of the installation method and location. In particular, these systems are impacted by shading and photovoltaic panel tilt angle and azimuth. This variability in system performance is taken into account when adjusting the available UFI level and determining the actual amount of incentive received by the Participant. Incentives for photovoltaic systems will be adjusted in accordance with the PV Off-Angle and Shading Adjustment Table attached as Exhibit 4.

### **6.6 Payment of PBIs**

Participants receiving PBI funds will be provided with monthly system production on a quarterly basis. The reported production is to be verified by the participant or authorized representative and returned to APS along with the Renewable Energy Credit documentation. Payment for system production will be made on a quarterly basis following APS's receipt of the REC documentation and production verification.

### **6.7 Taxes**

Program participants are solely responsible for the payment of any and all taxes applicable to the DE resource and/or the incentive payment(s).

### **6.8 Assignment of Payment**

Systems may be owned by third parties, and APS may make payments to such third parties upon the written consent of the Participant. Participants may assign payments to an installer, dealer, or developer. APS will consider assignment to other parties upon request by the Participant.

### **6.9 Default**

If the Participant fails to maintain and operate the DE system in APS territory for the period detailed in the Credit Purchase Agreement, which is never less than ten (10) years, the Participant shall be considered in default of the terms and conditions of the incentive payment agreement. Participants in default will be subject to damages and must reimburse the Program for all or a portion of the incentive(s) received to that point, subject to the terms of the Credit Purchase Agreement. The default terms in the Credit Purchase Agreement will vary slightly depending on whether the incentive is a UFI or PBI, but are designed to reimburse the Program for environmental credits that were paid and/or accounted for through the full incentive term, but

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not received. This is especially important for UFIs where APS is entitled to 20 years of credits through the payment of one up-front incentive.

### 7. RESERVATION PROCESS OVERVIEW

Participant submits a reservation request to APS: The Participant must submit a signed reservation request supplied by APS.

Participant receives reservation confirmation: After reviewing the reservation request, APS will assign a reservation status. If the reservation request is approved, APS will send a written confirmation to the applicant. Approved reservations will be logged in the order received.

If the reservation request is deficient in meeting one or more of the program requirements, APS will inform the Participant of the nature of the deficiency and will allow the Participant to correct the deficiency. If the reservation request is denied because funding is not available, the request will be placed on a waiting list and APS will send written notification to the applicant.

Credit Purchase Agreement: PBI participants must execute a Credit Purchase Agreement within 30 days of the date of the reservation confirmation from APS.

Proof of Advancement: The Participant may be required to submit Proof of Advancement (written progress report) to APS within 60 days of reservation approval for UFIs, and within 120 days of reservation approval for PBIs to retain an active reservation. The purpose of the Proof of Advancement requirement is to ensure that reservation dollars are allocated to projects that will advance to the installation stage. Reservations requiring Proof of Advancement will be notified at the time of reservation approval.

Interconnection Application: The interconnection application and site plan diagram is submitted to APS. APS will provide preliminary approval that the system meets interconnection standards (grid-tied). Final approval will not be issued until the interconnection inspection is completed.

Participant Proceeds with Installation: Obtain all required permits and proceed with system installation.

Grid-tied systems: Systems are required to pass an interconnection inspection that will be conducted by APS before the system can be authorized to operate in parallel to the APS grid. APS will conduct the interconnection inspection only after the system has been inspected by the AHJ or if APS has received a Letter in Lieu of Electrical Inspection. If the DE system passes the interconnection inspection, APS will provide the Participant with a written document that provides "Permission to Operate." If the DE system fails the interconnection inspection, the reservation can remain active, as long as the deficiency is remedied within the defined reservation timeframe.

Commissioning Packet: Participant must submit a signed Commissioning Packet supplied by APS. At a minimum, the Commissioning Packet will include certification from the installer/dealer and Participant that the system installed was consistent with the terms and conditions of the Reservation Packet and this Plan. If a material change was made between the time APS approved the reservation and the date APS received the Commissioning Packet, the

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Participant must complete an Amended Application. If the change increases the incentive amount the system is eligible to receive, APS will confirm that DE program funding is available. If funding is not available, APS will only provide an incentive in the amount requested in the Reservation Packet. Changes in the project plan that result in increased system output will only result in additional incentives beyond the original reservation amount if RES funding is sufficient/available.

If the system is a photovoltaic system that has been selected to receive a conformance inspection, the incentive may be adjusted in accordance with the provision set out in Section 6.5 of this Plan.

If the system has been selected to receive a conformance inspection, as detailed in Section 4.3, the incentive payment will not be processed until after the system has passed the conformance inspection.

APS sends incentive payment: For UFIs, APS will send the incentive payment or initiate incentive payments in accordance with the instructions provided by the Participant in the signed Commissioning Packet. For participants under a PBI, the payment process in Section 6.6 above will be followed.

### **8. EXTENSIONS AND CANCELLATION POLICY**

A Participant will receive a written notice of pending cancellation if all program requirements have not been met within the reservation timeframe. The reservation timeframe for UFIs is 180 days from the reservation confirmation date. For PBIs, the reservation timeframe is 365 days from the reservation confirmation. APS may grant an extension for up to 90 days following timely receipt of a Participant's request for extension and may approve written extension requests beyond 90 days under extenuating circumstances. APS may request additional support for the Proof of Advancement to be considered the extension.

### **9. ENERGY REPORTING PROGRAM MONITORING**

APS will track progress toward program goals on an ongoing basis to monitor program effectiveness and sufficiency of the funding allocation. APS will compile data received from conducting the conformance and maintenance inspections, meter readings, and analyze trends in Participant participation and technology installation. The data will be evaluated on an ongoing basis to better understand critical factors impacting the incentive structures and the overall effectiveness of this Plan. If the DEAP need to be adjusted to reflect new information, changing market conditions, incorrect initial assumptions, or technological innovations, APS will bring those issues to the attention of the Commission in a timely manner.

APS will report on the productivity of all distributed resource on an annual basis. For PBI systems, APS will report on the actual metered production of each system as reported by the Participant and confirmed by APS. For systems receiving a UFI, APS will report on the total installed capacity and projected productivity. APS will develop a method by which to calibrate the reported productivity and shall monitor that method for long-term accuracy.

On occasion, a DE system, which received a UFI, will be removed from the Participant property prior to the end of its agreement term without the permission of the utility. Also, on occasion, a

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DE system, which had received a UFI, will be in need of a repair which the Participant does not plan to complete. If either situation occurs, and if despite reasonable efforts on the part of the APS the Participant will not reinstall or repair the DE system, then APS will continue to reflect in its annual compliance reporting the annual historic energy production for the system until the agreement term for the system has been completed.

In addition, APS will monitor that specific Participant and Property to ensure that an additional incentive is not provided for any new DE system on that property until the operational life of the incented system has been completed. APS will attempt to monitor the number of missing and unrepaired DE systems and shall summarize its observations in its annual compliance report.

## **Exhibit 1**

### **Distributed Energy Incentives**

DISTRIBUTED ENERGY ADMINISTRATION PLAN CONFORMING PROJECT UP-FRONT INCENTIVES

UFI Matrix

Resource Type	Year Beginning				
	2010	2011	2012	2013	2014
<b>Residential(1)</b>					
SMALL WIND Residential (off-grid)	\$2.00/Watt	\$1.80/Watt	\$1.80/Watt	\$1.53/Watt	\$1.53/Watt
SMALL WIND Residential (grid-tied)	\$2.50/Watt	\$2.25/Watt	\$2.25/Watt	\$1.91/Watt	\$1.91/Watt
PV RESIDENTIAL (grid-tied) (2)	\$3.00/Watt	\$2.70/Watt	\$2.70/Watt	\$2.30/Watt	\$2.30/Watt
PV RESIDENTIAL (off-grid) (2)	\$2.00/Watt	\$1.80/Watt	\$1.80/Watt	\$1.53/Watt	\$1.53/Watt
SOLAR THERMAL (3,4)					
SOLAR SPACEWATER HEATING (4,5)	\$0.75/kWh	\$0.68/kWh	\$0.68/kWh	\$0.57/kWh	\$0.57/kWh
<b>Non-Residential (6)</b>					
BIOMASS/BIOGAS (electric)	0.00	0.00	0.00	0.00	0.00
BIOGAS/BIOMASS - CHP (electric) (7)	0.00	0.00	0.00	0.00	0.00
BIOGAS/BIOMASS - CHP (thermal) (7)	0.00	0.00	0.00	0.00	0.00
BIOMASS/BIOGAS (thermal)	0.00	0.00	0.00	0.00	0.00
BIOMASS/BIOGAS (cooling)	0.00	0.00	0.00	0.00	0.00
NON-RESIDENTIAL DAYLIGHTING (4)	\$0.20/kWh	\$0.18/kWh	\$0.18/kWh	\$0.15/kWh	\$0.15/kWh
Reserved	0.00	0.00	0.00	0.00	0.00
GEO THERMAL - (electric)	\$0.50/Watt	\$0.45/Watt	\$0.45/Watt	\$0.38/Watt	\$0.38/Watt
GEO THERMAL - (thermal) (4)	\$1.00/kWh	\$0.90/kWh	\$0.90/kWh	\$0.77/kWh	\$0.77/kWh
Reserved	0.00	0.00	0.00	0.00	0.00
PV NON-RESIDENTIAL - small (2)	\$2.50/Watt	\$2.25/Watt	\$2.25/Watt	\$1.91/Watt	\$1.91/Watt
PV NON-RESIDENTIAL (grid-tied) (2)	\$2.50/Watt	\$2.25/Watt	\$2.25/Watt	\$1.91/Watt	\$1.91/Watt
PV NON-RESIDENTIAL (off-grid) (2)	\$1.50/Watt	\$1.35/Watt	\$1.35/Watt	\$1.15/Watt	\$1.15/Watt
SMALL WIND Non-Residential (grid-tied) (8)	\$2.50/Watt	\$2.25/Watt	\$2.25/Watt	\$1.91/Watt	\$1.91/Watt
SMALL WIND Non-Residential (off-grid) (8)	\$2.00/Watt	\$1.80/Watt	\$1.80/Watt	\$1.53/Watt	\$1.53/Watt
SOLAR SPACE COOLING (4,9)	\$1.00/kWh	\$0.90/kWh	\$0.90/kWh	\$0.77/kWh	\$0.77/kWh
SOLAR WATER HEATING/SPACE HEATING (4,9)	\$0.45/kWh	\$0.41/kWh	\$0.41/kWh	\$0.34/kWh	\$0.34/kWh
NON-RESIDENTIAL POOL HEATING (4)	\$0.10/kWh	\$0.09/kWh	\$0.09/kWh	\$0.08/kWh	\$0.08/kWh

DISTRIBUTED ENERGY ADMINISTRATION PLAN CONFORMING PROJECT PRODUCTION BASE INCENTIVES

PBI Matrix 1	Contract Years 10		PBI Years 10		2014	
	1	2	3	4		5
Residential or Non-Residential	Resource Type	Year Beginning				
		2010	2011	2012	2013	2014
<b>Residential(1)</b>						
SMALL WIND Residential (off-grid)	Wind	-	-	-	-	-
SMALL WIND Residential (grid-tied)	Wind	-	-	-	-	-
PV RESIDENTIAL (grid-tied) (2)	Solar PV	-	-	-	-	-
PV RESIDENTIAL (off-grid) (2)	Solar PV	-	-	-	-	-
SOLAR THERMAL (3,4)		-	-	-	-	-
SOLAR SPACE/WATER HEATING (4,5)	Solar - All Other	-	-	-	-	-
<b>Non-Residential (6)</b>						
BIOMASS/BIOGAS (electric)	Biomass/Biogas	0.060	0.054	0.054	0.046	0.046
BIOGAS/BIOMASS - CHP (electric) (7)	Biomass/Biogas	0.035	0.032	0.032	0.027	0.027
BIOGAS/BIOMASS - CHP (thermal) (7)	Biomass/Biogas	0.018	0.016	0.016	0.014	0.014
BIOMASS/BIOGAS (thermal)	Biomass/Biogas	0.015	0.014	0.014	0.011	0.011
BIOMASS/BIOGAS (cooling)	Biomass/Biogas	0.032	0.029	0.029	0.025	0.025
NON-RESIDENTIAL DAYLIGHTING	Other	-	-	-	-	-
Reserved	Other	-	-	-	-	-
GEO THERMAL - (electric)	Geothermal	0.024	0.022	0.022	0.019	0.019
GEO THERMAL - (thermal)	Geothermal	0.129	0.116	0.116	0.099	0.099
Reserved	Other	-	-	-	-	-
PV NON-RESIDENTIAL - small (2)	Solar PV	0.202	0.182	0.182	0.154	0.154
PV NON-RESIDENTIAL (grid-tied) (2)	Solar PV	0.121	0.109	0.109	0.093	0.093
PV NON-RESIDENTIAL (off-grid) (2)	Solar PV					
SMALL WIND Non-Residential (grid-tied) (8)	Wind	0.145	0.131	0.131	0.111	0.111
SMALL WIND Non-Residential (off-grid) (8)	Wind	0.116	0.105	0.105	0.089	0.089
SOLAR SPACE COOLING (9)	Solar - All Other	0.129	0.116	0.116	0.099	0.099
SOLAR WATER HEATING/SPACE HEATING (9)	Solar - All Other	0.057	0.051	0.051	0.043	0.043
NON-RESIDENTIAL POOL HEATING	Solar - All Other	0.012	0.011	0.011	0.009	0.009

DISTRIBUTED ENERGY ADMINISTRATION PLAN CONFORMING PROJECT PRODUCTION BASE INCENTIVES

PBI Matrix 2	Contract Years 15 PBI Years 15					
	2010	2011	2012	2013	2014	
Residential or Non-Residential	Resource Type	Year Beginning	Year Beginning	Year Beginning	Year Beginning	
Residential(1)						
SMALL WIND Residential (off-grid)	Wind	-	-	-	-	
SMALL WIND Residential (grid-tied)	Wind	-	-	-	-	
PV RESIDENTIAL (grid-tied) (2)	Solar PV	-	-	-	-	
PV RESIDENTIAL (off-grid) (2)	Solar PV	-	-	-	-	
SOLAR THERMAL (3,4)		-	-	-	-	
SOLAR SPACE/WATER HEATING (4,5)	Solar - All Other	-	-	-	-	
<b>Non-Residential (6)</b>						
BIOMASS/BIOGAS (electric)	Biomass/Biogas	0.056	0.050	0.050	0.043	
BIOGAS/BIO MASS - CHP (electric) (7)	Biomass/Biogas	0.032	0.029	0.029	0.025	
BIOGAS/BIO MASS - CHP (thermal) (7)	Biomass/Biogas	0.017	0.015	0.015	0.013	
BIOMASS/BIOGAS (thermal)	Biomass/Biogas	0.014	0.013	0.013	0.011	
BIOMASS/BIOGAS (cooling)	Biomass/Biogas	0.030	0.027	0.027	0.023	
NON-RESIDENTIAL DAYLIGHTING	Other	-	-	-	-	
Reserved	Other	-	-	-	-	
GEO THERMAL - (electric)	Geothermal	0.022	0.020	0.020	0.017	
GEO THERMAL - (thermal)	Geothermal	0.120	0.108	0.108	0.092	
Reserved	Other	-	-	-	-	
PV NON-RESIDENTIAL - small (2)	Solar PV	0.187	0.168	0.168	0.143	
PV NON-RESIDENTIAL (grid-tied) (2)	Solar PV	0.112	0.101	0.101	0.086	
PV NON-RESIDENTIAL (off-grid) (2)	Solar PV					
SMALL WIND Non-Residential (grid-tied) (8)	Wind	0.135	0.121	0.121	0.103	
SMALL WIND Non-Residential (off-grid) (8)	Wind	0.108	0.097	0.097	0.082	
SOLAR SPACE COOLING (9)	Solar - All Other	0.120	0.108	0.108	0.092	
SOLAR WATER HEATING/SPACE HEATING (9)	Solar - All Other	0.052	0.047	0.047	0.040	
NON-RESIDENTIAL POOL HEATING	Solar - All Other	0.011	0.010	0.010	0.009	

PBI Matrix 3	Contract Years 10		PBI Years 20		Forecast Year	
	PBI Convention		Year Beginning		Year	
	Year 1	Year 11	2	3	4	5
Residential or Non-Residential	Resource Type	2010	2011	2012	2013	2014
<b>Residential(1)</b>						
SMALL WIND Residential (off-grid)	Wind	-	-	-	-	-
SMALL WIND Residential (grid-tied)	Wind	-	-	-	-	-
PV RESIDENTIAL (grid-tied) (2)	Solar PV	-	-	-	-	-
PV RESIDENTIAL (off-grid) (2)	Solar PV	-	-	-	-	-
SOLAR THERMAL (3,4)		-	-	-	-	-
SOLAR SPACE/WATER HEATING (4,5)	Solar - All Other	-	-	-	-	-
<b>Non-Residential (6)</b>						
BIOMASS/BIOGAS (electric)	Biomass/Biogas	-	-	-	-	-
BIOGAS/BIOMASS + CHP (electric) (7)	Biomass/Biogas	-	-	-	-	-
BIOGAS/BIOMASS - CHP (thermal) (7)	Biomass/Biogas	-	-	-	-	-
BIOMASS/BIOGAS (thermal)	Biomass/Biogas	-	-	-	-	-
BIOMASS/BIOGAS (cooling)	Biomass/Biogas	0.040	0.036	0.036	0.031	0.031
NON-RESIDENTIAL DAYLIGHTING	Other	-	-	-	-	-
Reserved	Other	-	-	-	-	-
GEO THERMAL - (electric)	Geothermal	0.030	0.027	0.027	0.023	0.023
GEO THERMAL - (thermal)	Geothermal	0.160	0.144	0.144	0.122	0.122
Reserved	Other	-	-	-	-	-
PV NON-RESIDENTIAL - small (2)	Solar PV	0.250	0.225	0.225	0.191	0.191
PV NON-RESIDENTIAL (grid-tied) (2)	Solar PV	0.150	0.135	0.135	0.115	0.115
SMALL WIND Non-Residential (grid-tied) (8)	Wind	0.180	0.162	0.162	0.138	0.138
SMALL WIND Non-Residential (off-grid) (8)	Wind	0.144	0.130	0.130	0.110	0.110
SOLAR SPACE COOLING (9)	Solar - All Other	0.160	0.144	0.144	0.122	0.122
SOLAR WATER HEATING/SPACE HEATING (9)	Solar - All Other	0.070	0.063	0.063	0.054	0.054
NON-RESIDENTIAL POOL HEATING	Solar - All Other	0.015	0.014	0.014	0.011	0.011

DISTRIBUTED ENERGY ADMINISTRATION PLAN CONFORMING PROJECT PRODUCTION BASE INCENTIVES

**PBI Matrix 4**

**Contract Years 20 PBI Years 20**

Forecast Year 2	Forecast Year 3	Forecast Year 4	Forecast Year 5	Forecast Year 6	PBI Convention			
					Year 1 100%	Year 11 0%	Year Beginning	Year Beginning
Residential or Non-Residential	Resource Type	2010	2011	2012	2013	2014		
<b>Residential(1)</b>								
SMALL WIND Residential (off-grid)	Wind	-	-	-	-	-		
SMALL WIND Residential (grid-tied)	Wind	-	-	-	-	-		
PV RESIDENTIAL (grid-tied) (2)	Solar PV	-	-	-	-	-		
PV RESIDENTIAL (off-grid) (2)	Solar PV	-	-	-	-	-		
SOLAR THERMAL (3,4)	Solar - All Other	-	-	-	-	-		
SOLAR SPACEWATER HEATING (4,5)	Solar - All Other	-	-	-	-	-		
<b>Non-Residential (6)</b>								
BIO MASS/BIO GAS (electric)	Biomass/Biogas	0.054	0.048	0.048	0.041	0.041		
BIO GAS/BIO MASS - CHP (electric) (7)	Biomass/Biogas	0.031	0.028	0.028	0.024	0.024		
BIO GAS/BIO MASS - CHP (thermal) (7)	Biomass/Biogas	0.016	0.014	0.014	0.012	0.012		
BIO MASS/BIO GAS (thermal)	Biomass/Biogas	0.013	0.012	0.012	0.010	0.010		
BIO MASS/BIO GAS (cooling)	Biomass/Biogas	0.029	0.026	0.026	0.022	0.022		
NON-RESIDENTIAL DAYLIGHTING	Other	-	-	-	-	-		
Reserved	Other	-	-	-	-	-		
GEO THERMAL - (electric)	Geothermal	0.022	0.019	0.019	0.017	0.017		
GEO THERMAL - (thermal)	Geothermal	0.115	0.104	0.104	0.088	0.088		
Reserved	Other	-	-	-	-	-		
PV NON-RESIDENTIAL - small (2)	Solar PV	0.180	0.162	0.162	0.138	0.138		
PV NON-RESIDENTIAL (grid-tied) (2)	Solar PV	0.108	0.065	0.065	0.083	0.083		
PV NON-RESIDENTIAL (off-grid) (2)	Solar PV	0.130	0.117	0.117	0.099	0.099		
SMALL WIND Non-Residential (grid-tied) (8)	Wind	0.104	0.094	0.094	0.080	0.080		
SMALL WIND Non-Residential (off-grid) (8)	Wind	0.115	0.104	0.104	0.088	0.088		
SOLAR SPACE COOLING (9)	Solar - All Other	0.051	0.045	0.045	0.039	0.039		
SOLAR WATER HEATING/SPACE HEATING (9)	Solar - All Other	0.011	0.010	0.010	0.008	0.008		
NON-RESIDENTIAL POOL HEATING	Solar - All Other	0.011	0.010	0.010	0.008	0.008		

*DISTRIBUTED ENERGY ADMINISTRATION PLAN – INCENTIVE MATRIX NOTES*

- 1) Residential projects are only eligible for up-front incentives (UFI). UFI payments, whether residential or non-residential, can not exceed 50% of the system cost.
- 2) Some installations will require an adjustment of the incentive as detailed in the PV Incentive Adjustment Chart.
- 3) Residential Solar Thermal is a single system design that produces both space heating and water heating for residential use. These applications require a report detailing energy savings for the complete system.
- 4) Rate applies to rated first year energy savings only.
- 5) Energy savings rating is based on the SRCC OG-300 published rating. The customer contribution must be a minimum of 15% of the project cost after accounting for and applying all available Federal and State incentives.
- 6) Non-residential projects with a total incentive of less than or equal to \$75,000 are only eligible for a UFI. Non-residential projects with a total incentive of greater than \$75,000 are only eligible for a production-based incentive. The total payments
- 7) The CHP incentives may be used in combination for the appropriate components of one system.
- 8) The small wind PBI applies to a maximum system size of 100 kW. A larger wind system may apply for an incentive as a non-conforming project.
- 9) The solar space heating and cooling incentives may be used in combination for the appropriate components of one system.

## **Exhibit 2**

### **Solar Space Heating Incentive Calculator**

# Solar Space Heating Incentive Calculation Procedure.

In Advance, please perform the Design Review and Utility Bill Review (if Applicable) for numbers to enter in Steps #1, #2 and #5.

**Elevation Zone Table:**

Min Elevation	Max Elevation	Heating Season Days	Daily Panel Heat Output
-1000	1000	105	0
1001	3000	140	0
3001	5000	175	0
5001	7000	210	0
7001	9000	245	0
9001	11000	280	0

**Collector Thermal Performance Rating**  
Data From OG-100 Sheet

Category:	Delta T	Clear Day
A	-9 Deg. F.	
B	+9 Deg. F.	
C	+36 Deg. F.	
D	+90 Deg. F.	
E	+144 Deg. F.	

Enter Solar Panel Make and Model Number Selected for Project:

**Step #1:** Enter the result of the Design Review of the Design Annual Building Loss =  BTU/Year

**Step #2:** Enter the result of the Utility Bill Review of the Actual Annual Building Loss: (If not Electric, Natural Gas or Propane Heat, enter 0) =  BTU/Year

**Step #3:** Calculate the Lesser of the Result in Step #1 & Step #2 = This is the Annual Building Heat Requirement.  BTU/Year

**Step #4:** Enter Elevation of the Solar Space Heated Building:  Feet AMSL

**Step #4 cont:** Number of Heating Days per Heating Season from Elevation Zone Table:  Days per Year

**Step #4 cont:** Calculate Average Daily Building Heat Requirement =  BTU/Day

**Step #5:** Enter Passive Heat Storage Specific Heat Capacity from Building Design Review:  BTU/Deg. F.

**Step #5 cont:** Enter Maximum Daily Room Temperature Variation Allowed by Building Occupants: (Max of 10 Degrees F.)  Degrees F.

**Step #5 cont:** Calculate Maximum Passive Heat Storage Capacity =  BTU

**Step #5 cont:** Enter Total Active Heat Storage Heat Capacity from Building Design Review:  BTU

**Step #5 cont:** Calculate Maximum Total Heat Storage Capacity =  BTU

**Step #6:** Calculate the Lesser of the Average Daily Building Heat Requirement in Step #4 and the Maximum Total Storage Capacity in Step #5. This is the Maximum Useful Daily Solar Heat Input.  BTU/Day

**Step #7:** Size the Solar Panels based on a total daily solar heat input no greater than the Maximum Useful Daily Solar Heat Input. Enter the single panel SRCC OG-100 Collector Thermal Performance Rating data in the Table Above.  BTU/Day per Panel

**Step #7cont:** Enter the Total number of solar panels to be installed:  # of Panels

**Step #7cont:** Calculate the Average Expected Daily Solar Heat Input:  BTU/Day

**Step #8:** Calculate the Expected Annual Useful Solar KWH Heat Input using the Number of Heating Days times the Average Expected Daily Solar Heat Input / 3415 BTU/KWH:  KWH/Year

**Step #9:** Enter the UFI per first year KWH UCPP Incentive Rate:  \$/KWH

**Step #9 cont:** Calculate the Total Maximum UFI Payment Subject to Possible Limitation by the 50% of Initial Cost Cap & 15% Minimum Customer Contribution:  \$

**Step #10:** Enter the Total Solar Space Heating System Initial Cost: This should not include costs for Passive Heat Storage or Building Heating System.  \$

**Step #10 cont:** Calculate the Total Expected Federal and Arizona Incentives for this Project:  \$

**Step #10 cont:** Calculate the 15% minimum of the Total Solar Space Heating System Initial Cost to be paid by Customer:  \$

**Step #10 cont:** Calculate the Total Actual UFI Payment:  \$

## **Exhibit 3**

### **Standard Project PBI Ranking Calculator**

# APS PBI Project Ranking Calculator

## PBI INDEX CALCULATOR

Input Terms	
P1 Incentive Terms	10-year PBI, 10 year REC
P2 Project Cost (\$)	100
P3 Estimated Annual Production (kWh)	1
P4 Requested PBI (\$/kWh)	0.0100
Output Terms	
P5 Index Value	111
P6 Calculated Incentive Cap	60
P7 Total Incentive Payout	0

Pull-down box for input of PBI term

Input Project Cost

Input Estimated Annual Energy Production in kWh

Input requested PBI rate

Index Value

## UFI INDEX CALCULATOR

Input Terms	
U1 Technology Incentive Type	Up Front Incentive
U2 Capital Cost (\$)	100
U3 Capacity (kW)	1
U4 Estimated Annual Production (kWh)	1
U5 Requested Incentive (\$/Watt or \$/kWh)	0.0100
Output Terms	
U4 Index Value	7,358
U5 Total Incentive Payout	10

Pull-down Box for UFI type

Input Capital Cost of Project - (\$s)

For incentives based on capacity: Input Rated Size of System in kW, this input is not used for First Year Energy Savings.

Input Annual Energy Production in kWh for System Capacity UFIs, otherwise, for First Year Energy Savings kWh savings.

Index Value

Input requested incentive. For System Capacity UFIs, input \$/Watt, otherwise, for First Year Energy Savings input \$/kWh.

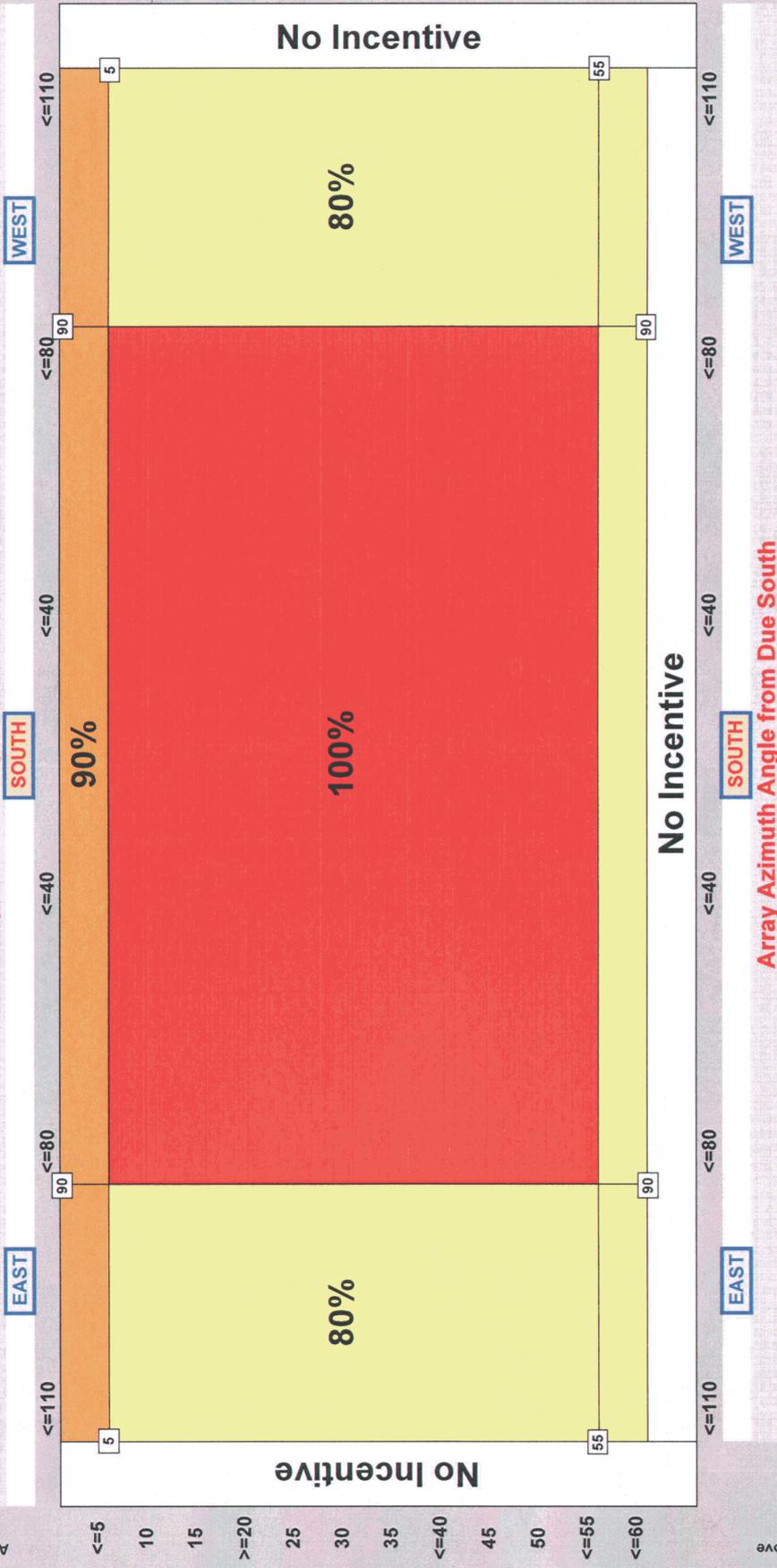
## **Exhibit 4**

### **PV Off-Angle and Shading Adjustment Table**

# APS - PV Off-Angle & Shading Incentive Adjustment Chart

Revised 07/01/2008

Array Azimuth Angle from Due South



Shade Factor <sup>1</sup>	0.74 - 0.60	0.59 - 0.00
Percentage of Incentive	65%	0%

The system installation will receive the lowest applicable incentive adjustment, reading from both the installation Angle Chart and Shading Adjustment

Notes: <sup>1</sup> "Shade Factor" is the percentage of annual solar insolation expected given latitude, shading and the available solar window.

**Attachment C**

**Renewable Energy Standard Rate Schedule**



**ADJUSTMENT SCHEDULE RES  
RENEWABLE ENERGY STANDARD**

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APPLICATION

The Renewable Energy Standard ("RES") Adjustor shall apply to all retail Standard Offer or Direct Access service, excluding kWhs served in accordance with rate schedules SP-1 (Solar Partners), Solar-2, Solar-3, and Adjustment Schedules GPS-1 and GPS-2. All provisions of the customer's current applicable rate schedule will apply in addition to the RES Adjustor. From time to time, the RES program spending requirements will be evaluated and if necessary the charge and/or caps may be modified by the Commission. Any new charges/caps will be applied in billing cycle 1 beginning in the month following Commission approval in A.C.C. Decision No. XXXXX and will not be prorated. Details regarding the administration of this Adjustor can be found in A.A.C. R14-2-1808. The RES Adjustor and the Demand Side Management Adjustor may be combined on the customer's bill and shown on the "Environmental Benefits Surcharge" line.

RATES

The bill shall be calculated at the following rates:

All kWh	\$0.008532	per kWh
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SURCHARGE LIMITS

The monthly total of the Renewable Energy Standard Adjustment Charge shall not exceed the following limits:

Residential Customers	\$3.41	per service per month
Non-residential Customers	\$126.75	per service per month
Non-residential Customers with demand of 3,000 kW or higher per month for three consecutive months	\$380.26	per service per month