

LLC. The facility began commercial operation in July 2009. Total output for 2010 was 264,354 MWh.

#### Geothermal Resources

##### Sexton Sea/CE Turbo

CE Turbo is a 10 MW geothermal facility located in Imperial County, CA owned and operated by Cal Energy. The facility began delivering power to APS in January of 2006. Total output for 2010 was 14,851 MWh.

#### Biomass Resources

##### Snowflake White Mountain Power

The Snowflake White Mountain Power facility is a 25 MW<sup>13</sup> biomass facility located near Snowflake, AZ. APS signed its original agreement in September 2005 for 15 MW of output from the facility. In August 2010, the Company executed a one-year contract to purchase the remaining available 10 MWs of facility output. In 2010, the facility provided 132,973 MWh<sup>14</sup> of renewable energy to APS.

#### Biogas/Landfill Gas Resources

##### Sexton Glendale Landfill

The Sexton facility is a 2.8 MW biogas (landfill gas) facility located at the City of Glendale landfill in Glendale, AZ. The facility is owned and operated by Sexton Energy, LLC. Construction of the facility was completed in late December 2009. The facility began commercial operation in January 2010 and produced 17,880 MWh in calendar year 2010.

#### **b) Generation Under Power Purchase Agreement ("PPA") – Not Yet in Operation**

APS holds several long-term PPAs whose output will be eligible for inclusion under the RES once these facilities are in operation:

#### **Solar Resources**

##### Solana Generating Station

The Solana Generating Station will be located near Gila Bend, AZ. The facility will generate 250 MW using solar trough technology with thermal energy storage, and will be owned and operated by Arizona Solar One, LLC. The project began construction in November 2010 and reached financial close on December 20, 2010. APS expects the facility to be completed in 2013, with an anticipated yearly output of 903,000 MWh when fully operational.

**The Solana Generating Station made national headlines and achieved financial close in 2010, a key project milestone.**

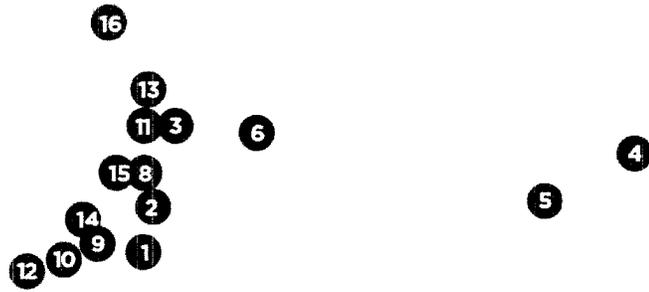
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<sup>13</sup> See footnote 1 in Table 1.

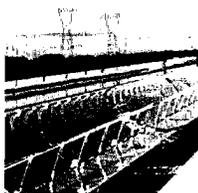
<sup>14</sup> 119,118 MWh generated from the Snowflake White Mountain Power facility was counted as a Renewable Generation resource and 13,855 MWh was counted as a wholesale DE resource.

## Diversified Renewable Portfolio

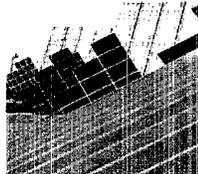
APS selects renewable energy projects based on what is the best fit for its load and the best price for customers.



### Existing Projects



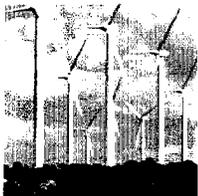
1 SAGUARO  
Concentrating Solar  
(1 MW)



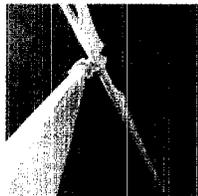
2 STAR CENTER  
(AND OTHER  
SMALL SOLAR  
ACROSS AZ)  
Photovoltaic Solar  
(1 MW)



3 PRESCOTT  
Photovoltaic Solar  
(3 MW)



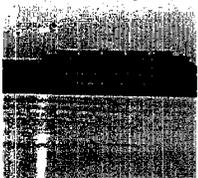
4 ARAGONNE  
MESA  
Wind  
(90 MW)



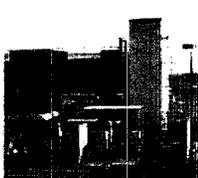
5 HIGH  
LONESOME  
Wind  
(100 MW)



6 SNOWFLAKE  
Biomass  
(20 MW)

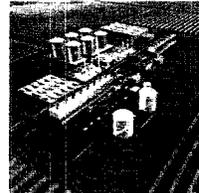


7 SALTON SEA  
Geothermal  
(10 MW)



8 GLENDALE  
LANDFILL  
Biogas  
(3 MW)

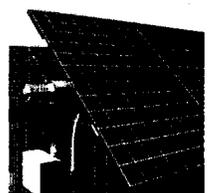
### Future Projects



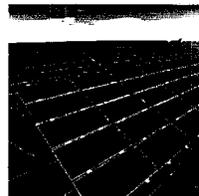
9 SOLANA  
Concentrating Solar  
(250 MW)



10 AJO  
Photovoltaic Solar  
(5 MW)



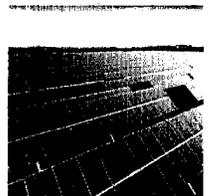
11 PRESCOTT  
Photovoltaic Solar  
(10 MW)



12 HYDER  
Photovoltaic Solar  
(16 MW)



13 CHINO VALLEY  
Photovoltaic Solar  
(19 MW)



14 COTTON  
CENTER  
Photovoltaic Solar  
(17 MW)



15 LUKE AFB  
Photovoltaic Solar  
(14 MW)



16 PERRIN RANCH  
Wind  
(99 MW)

**APS contracted for 131 MW of new renewable resources through power purchase agreements, in addition to the 250 MW previously contracted.**

*Ajo Generating Station*

The Ajo Generating Station will be located near Ajo, AZ and will generate 4.5 MW using crystalline photovoltaic single axis tracking technology. The facility will be owned by RE Ajo 1 LLC. Project construction began on January 3, 2011 with an estimated in service date of November 2011. Anticipated yearly output is 10,000 MWh.

*Prescott Generating Station*

The Prescott Solar Plant will be located in Prescott, Arizona, two miles north of Prescott Regional Airport (Ernest A. Love Field). The facility will be owned and operated by SunE AZ1 LLC, and will generate 10 MW using crystalline photovoltaic single axis tracking technology. Construction began on December 14, 2010, and APS expects the facility to be in-service in October of 2011. APS will receive all of the plant's anticipated yearly output of 25,000 MWh.

**Wind Resources**

*Perrin Ranch Wind Farm*

The Perrin Ranch Wind Farm will be located near Williams, Arizona. The facility is owned and operated by PR Wind LLC, a special purpose entity of NextEra Energy Resources, LLC, and will provide 99 MW of wind generation. APS expects the facility to be completed by the end of 2011, with an anticipated yearly output of 282,000 MWh.

**c) Generation Under PPA Contract – Pending Commission Consideration**

In the Company's 2009 RES Implementation Plan, APS received approval to implement a one year Small Generation Pilot Program for projects producing less than 35,000 MWh per year.<sup>15</sup> In the second quarter of 2010, APS issued another Small Generation competitive solicitation which served as the first of the three annual solicitations that comprise APS's Small Generator Standard Offer Program, ranging in size from 2 MW to 15 MW. APS received 91 proposals from 42 respondents and, after completing both a full evaluation of the proposals and related contract negotiations, executed Small Generation Renewable Energy Purchase and Sale Agreements with two small generation developers. At the time of this filing, APS has a filing pending with the Commission related to this program. APS has announced that it will issue the second Small Generator Standard Offer RFP in April 2011.

**Solar Resources**

*Solar Generation Facility, located in Tonopah, AZ<sup>16</sup>*

This project will be a 15 MW solar generation facility located in Tonopah, AZ. The facility will be owned and operated by an independent developer. The in-service date is expected to be December 2012 and the anticipated first-year output is 35,061 MWh.

<sup>15</sup> Decision No. 70654 (December 18, 2008).

<sup>16</sup> Due to a confidentiality provision in the agreements with the selected counterparties, APS cannot release the names of the facilities as part of this filing.

## **Landfill Gas Resources**

### Landfill Gas Generation Facility, located in Surprise, AZ<sup>17</sup>

This project will be a 3.2 MW landfill gas generation facility located in Surprise, AZ. The facility is owned and operated by an independent developer. The commercial operation date is expected to be June 2012 and the anticipated yearly output is 22,500 MWh.

APS's 2010 investment in Arizona solar resources includes contracts for 66 MW through its AZ Sun Program.

### **d) Generation Under Development through the AZ Sun program**

#### **Solar Resources**

##### Cotton Center Solar Plant

The Cotton Center Solar Plant will be located in Gila Bend, AZ. The facility will generate 17 MW using polycrystalline photovoltaic modules on single-axis tracking systems. SOLON Corporation will engineer, procure and construct the project and APS will own

and operate the facility. The plant is expected to be in-service by November 2011 with an anticipated annual energy production of approximately 46,000 MWh.

##### Hyder Solar Plant

The Hyder Solar Plant will be located in Hyder, AZ. The facility will generate 16 MW using polycrystalline photovoltaic modules mounted on single-axis tracking systems. SunEdison will engineer, procure and construct the project and APS will own and operate the facility. The first 11 MW are expected to be in-service by November 2011 and the remaining 5 MW by April 2012. Upon completion, the entire facility is expected to produce about 41,000 MWh annually.

##### Chino Valley Solar Plant

The Chino Valley Solar Plant will be located near Chino Valley, AZ. The facility will generate 19 MW using polycrystalline photovoltaic modules mounted on single-axis tracking systems. SunEdison will engineer, procure and construct the project and APS will own and operate the facility. The plant is expected to be in-service by October 2012 and anticipated annual energy production is approximately 46,000 MWh.

##### Luke Air Force Base Solar Plant

The Luke Air Force Base ("AFB") Solar Plant will be located at Luke AFB in Glendale, AZ. The facility will generate 14 MW using high efficiency monocrystalline photovoltaic modules mounted on single-axis tracking systems. SunPower Corporation will engineer, procure and construct the project and APS will own and operate the facility. The anticipated annual energy production is about 35,000 MWh. The project in-service date is currently under evaluation but is expected to be in the 2012-2013 timeframe.

## **2. Contracts Terminated**

APS did not terminate any Renewable Generation contracts in 2010.

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<sup>17</sup> See footnote 16.

### 3. Renewable Generation Costs

In 2010, APS's Renewable Generation energy was derived from purchased power contracts and APS-owned solar facilities. Table 4 below summarizes the invoice costs associated with those purchased power renewable energy contracts.<sup>18</sup>

**Table 4:**  
**2010 Renewable Generation Costs per MWh (renewable energy premium costs)<sup>1</sup>**

	<b>MW (capacity)</b>	<b>MWh (energy)</b>	<b>RES Cost</b>	<b>RES Cost per MWh</b>
Wind	190.0	529,674	2	2
Biomass	25.0	119,118	2	2
Landfill Gas	2.8	17,880	2	2
Geothermal	10.0	14,851	2	2
Solar (APS-owned) <sup>3</sup>	5.6	13,598		
<b>Renewable Generation Total</b>	<b>233.4</b>	<b>695,121</b>	<b>\$ 8,200,983</b>	<b>\$ 11.80</b>

*Notes to Table 4:*

<sup>1</sup> Renewable energy premium cost is recovered through the RES; remaining cost is recovered through the Power Supply Adjustor.

<sup>2</sup> Redacted due to the competitively confidential nature of the contract information.

<sup>3</sup> Includes RES multiplier for in-state solar installations prior to December 31, 2005.

## B. Distributed Energy Efforts

### 1. Distributed Energy Installations, Capacity and Energy

In 2010, APS customers installed a record 5,089 DE systems, of which 5,030 received UFIs and 59 received Production-Based Incentives ("PBI"). UFI installations included 2,943 photovoltaic systems (2,860 residential and 83 non-residential), 2,026 solar hot water heaters (2,021 residential installations), 8 wind turbines (7 residential installations), 11 geothermal space heating (all of which were residential), 24 other solar thermal technologies (e.g. solar pool heating), 17 Geothermal Space Heating (all 17 residential) and one Geothermal Electricity Generator (residential). 54 of the 59 PBI installations were photovoltaic technologies, one was solar heating, one was solar cooling, one was biogas electric, one was biogas thermal and one was solar water heating.

**APS achieved 102 percent of its residential DE requirement and 95 percent of its total DE requirement, a 266 percent increase over the Company's 2009 DE production.**

The DE program showed strong growth from previous years and by the end of 2010, APS customers and programs installed and reserved 383,845 MWh of generation, about two and a half times the 2010 DE compliance target. Due to the development timeline for DE installations, APS has a large number of projects in the reserved stage by the end of each calendar year. Based on the timelines defined in APS's Distributed Energy Administration Plan ("DEAP"), the Company expects

<sup>18</sup> Invoice costs do not include associated system integration costs for these resources.

most of these reservations to be installed prior to the end of the third quarter 2011, many of them much sooner.

Table 5 highlights the capacity and energy associated with the above referenced installations.

**Table 5:  
2010 Distributed Energy Installed Resources**

	MW (capacity)	MWh <sup>2</sup> (energy)	DE Target	Percentage of DE Target
<b><u>Residential</u></b>				
<b><u>UFI</u></b>				
Solar Electric <sup>1</sup>	31.6	56,140		
Wind	0.1	122		
Biogas	-	-		
Solar Space Heating	N/A	34		
Solar Water Heating	N/A	12,891		
Solar HVAC	N/A	9		
Geothermal Space Heating	N/A	1,773		
<b>Total Residential</b>	<b>31.7</b>	<b>70,969</b>	<b>69,274</b>	<b>102%</b>
<b><u>Non-Residential</u></b>				
<b><u>UFI</u></b>				
Solar Electric <sup>1</sup>	6.9	4,063		
Wind	0.02	43		
Biogas	-	-		
Solar Space Heating	N/A	1,254		
Solar Water Heating	N/A	1,727		
Solar HVAC	N/A	573		
Solar Pool Heating	N/A	897		
<b><u>PBI</u></b>				
Solar Electric <sup>1</sup>	19.8	34,994		
Wind	-	-		
Biogas	0.3	1,574		
Solar Space Heating	N/A	-		
Solar Water Heating	N/A	1,464		
Solar HVAC	N/A	-		
<b><u>Wholesale DE</u></b>				
Biomass	N/A	13,855		
<b>Total Non-Residential</b>	<b>27.0</b>	<b>60,444</b>	<b>69,273</b>	<b>87%</b>
<b>Total Distributed Energy Resources</b>	<b>58.7</b>	<b>131,413</b>	<b>138,547</b>	<b>95%</b>

Notes to Table 5:

<sup>1</sup> Includes RES multiplier for in-state solar installations prior to December 31, 2005.

<sup>2</sup> Annualized energy production.

NOTE: A more detailed analysis of the DE target achievement is outlined in Table 9.

## 2. Incremental vs. Absolute Distributed Energy RES Requirements

While the absolute 2010 DE requirement exceeded the amount of DE APS actually received on its system through customer installations, the year-over-year or incremental growth in the DE program in 2010 closely tracked the growth anticipated by the RES. Meeting the incremental DE requirement is a strong indicator of the health and overall success of the DE incentive programs. This accomplishment is important to note, not only because of the challenges the Company faced with the administration of the rapidly increasing demand in 2010, but also because of the challenges of sustaining the program within the approved budget.

### APS's total DE installations and reservations in 2010 more than doubled those in 2009.

Further, APS's actual installations, including reservations in 2010, far exceeded the Company's DE RES requirement. By year end 2010, APS's total installations and reservations totaled 383,845 MWh, which translated to 277 percent of APS's 2010 DE compliance. Table 6 contains further detail on the absolute and the incremental DE growth requirements.

Table 6:  
2010 Distributed Energy Target Detail (in MWh)

	<u>Targets</u>	<u>Actuals<sup>1</sup></u>	<u>% Achievement of DE Target (Actuals Only)</u>	<u>Actuals with Reservations<sup>2</sup></u>	<u>% Achievement of DE Target (w/Reservations)</u>
<b>2009:</b>					
Residential	42,260	31,227	74%	40,974	97%
Non-residential	<u>42,260</u>	<u>18,158</u>	43%	<u>110,672</u>	262%
Total	84,520	49,385	58%	151,646	179%
<b>2010:</b>					
Residential	69,274	70,969	102%	81,544	118%
Non-residential	<u>69,273</u>	<u>60,444</u>	87%	<u>302,301</u>	436%
Total	138,547	131,413	95%	383,845	277%
<b>Year over Year Incremental:</b>					
Residential	27,014	39,742	147%	40,570	150%
Non-residential	<u>27,013</u>	<u>42,286</u>	157%	<u>191,629</u>	709%
Total	54,027	82,028	152%	232,199	430%

Notes to Table 6:

<sup>1</sup> Actual installations completed through December 31, 2010.

<sup>2</sup> Actual installations completed and funding issued through December 31, 2010.

## 3. Distributed Energy Costs

The following cost per MWh calculations reflect the DE incentive costs under APS's RES program for each technology. The "Total Incentive (\$)" column of costs shown in Table 7 is based on the UFI and PBI paid by APS and does not include any installation costs paid by the participant.

**Table 7:  
2010 Distributed Energy Incentive Costs**

	<b>Up-Front Incentives (\$/MWh)<sup>1</sup></b>		<b>Total Incentive (\$)</b>	
<b>Residential:</b>				
Solar Electric <sup>2</sup>	\$ 144.22		\$ 44,647,159	
Wind	121.17		24,050	
Geothermal Space Heating	83.13		782,120	
Solar Space Heating	138.56		46,393	
Solar Water Heating <sup>3</sup>	66.36		3,748,150	
Solar HVAC	-		-	
<i>Subtotal: Residential</i>	<i>\$ 130.98</i>		<i>\$ 49,247,872</i>	
	<b>Up-Front Incentives (\$/MWh)<sup>1</sup></b>	<b>Production Based Incentives (\$/MWh)<sup>4</sup></b>	<b>Total incentives paid in 2010(\$)</b>	<b>Cumulative PBI Lifetime Commitment (\$)</b>
<b>Non-Residential:</b>				
Solar Electric	\$ 82.18	\$ 169.49	\$ 12,702,843	\$ 274,494,650
Wind	146.72	-	19,200	-
Biogas - CHP Electric	-	15.54	35,766	805,745
Biogas - CHP Thermal	-	6.10	9,920	292,896
Geothermal Space Heating	-	-	-	-
Solar Space Heating	69.14	-	548,361	434,978
Solar Pool Heating	15.65	-	77,552	164,173
Solar Daylighting	-	-	-	-
Solar Water Heating	40.05	-	229,819	10,132,864
Solar HVAC	-	70.14	33,267	7,577,634
<i>Subtotal: Non-Residential</i>	<i>\$ 76.61</i>	<i>\$ 147.84</i>	<i>\$ 13,656,728</i>	<i>\$ 293,902,940</i>
<b>Total DE Incentive Costs</b>			<b>\$ 62,904,600</b>	

*Notes to Table 7:*

<sup>1</sup> Based on expected annual system production.

<sup>2</sup> Average incentive paid in 2010 was \$2.25/kW for residential Solar Electric (PV).

<sup>3</sup> Average incentive paid in 2010 was \$0.67/kWh for residential Solar Water Heating.

<sup>4</sup> Based on contractual annual system production.

#### 4. Up-Front Incentive Program

During calendar year 2010, the Company shifted funds into the residential incentive budget from other RES budgets and a new mechanism was created for residential incentives.<sup>19</sup>

The authorized UFI program budget approved in APS's 2010 RES Implementation Plan was \$44.1 million in 2010. An additional \$6 million in reservations for the residential UFI program were accepted as a result of funding shifts to the residential incentive budget. In 2010, residential incentive reservations totaled \$50.1 million. Additionally, \$1.2 million was transferred to the non-residential UFI program, for a total of \$3.2 million of available funding for non-residential projects. UFI program results and fund transfers that occurred in 2010 are outlined in Table 8.

<sup>19</sup> APS filed a Request for Clarification and Modification of Residential Incentive on August 2, 2010 (Docket No. E-01345A-09-0338), in which it notified the Commission of its intent to shift RES funds into the residential incentive program. In addition, under the same docket, the Company filed a letter dated October 14, 2010 notifying the Commission of another shift of funds within the RES budget.

**Table 8:**  
**2010 Distributed Energy: Up Front Incentive (UFI) Budget Results**

	Residential Incentives (\$)	Non-Residential Incentives (\$)	Total UFI Commitment (\$)
Installed	\$ 49,247,872	\$ 8,708,907	\$ 57,956,779
Reserved	19,945,001	21,078,342 <sup>1</sup>	41,023,343
<b>Total</b>	<b>\$ 69,192,873</b>	<b>\$ 29,787,249</b>	<b>\$ 98,980,122</b>
Starting UFI Budget	\$ 44,100,000	\$ 2,000,000	\$ 46,100,000
Net Budget Transfers <sup>2</sup>	6,000,000 (a), (c)	1,200,000 (b)	7,200,000
<i>Subtotal: Updated UFI Budget</i>	<i>\$ 50,100,000</i>	<i>\$ 3,200,000</i>	<i>\$ 53,300,000</i>
Prior Year Committed Carryover			\$ 38,701,289
<b>Total Available UFI Budget</b>			<b>\$ 92,001,289</b>

*Notes to Table 8:*

<sup>1</sup> The majority of these funds are utilized as reservations for the 2009 schools UFI program.

<sup>2</sup> Budget Transfer Activities:

(a) A budget transfer of \$2,800,000 was made from the PBI program to the residential UFI program in June 2010.

(b) A budget transfer of \$1,200,000 was made from the PBI program to the non-residential UFI program in June 2010.

(c) A budget transfer of \$3,200,000 was made from 2009 uncommitted funds to the residential UFI program in October 2010.

More commercial systems were installed under the PBI program in 2010 than in all previous years combined. While not included within this report, 10 MW of additional solar capacity was installed in the first quarter of 2011.

**5. Production-Based Incentive Program**

In 2010, APS accepted 159 reservations totaling approximately \$9.8 million in annual commitments for the PBI program. A total of 60 projects were installed in 2010, of which 45 projects were reserved prior to 2010 and 15 projects which were reserved in 2010. Actual incentives dispersed for these completed projects equaled approximately \$8,000. The projects completed in 2010 will require an annual commitment of \$240,510, and a lifetime commitment of \$3.2 million. When all current project reservations are successfully completed, the total contract life PBI program commitment will equal \$293.9 million.<sup>20</sup> Table 9 provides additional detail.

Due to APS's greater enforcement of project development timelines consistent with the Distributed Energy Administration Plan ("DEAP"), the Company cancelled a large number of projects during the fourth quarter of 2010. Because these cancellations occurred during the last nomination period of the year, APS was unable to reallocate these funds within the 2010 program. Consistent with program administration, APS will reallocate the remaining PBI lifetime authorization of \$26.1 million within the 2011 RES program, and will allocate the funding evenly among the nomination periods within the appropriate categories.

<sup>20</sup> Pursuant to Decision No. 71459, APS was authorized an additional \$100 million per year lifetime commitment authorization.

Table 9:  
2010 Distributed Energy: Production Based Incentive (PBI) Budget Results

	<u>PBI Reservations</u>	<u>Paid Incentive in current year</u>	<u>Annualized Commitment (\$)</u>	<u>Lifetime Commitment (\$)</u>
<i>Pre-2010 Projects:</i>				
Completed	45	\$ 4,939,833	\$ 5,958,575	\$ 86,418,592
Extended Reservations <sup>1</sup>	15	-	4,481,238	61,397,493
<i>Subtotal: pre-2010 Projects</i>	<u>60</u>	<u>\$ 4,939,833</u>	<u>\$ 10,439,813</u>	<u>\$ 147,816,085</u>
<i>2010 Projects Only:</i>				
Completed	14	\$ 7,988	\$ 240,510	\$ 3,248,442
Reserved <sup>1</sup>	145	-	9,602,833	142,838,413
<i>Subtotal: 2010 Projects</i>	<u>159</u>	<u>\$ 7,988</u>	<u>\$ 9,843,343</u>	<u>\$ 146,086,855</u>
<b>Total PBI Program</b>	<b>219</b>	<b>\$ 4,947,821</b>	<b>\$ 20,283,156</b>	<b>\$ 293,902,940</b>
<i>Starting Lifetime PBI Budget<sup>2</sup></i>				\$ 220,000,000
<i>Lifetime PBI Budget authorization<sup>3</sup></i>				\$ 100,000,000
<i>Total Lifetime PBI Budget</i>				\$ 320,000,000
<i>Remaining Lifetime PBI Budget Commitments</i>				\$ 26,097,060

<u>DE RFP</u>	<u>Reservations</u>	<u>Paid</u>	<u>Annual</u>	<u>Lifetime</u>
Aggregator	1	\$ -	\$ 5,951,250	\$ 119,025,000
Bagdad	1	\$ -	\$ 2,576,580	\$ 66,991,084
DV Schools	1	\$ -	\$ 601,698	\$ 12,033,981
Reserved	3	\$ -	\$ 9,129,528	\$ 198,050,065
<i>DE RFP authorization<sup>4</sup></i>				\$ 225,000,000
<i>Remaining Lifetime DE RFP Budget Commitments</i>				\$ 26,949,935

Notes to Table 9:

- <sup>1</sup> An additional 14 projects have been completed since December 31, 2010.
- <sup>2</sup> Pursuant to Decision No. 71254, the total lifetime PBI budget through and including 2010 is \$220 million of total contract commitments.
- <sup>3</sup> Pursuant to Decision No. 71459, APS was authorized an additional \$100 million per year lifetime commitment authorization.
- <sup>4</sup> Pursuant to Decision No. 72022, \$25 million of the originally approved \$250 million DE RFP budget was moved to the Company's Innovative Renewable Energy Project Initiative.

APS exceeded the residential DE target for the first time in program history.

## 6. Residential Program

In 2010, APS managed significant increases in customer inquiries, applications submitted, reservations, and installations within the residential DE program. This increased activity occurred even though APS established multiple incentive funding step-downs and implemented incentive tranches mid-year in an effort to sustain program funding through the end of the year. APS attributes the significant increase in residential system installations to a decline in system cost coupled with the demand created by decreasing incentives. Together, these allowed the Company to fund more systems without increasing the total RES cost to APS customers. In addition, APS reallocated the budget within its DE program, shifting funds to support the residential program from the non-residential program when forecasted non-residential program spending did not materialize. This shifting of funds did not prevent any installations under the non-residential DE program. These combined actions provided support to manage the substantial increase in volume throughout the residential program.

In 2010, APS processed incentive payments for a total of 4,923 residential systems which, when production from these systems is combined, brings the total residential DE annual energy production to 70,969 MWh.<sup>21</sup> The number of systems installed is a 65 percent increase over the number of installations in 2009, which was also a year of tremendous growth for the residential incentive program.

**New residential DE systems displaced 70,969 MWh, the equivalent of taking over 4,700 cars off the road.**

#### Residential – Key Events

##### 1) Continuation of 2009 Trends

APS reported in its 2009 Compliance Report that several factors contributed to both program activity and cost trajectories related to residential solar deployment. APS has continued to observe several of these trends and makes the following key observations for 2010:

- Increase in the number of developers and installers  
With continued high levels of growth in the residential program, 2010 saw the greatest number of both new and total installations and development companies in the DE market since program inception. In 2010, the number of installers present within APS’s territory increased to 248 photovoltaic installers and 120 Solar Water Heater (“SWH”) installers. Saturation of installation providers within the industry, along with gradually declining incentive levels, may introduce a trend of consolidation among DE service providers as the competition for customers and incentive funding increases.
- Declining panel pricing resulting in lower system prices  
System price declines have moderated from the strong downward trends reported in 2009. The average installed cost of residential solar electric systems continues to decline from the \$6.00 per watt level of 2009. APS witnessed a gradual decrease in cost per watt concurrent with each incentive decrease.
- Increase in average system size  
In 2009, APS reported an average installed photovoltaic system size of 6 kWdc. The decreasing cost of systems and solar panels in 2010 has contributed to a continued increase of average system sizes, resulting in a 2010 average residential system size of 7.1 kWdc.
- Proliferation of third party owned systems - Leases and Retail PPAs  
In 2010, APS saw a significant increase in the number of applications under a lease or retail PPA (also known as a Solar Service Agreement (“SSA”)). Residential leased systems often leverage the non-residential economics and remove up-front barriers for some customers. On average, these leased systems result in a higher installed cost per watt than the average customer-owned system.

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<sup>21</sup> These incentives were issued for 2,860 photovoltaic systems, 2,021 solar water heaters, and 42 others (including wind, solar space heating, solar HVAC and geothermal space heating systems).

- Residential demand exceeds authorized incentive budgets

The amount of incentive funding requested by customers outpaced available budgets and, as previously described, required the development of funding cycles and budget tranches to help pace the market and budget allocation over the year. The 2011 Implementation Plan established a process for residential incentive funding which seeks to moderate the pace and volume of incentive reservations and payments across the calendar year.

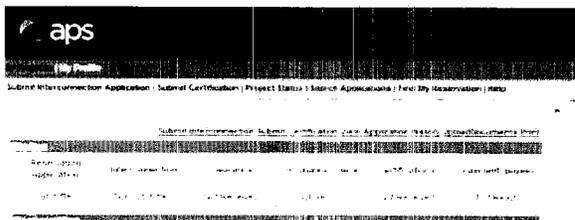
**APS implemented incentive step-downs and budget reallocations, which allowed APS to sustain program continuity throughout 2010.**

*2) Incentive Step-downs, Tranches, and Budget Allocations*

During the first quarter of 2010, the residential DE program participation far exceeded both historical activity and forecasted participation rates as part of the Company's 2010 RES Implementation Plan. As a result, the \$44.1 million approved for these incentives was expected to be depleted before June 2010. To preserve the funding for residential installations, APS requested that the Commission make an expedited determination regarding the level of residential incentives. The

Commission approved APS's request to lower the residential UFI from \$3.00 per watt to \$2.15 per watt.<sup>22</sup> In this Decision, the Commission also ordered APS to further reduce the incentive to \$1.95 per watt once the Company reserved 3 MW of capacity within the residential program, which occurred on April 2, 2010.

In addition, APS was ordered to implement three tranches of funding for 2010. The first tranche ran from April 1 through July 1, 2010, the second tranche from July 2 through October 1, 2010, and the third tranche from October 2 through December 31, 2010. The Commission also approved APS's proposal to reallocate \$3.2 million in funding to photovoltaic residential incentives from forecasted 2010 Renewable Generation funds that would not be needed to meet anticipated contract commitments in 2010. This additional funding reduced the waiting list and, together with a reduction in incentive levels, allowed the Company to fund more projects than originally anticipated at the \$3.00 per watt rate. Despite the reductions in the incentive levels throughout the year, the number of applications received in 2010 was significantly higher than that of 2009.



*3) Renewable Program Management Online Transaction Management Platform*

In October 2010, APS launched the Renewable Program Management ("RPM") tool, an on-line transaction management platform that created a

streamlined electronic process allowing for real-time reservation notification, automated customer/provider communications, automated payment processing, and discrete project tracking for residential customers. In addition, the customer now has the ability to log into their online account and track the status of their system. The increased availability of information reduced customer questions and calls to

<sup>22</sup> Decision No. 71686 (April 30, 2010)

APS, creating more efficient transactions. The functionality of the online system was also extended to installers and developers, who now have the ability to track all of their jobs online and submit interconnection applications and other documents directly to APS.

#### 4. Solar Water Heater Inspections

During the third quarter of 2010, APS implemented its SWH inspection pilot program. The goal of the pilot program was to determine if systems were being installed according to the Solar Rating and Certification Corporation ("SRCC") OG-300 Design and Installation Guidelines. The pilot was conducted from August to September and included 150 randomly selected sites where SWH systems were installed in 2009. APS partnered with the Arizona Solar Center to conduct the actual site visits. The site visit included a 53-point evaluation of SRCC OG-300 guidelines. The results showed that many of the 150 sites included in the pilot program did not meet all of the SRCC OG-300 guidelines. APS followed up with the installers and allowed them until January 1, 2011 to make corrections to the installations. After January 1, the Arizona Solar Center contacted the installers to schedule a follow up visit. Results of the second visit were communicated to the customer. As a result of the pilot program, APS integrated a standardized SWH inspection program into the normal incentive program operations in November 2010.

In 2010, APS installed and reserved 302,301 MWh, or 89 MW of non-residential customer-sited generation, a 173 percent increase from 2009.

#### 7. Non-Residential Program

Non-residential DE incentive program demand also increased substantially in 2010. APS installed and reserved 302,301 MWh, or 89 MW of non-residential customer-sited generation in 2010, compared to 110,672 MWh, or 46 MW in 2009, demonstrating nearly a 173 percent increase in production from 2009.

#### Non-Residential – Key Events

##### 1) Regulatory Environment

Non-residential customers face an array of issues in seeking DE solutions, including limited access to capital and challenges in monetizing tax credits. As a result, 2009 and 2010 showed an increasing trend toward utilization of third-party ownership through a Retail Power Purchase Agreement (often called an SSA), which are structured to allow customers to receive the benefit of a renewable energy system without the need to pay the up-front capital or maintain the system.

In 2009, the Commission began an adjudication process to determine whether third-party owned solar systems on schools, government facilities and non-profits should be regulated as Public Service Corporations. At the time of the adjudication, APS had already received numerous applications for third-party ownership of DE systems on customer property, and as a result, many projects were put on hold until the Commission reached a final decision in July 2010.

While the PBI program experienced an increase in overall demand, the actual number of installations for the year was less than expected, likely as a result of increased uncertainty throughout the year as described above. After the

Commission's decision in that adjudication,<sup>23</sup> the PBI program regained momentum and, during the fourth quarter of 2010 and the first quarter of 2011, the Company has seen a surge in the number of non-residential installations resulting from reservations awarded over the last 18 months.

## *2) Deployment of Commercial Photovoltaic Systems*

In 2010, APS's non-residential program provided incentives that supported the development of several nationally recognized photovoltaic systems. The following are a few examples of these systems:

The Frito-Lay facility in Casa Grande is the result of a company-wide effort by Frito-Lay to become one of the top renewable energy friendly corporations in America. The company installed over 3 MW of photovoltaic capacity through APS's non-residential incentive program.<sup>24</sup>

Another nationally recognized photovoltaic installation is located at Cowley Companies, a Phoenix real-estate investment firm that installed a 2.4 MW system, one of the largest rooftop renewable energy systems in the nation.

Nestle Purina also installed a 412 kW photovoltaic system at its plant in Flagstaff, AZ in November 2010. This system is part of Nestle Purina's company-wide effort to become the leader in environmental sustainability in the pet food industry. All three of these commercial photovoltaic installations provided national recognition both for the company installing the system and for Arizona.

## *3) Schools and Government Program*

In 2010, APS introduced a program for schools, municipalities and other government entities as part of its DE program expansion. Beginning in 2010, \$15 million of the authorized \$100 million annual growth in the lifetime PBI authorization was allocated to this program.<sup>25</sup> APS reserved approximately 3.75 MW of capacity, installed approximately 670 kW, and reserved the entire budget of \$15 million for this program in 2010. APS provided incentive reservations to 12 customers for installations, and of these customers, two schools had systems installed by the end of 2010. All 12 entities that received a reservation are expected to be online by mid-2011 with a total expected production of approximately 6,060 MWh.

## *4) Program Maturation*

Beginning in the fourth quarter of 2010, APS increased enforcement of timeframes and milestones to ensure participants install their systems in accordance with timelines defined in the Company's DEAP. As part of this process, APS requests information from the participants once they achieve certain milestones, as detailed in the Customer Participation Agreement ("CPA"). Under the program, these projects have 365 days from the reservation confirmation date to have the requested systems commissioned. Once the participant reaches a 120-day milestone, the Company requests the customer to provide APS with information showing substantial progress on the installation of the system and to provide an estimated construction date. At this milestone, the participants must have their CPA completed and

<sup>23</sup> Decision No. 71795 (July 12, 2010).

<sup>24</sup> Prior to 2010, APS did not cap the maximum size of a non-residential DE application.

<sup>25</sup> Decision No. 71459 (January 29, 2010)

submitted to APS along with its interconnection application. Between 180 days and 270 days after the reservation has been confirmed, the participant will be notified of cancellation of the reservation if the participant has not been able to provide APS with the requested information or cannot reasonably justify a failure to do so. APS will only consider granting an extension to projects demonstrating an extenuating circumstance, which will be evaluated on a project-by-project basis. APS believes this increased enforcement will encourage participants to maintain the timeline defined in the CPA and will help ensure project delivery within the programmatic timeframes.

#### *5) Distributed Energy Request for Proposal*

APS signed three contracts as a result of its 2008 Distributed Energy Request for Proposal ("DE RFP"), as described below:

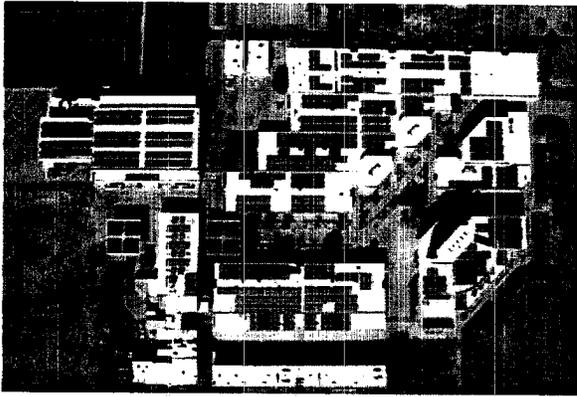
##### *Customer Aggregation Model*

APS's 2010 RES Implementation Plan included a Customer Aggregation Model under which APS would contract with a third party developer to phase-in projects over several years and have the ability to determine the optimal mix of customer installations and technologies needed to meet their fixed REC price to APS. In 2010, APS entered into a Distributed Renewable Energy Customer Procurement Agreement under this model. As part of this agreement, 25,000 MWh will be developed each year with a contract requirement of 75,000 MWh at full deployment. This program will begin in 2011 with 25,000 MWh of energy in the first year, and will add 25,000 MWh increments in both the second and third years of the agreement. Customers participating through this program will execute the standard CPA with APS, and follow a path similar to those customers participating in the PBI program with current reservations.

##### *Renewable Energy Credit and Energy Contract Model*

APS's 2010 RES Implementation Plan, as approved, included a REC and Energy Contract Model in which renewable energy systems would be installed by a developer at the customer's facility, APS would purchase all of the energy and associated RECs generated by the system, and the customer would contract with APS to purchase all of the renewable energy. On February 8, 2010, APS executed an agreement under this model with Freeport-McMoRan ("Freeport") and Recurrent Energy as a result of the DE RFP. Construction for the 15 MW photovoltaic system at Freeport's Bagdad mine in Bagdad, Arizona began in January 2011. The system is expected to produce approximately 30,000 MWh annually for 25 years. The estimated in-service date for this photovoltaic system is April 2012.

Decision No. 71958 required APS to report to Staff on a confidential basis 1) the annual kWh output of the Solar System, 2) the value of the Costs of Comparable Conventional Generation and the RECs, and 3) the amount deposited into the REST fund as a result of this transaction for the relevant reporting period. This information is not yet available as the system is still under construction; however, the Company will provide this information once the system is in-service.



### *SOLON Corporation and Deer Valley School District*

In 2010, APS signed a contract with SOLON Corporation ("SOLON") and Deer Valley School District ("DVSD") as result of the DE RFP. SOLON and DVSD entered into a partnership under the agreement to allow SOLON to install up to 5 MW of photovoltaic panels on five separate schools within the DVSD. Based on the terms of the agreement, DVSD will provide APS the RECs in return for a fixed PBI payment

for 20 years. In December of 2010, DVSD installed its first 1 MW photovoltaic system. The project includes 4,464 panels on nine buildings and two shade structures and is expected to produce approximately 1,520 MWh annually. Based on the terms of the agreement, SOLON and DVSD will install up to an additional 4 MW by December 2013.

## **8. Programs Introduced in 2010**

The APS Qualified Solar Installer program educates installers on specific issues related to APS's program and standards, ultimately benefiting all customers.

*Qualified Solar Installer Program.* In response to the significant increase in customer demand for DE and the explosive growth in the number of companies providing installation services over the last two years, APS launched the Qualified Solar Installer ("QSI") program in 2010. The QSI program trains installers from these companies on technical issues, APS incentives, contractor program requirements, customer service, and customer care. APS believes that customers will ultimately reap benefits from further education of installers on specific issues related to APS's program and standards. A total of 59 contractors completed the training in 2010. Consumer response to this program has been very strong, with more than 7,500 website hits to the dedicated QSI webpage in the first three months after launching the QSI referral site for customers.

*APS Energy Star and Solar Homes Program.* APS introduced this program in 2009 and expanded upon this effort with interested homebuilders in 2010. 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 the end-use customer. The key benefit to consumers is that solar systems are substantially less expensive when installed during construction rather than as a retrofit installation. APS estimates that installation during construction may result in savings of up to \$1,000 per kW installed for a photovoltaic system. Further, this program helps homeowners overcome the issue of financing since they can include it in the cost of their mortgage, rather than seeking credit to offset upfront costs for a retrofit installation. For homebuilders, including solar options is a way to differentiate their product and help drive additional sales in a slow economy. By the end of 2010, 12 builders were participating in the program, representing a total of 34 communities.

*Community Power Project – Flagstaff Pilot.* APS’s Community Power Project was approved by the Commission in Decision No. 71646 on April 14, 2010, and APS officially launched the pilot program in July 2010. The Decision established a 120-day window for third party vendors to sell customer-owned systems to be included in the pilot program, which closed August 13, 2010. During this window, APS received eight applications from customers within the project area, six of which did not meet

**Within four months of deployment of the Community Power Project – Flagstaff Pilot, 232 residential customers had applied for the program.**

the minimum technical qualifications to participate in the program and two of which were not pursued by either the customer or the vendor. Within five months of deployment of the APS program, 232 residential customers had applied for the program, and 31 of these systems totaling 108 kW were installed by December 31, 2010. In addition to the residential participants, eight non-residential customers qualified for the program. One of these customers, the Cromer Elementary School within the Flagstaff Unified School District, is expected to begin construction by the third quarter of 2011, coincident with the school schedule. At approximately the same time, APS also expects to begin construction of the Doney Park Renewable Energy Site.

As a result of Decision No. 71646, APS is required to report on program energy production or savings, program cost summaries and observations on system impacts. Observations on system impacts and operational savings will not commence until the entire project construction is complete. See Attachment 3 for the Program Cost Summary for 2010.

## **9. Key Learnings/Outlook/Enhancements**

Over the last nine years, APS has gained valuable experience in the administration of its renewable energy customer programs. Additionally, the level of activity in 2009 and 2010 has provided APS an opportunity to identify program areas to address when contemplating future program enhancements. Through continued observations of the program through 2010, APS has identified the following key areas of focus for 2011:

1. Managing the increasing volume of customer interest in the program;
2. Improving the Wholesale Distribution Interconnection process; and
3. Expanding the Schools and Government Program.

Through its 2011 RES Implementation Plan, APS is adopting a series of program improvements intended to build upon these objectives. This includes the following three initiatives, the impact of which will be reported in the Company’s 2011 Compliance Plan:

### Residential Incentive Funding Cycles and Reduction Triggers

In 2011, the Funding Cycles originally established in 2010 will be recalibrated to a quarterly schedule to better match the expected pace of customer requests and to simplify funding availability for customers. The residential incentive budget will be spread evenly across these four quarters, with incentive step-downs occurring if budget thresholds for that quarter have been reached. This approach is intended to

both simplify the residential incentive budget allocation process as well as ensure that adequate funding is available throughout the year.

#### Improvements to the Wholesale Distribution Interconnection Process for Renewable Energy Projects

APS has been authorized to manage a process for wholesale distribution interconnections that identify specific milestones for developers supplemented by deliverables provided by APS. This process will apply to projects not subject to a FERC-level interconnection process and is intended to deliver detailed project information to developers to improve project viability. The interconnection studies have also been incorporated into the Small Generation RFP solicitation in 2011, with opportunities for developers to become familiar with the program prior to submitting bids.

#### 2011 Schools and Government Program

This program was developed in compliance with the 2009 Settlement Agreement in order to provide opportunities for schools and government facilities, particularly in rural or economically challenged areas of the state, with opportunities to deploy solar with no up-front costs.<sup>26</sup> The eligibility criteria and program parameters were developed based on stakeholder input from schools, government entities, and developers, as well as Commission Staff. APS expects that participation in this program will increase the number of participating districts and government jurisdictions from existing program levels.

**APS continues to implement program enhancements and develop new strategies to manage the increased demand from customers for DE installations.**

#### **10. RES Compliance and Distributed Energy**

APS recognizes the importance of DE resources as part of the Commission's comprehensive renewable objectives. While APS was unable to meet the RES energy requirement for non-residential DE by December 31, 2010, APS continues to implement program enhancements and develop new strategies to manage the increased pace of DE installations. In 2010, APS exceeded its overall RES requirement and achieved 95 percent of its overall DE target. Further, APS installed and reserved projects that total 277 percent of its DE requirement. The results from 2010 demonstrated the increased growth within the

renewable energy market. Based on these results, APS is expected to meet or exceed its DE compliance in future years. Pursuant to A.A.C. R14-2-1815, this section of APS's 2010 Compliance Report serves as the Company's notice of noncompliance. At the time of the filing of this report, the Company has achieved compliance with all aspects of the 2010 RES DE requirement. Further, APS believes it is on target to exceed compliance in all aspects of the RES in 2011.

#### **11. Cost of Distributed Energy Shortfall**

Of the overall 2010 DE target of 138,547 MWh, 50 percent is required to be obtained from residential customers and 50 percent from non-residential customers. Utilizing

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<sup>26</sup> In compliance with Decision No. 71448, APS filed for approval of this program on April 29, 2010 and received Commission approval on February 11, 2011 as part of Decision No. 72022.

both the installation and reservation amounts in 2010, the total DE requirement is exceeded, with actuals representing 277 percent of the requirement. Both residential and non-residential customers exceeded the requirement, achieving 118 and 436 percent respectively. These relationships are shown in the far right column on Table 6 on page 16.

Based on the total number of installations plus reservations in 2010, APS does not have a cost of DE shortfall to report. These calculations are outlined in Table 10.

**Table 10:**  
**2010 Distributed Energy Shortfall Costs**

	<u>Residential</u>	<u>Non-Residential</u>
2010 DE Requirement (MWh)	69,274	69,273
<i>Actual Production (MWh)</i>		
UFI	70,969	8,557
PBI	-	38,032
Wholesale	-	13,855
Subtotal: Actual Production	70,969	60,444
2010 Actual Production Percentages (of target)	102%	87%
<i>2010 Reservations (MWh)</i>		
UFI	10,575	9,982
PBI	-	119,001
DE RFP	-	112,874
Subtotal: Reservations <sup>1</sup>	10,575	241,857
Total Distributed Energy with Reservations (MWh)	81,544	302,301
Compliance Shortfall/(Surplus) [with reservation adjustment]	(12,270)	(233,028)
<i>Distribution of Energy Shortfall (MWh)</i>		
UFI	-	-
PBI	-	-
<i>Shortfall Cost (\$/MWh)</i>		
UFI \$	-	\$ -
PBI \$	-	\$ -
<i>Cost to Make Up Shortfall (\$)</i>		
UFI \$	-	\$ -
PBI \$	-	\$ -
<b>Total Cost of the DE Shortfall</b>	<b>\$0</b>	<b>\$0</b>

Notes to Table 10:

<sup>1</sup> Assumes execution of all reservations existing as of December 31, 2010.

### **III. Non-RES Renewable Efforts**

#### **A. Green Choice Rate Program**

APS has three Green Choice rate offerings which were approved by the Commission in Decision No. 71276 in September 2009. In all cases, participating customers are paying a premium based on actual energy produced at Renewable Generation facilities that are part of the APS portfolio. GPS-1 provides a fixed level of "green" power that the customer subscribes to each month. GPS-2 varies month to month by customer and is based on a percentage of a customer's monthly usage. Finally, GPS-3 is a single block of "green" power that can be used for special events.

At the close of 2010, 3,277 customers were subscribed to the family of Green Choice rates. Sales for the year were approximately 122,764 MWh and the revenue collections were slightly over \$485,721.<sup>27</sup> The revenue associated with the Green Choice rates supplements the overall RES revenue collections, ultimately facilitating the development of additional renewable resources.

**At the close of 2010, 3,277 customers were subscribed to the family of Green Choice rates, an increase of 42 percent from 2009.**

#### **1. Green-e Certification**

Green-e is a national certification and verification program for renewable energy that was developed and offered by the Center for Resource Solutions, a national nonprofit organization. This certification indicates that the renewable energy meets environmental and consumer protection standards. Through certification, the APS Green Choice program utilizes the Green-e logo on the APS website. All of APS's Green Choice renewable energy is sold under the certification program. Green Choice Rate energy sales certification through the CRS program became effective September 26, 2008.

#### **B. Total Solar Rate Program**

Solar-3, also known as the Total Solar Rate, is designed to offer customers the option to purchase 50 percent or 100 percent of their usage from solar resources.<sup>28</sup> The rate became available for customer subscription on April 28, 2008. Revenue received from the Solar-3 rates reimburses the RES for solar generation output from APS owned facilities.

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<sup>27</sup> Green Choice sales are subtracted from total Renewable Generation, and are not counted toward compliance with RES targets.

<sup>28</sup> Approved by the Commission in Decision No. 69663 (June 28, 2007).

## IV. Non-Energy RES Components

### A. Marketing and Outreach

The overall objectives for APS's 2010 marketing efforts were to:

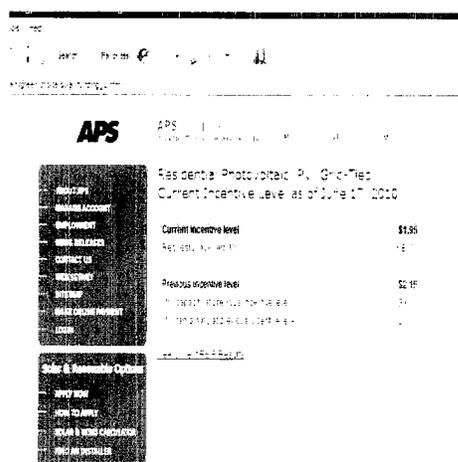
- 1) Increase transparency
- 2) Drive awareness
- 3) Motivate consumer adoption of renewables
- 4) Facilitate renewable energy purchases

APS continued to execute an aggressive multi-faceted marketing plan in 2010 to drive solar adoption among its customer base. The marketing budget spent and/or committed in 2010 was \$5.4 million. The marketing plan for 2010 included awareness building through multiple advertising vehicles such as TV, print, radio, bill messaging, targeted e-mail, and direct mail campaigns. To further community and customer education efforts, APS's marketing efforts included participation in more than 170 local events and the launch of a partnership with SmartPower, a national non-profit adept at grass roots marketing for solar. APS has also provided on-going support through a co-operative advertising program to enable installers to partner with APS to increase their overall advertising efforts. In addition, the marketing budget funded a significant number of programs to enhance the experience for customers in the market for solar (e.g., QSI and online educational tools).

The overall objectives for APS's 2010 marketing efforts are described below:

#### 1. Increasing Transparency of the RES Incentive Program

Due to the significant increase in customer demand for APS's renewable energy incentives in 2009, the Company realized the need for greater transparency for both installers and customers. In 2010, APS increased transparency through the following methods:

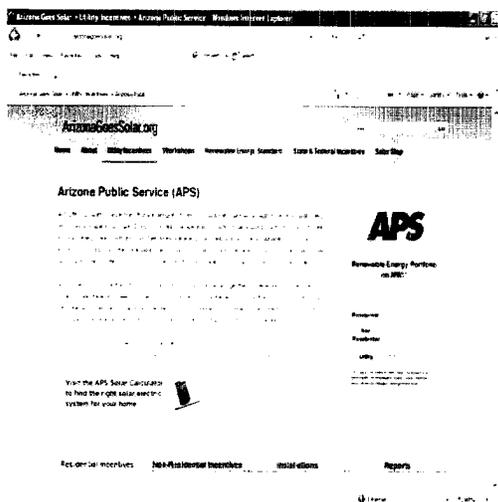


*Weekly, Quarterly and Yearly Reporting.* In order to provide its customers a greater insight into APS's RES incentive programs, the Company expanded upon its reporting mechanisms on [aps.com](http://aps.com) in 2010. Given the changes in the incentive levels throughout 2010 and the need to manage the residential incentive budget, APS began reporting on a weekly basis the current incentive level offered, number of residential applications received, the number of reservations issued and total funding remaining for the rest of the year. This enhanced reporting provided customers and installers greater transparency into APS's program so they could make an educated decision when choosing distributed renewable energy. In addition to the

residential weekly reports, APS also posted a quarterly report that informed customers of what the Company's total RES requirement was for the year and the progress at the end of each quarter towards that requirement. The report included

information on APS's residential and non-residential programs as well as the total current production for its renewable generation. Finally, APS files with the Commission this Compliance Plan each year detailing all of the Company's renewable energy transactions for the entire year. APS believes that by offering all of the information included in the reports posted on its website and filed with the Commission, customers are provided an abundance of information regarding APS's RES program.

*RPM - Online Transaction Management Platform.* APS's RPM system allows customers and installers to log on to an online website to track the status of their application in real time. Customers and installers have the ability to submit all of their required paperwork electronically, thus increasing the overall efficiency of the application process for both the applicant and for APS.



*ArizonaGoesSolar.org Website.* In 2010, APS, in collaboration with eleven other Arizona electric utilities, launched the ArizonaGoesSolar.org website. The purpose of this website was to create a single portal that serves as an educational tool for Arizona electric customers interested in renewable energy. The ArizonaGoesSolar.org website includes information about each of the participating utilities' RES programs and results of each of those programs to date. The APS section of the website also contains the Company's weekly residential reports as well as its non-residential quarterly reports and the status of application within its DE program. In addition, the website includes a solar map of Arizona that provides users with a summary of solar installations in any zip code within the state.

*Stakeholder Meetings.* In June 2010, APS met with stakeholders to review program issues prior to filing its 2011 RES Implementation Plan. Installers and developers provided input prior to filing the plan with the Commission. Additionally, APS also held a post-Implementation Plan stakeholder meeting in August 2010. The purpose of this meeting was to discuss APS's 2010 Implementation Plan with key industry stakeholders and to provide them with as much information as possible regarding all the key components of the filed Plan.

## **2. Driving Awareness of the Renewable Energy Incentive Program**

In 2010, APS aired TV and radio ads that were seen or heard more than 60 million times. As described in its 2010 marketing plan, APS's target audience was the 25 to 54 year old age group. APS successfully reached 99.9 percent of customers within this target group. Further, APS continued its upward trend in customer awareness of its RES program, in that 68 percent of consumers and 70 percent of business customers indicated that they were aware of the available DE incentive programs in December 2010.

Finally, APS had over 200,000 hits to its solar-related websites, surpassing the Company's planned 2010 year-end target of 150,000 website hits.

### **3. Motivating Consumer Adoption of Renewables**

APS engaged in multiple marketing efforts throughout the year to increase participation in the Company's renewable energy programs and to inform customers of the options available when choosing to install renewable generation. Below is a summary of these efforts and the associated results.

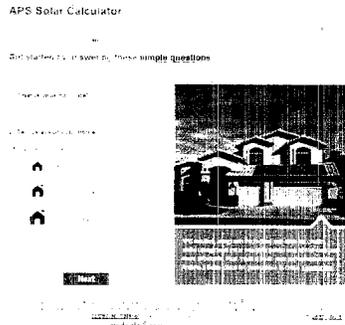
- APS aired TV and radio ads more than 6,000 times during a wide variety of programming at various times throughout the day to maximize reach of targeted customers.
- APS continued to make significant improvements to the renewable energy website, including streamlining web content and the launch of RPM, an online application and transaction management platform. The Company also launched the APS Solar Calculator to help customers understand the underlying costs of installing photovoltaic systems, the energy savings based on the installation, and the resultant payback period.
- To continue community and customer education efforts, APS participated in 173 events such as home shows, popular consumer events (concerts, sporting events) and green events, as well as trade shows and retail events.
- APS actively supported a cooperative advertising program in which the Company co-funded installers' advertising efforts. In addition, with the launch of the QSI program, APS created print ads to promote awareness of the program, and to provide consumers with needed direction on finding a competent installer.
- APS reached out to approximately 207,000 customers through multiple direct mail campaigns throughout the year. This included testing alternative messaging approaches and targeting, as well as the impact of follow-up direct mail and e-mail.
- The Company engaged customers through e-marketing efforts, which included both targeted e-mails promoting renewable options and inclusion in e-newsletters to the broader base of APS customers.
- Messaging promoting renewable energy options was included with the APS bill throughout the year. This effort included on-bill messaging, stand alone bill inserts, and insertion of messages in APS's customer newsletter.

### **4. Facilitating Renewable Energy Purchases**

Customers want to make an educated decision when purchasing solar panels or a solar water heater, and few people have buying experience in this area. APS has found that consumers are typically looking for guidance on system options, potential savings, selecting an installer, and the incentives and tax credits available. Below

are two programs APS introduced in 2010 to facilitate the renewable energy buying process.

**APS developed and deployed a solar calculator to help customers quantify savings potential and calculate payback for photovoltaic installations.**

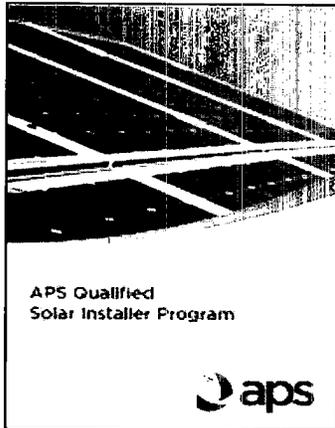


*The APS Solar Calculator.* APS’s customer research has consistently found that customers want to better understand the solar value proposition and the underlying financial benefits of solar. Therefore, in 2010, APS developed and deployed a solar calculator to help customers quantify savings potential and calculate payback for photovoltaic installations. This calculator provides customers with a realistic view of the financial benefits of solar and helps motivate them to solicit project estimates from contractors. APS will continue to make enhancements to the solar calculator based on customer feedback.

*The Arizona Solar Challenge - SmartPower.* In 2009, APS partnered with SmartPower to establish an Arizona affiliate, Arizona SmartPower, which focuses on community outreach efforts to drive awareness and adoption of distributed renewable energy. In 2010, APS collaborated with SmartPower to launch the Arizona Solar Challenge in the Sunnyslope area of Phoenix and in Flagstaff. Each community that participates in the Arizona Solar Challenge is challenged with increasing their installations by a set percentage over the course of the year.

In order to compete in the Challenge, each community passes a local resolution or similar action, committing to the tenants of the Challenge. Arizona SmartPower then engages local stakeholders within each community to build interest, awareness and support for the solar installation. When the community reaches the agreed upon number of residential solar installations, the community earns a special solar designation. APS and SmartPower have jointly participated in local events to help drive participation in the Arizona Solar Challenge.

In addition, SmartPower launched the Arizona Solar Coach, which provides customers in the market for solar with unbiased information about technology options, financing alternatives, system sizing guidance and accurate information about expected energy off-sets from the installation of a solar system. The Arizona Solar Coach is an important resource for customers considering participation in the wide variety of renewable energy options available today, including purchasing or leasing their own system. In total, the Solar Coach has worked with more than 150 APS customers in helping them make the choice to “go solar.”



*QSI Program.* APS has learned that customers need guidance on the selection of a qualified installer for their DE system. The industry has experienced explosive growth in the number of solar system installers over the past few years and consumers do not know who to entrust with their solar installation. Therefore, APS implemented the QSI program in 2010, which includes coursework on technical issues, APS incentives, contractor program requirements, customer service, and customer care. A total of 59 contractors completed training in 2010.

## **B. Research, Development, Commercialization & Integration**

### **1. Studies Performed**

APS's Renewable Energy Technical Services group is working to better understand how renewable energy impacts the utility's ability to provide reliable and affordable electricity to customers. As a key area under the 2010 Commercialization and Integration segment of the budget, APS initiated the Community Power Project - Flagstaff Pilot. In addition to deploying distributed energy rooftop solar within the Flagstaff region, the program includes a series of integrated studies that will build upon each other to provide actual data that will help APS understand the impacts and potential additive value of distributed generation on the utility distribution system. These studies were designed to create a platform in which the future distribution system (including such technologies as distributed generation, smart grid, and energy storage) will be studied as one integrated system.

APS also initiated or continued several other key studies and partnerships in 2010 to develop a broader understanding of technology and renewable energy potential in Arizona. Additional information about these studies is available at [www.aps.com/renewables](http://www.aps.com/renewables).

#### *a) High Penetration Photovoltaic Deployment Study*

In October 2009, APS, in collaboration with The General Electric Company, Arizona State University, National Renewable Energy Laboratory and Via Sol Energy Solutions (collectively the "Team"), received notice from the Department of Energy that the Team was awarded a grant to study the effects of high penetrations of distributed photovoltaic technology on a single distribution feeder. In 2010, the project Team completed all of the contract negotiations with sub-recipients and the Department of Energy and commenced Phase I of the study project. Phase I, which included extensive modeling of the existing distribution system, development of high resolution data acquisition systems and testing of grid-support inverters, is complete and in the reporting stages. Phase II of the project will commence in the second quarter of 2011. This project is one of six DOE grants awarded nationwide addressing the impacts of High Penetrations of Solar Distributed Generation. Additional information is available at [www.solarhighpen.energy.gov](http://www.solarhighpen.energy.gov).

*b) Photovoltaic Variability and Intermittency Study*

In 2010, APS initiated a study to collect and analyze a comprehensive set of solar and photovoltaic production data to study the variability and intermittency of solar energy production. This test program utilizes the Prescott Solar Facility owned by APS as a testing facility. Prescott Solar is measuring useful data to determine how much fluctuation of power, voltage, and/or current occurs at the output of the facility. Causes for these fluctuations are also being evaluated. Northern Arizona University is assisting in the collection, organization, and analysis of the data to support the resulting report, and the team is coordinating with National Laboratories on the final results.

*c) Energy Storage Demonstration Project*

In early 2010, APS issued a Request for Information ("RFI") seeking information on large scale commercial and utility batteries to initiate an electric energy storage project. Through the RFI results and further internal planning, APS released an RFP for Energy Storage Resources in Flagstaff and committed to battery technology and a project to commence in 2011. The energy storage project will address and demonstrate the values of distribution grid integrated energy storage, and the value of energy storage integrated with variable energy resources such as photovoltaic solar generation.

*d) Vehicle to Grid Study ("V2G")*

In 2010, APS engaged Navigant Consulting to conduct a V2G feasibility and cost benefit study. The study was broken into five tasks: 1) define electric vehicle technology and markets, 2) determine technology penetration, 3) determine impacts of electric vehicle charging on the APS distribution system, 4) define vehicle to grid, and 5) estimate V2G market penetration and APS impacts. This study was completed in March 2010 and an electric vehicle readiness development program was submitted to the Commission in October 2010.

*e) Geothermal Resource Assessment Review*

APS, in partnership with Salt River Project, worked with Geologica, Inc. to perform a statewide geothermal resource assessment study. This study compiled information presented in previously published reports and presented an assessment of existing and new geothermal technologies and their applicability to potential resource development within Arizona. This study was completed in early 2010 and provided information supporting the possibility of Arizona locations with limited geothermal potential; however, more extensive site testing will be required to determine the actual resource value.

**2. Research and Development Projects**

In 2010, APS continued work in or initiated the following commitments for research and development projects with study partners, including Arizona Universities:

*a) 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. APS has continued its involvement in this project by committing to Phase II funding and participation.

In 2010, the ASU team completed the following reports for the support of the development of the AzSMART interactive tool:

- Present and Future Cost of New Utility-Scale Electricity Generation – July 2010
- Regulation and Standards in the Energy Sector and their Effect on Solar Deployment – July 2010
- Market Based Incentives – November 2010

In addition to the reports mentioned above, the ASU project team has developed the integrated AzSMART tool in the ASU Decision Theater platform. The tool encompasses the following topics:

- Policy
- System Specifications
- GIS Siting
- Transmission Grid Impact
- Economic Consequences
- Environmental Impact
- Summary of Results

*b) AzRISE (University of Arizona) – Compressed Air Energy Storage ("CAES")*

In partnership with APS, AzRISE has prepared a study addressing the potential of CAES and the possible integration of the technology with the electric distribution system. The draft study was delivered to APS in the second half of 2010 and is currently being finalized with the final version expected to be completed in late March 2011.

The CAES report is divided into two areas of exploration: 1) an assessment of CAES technologies, costs and project development; and 2) the use of CAES and solar power generation for reducing peak demand on the grid.

*c) Distributed Wind Study (Northern Arizona University)*

This study investigated distributed residential wind energy and the existing homeowner valuation process. The following primary tasks were identified: Task 1 – determination of the process by which homeowners currently evaluate the potential of a residential wind energy system, Task 2 - determination of methods for improving the homeowner valuation process, and Task 3 - model the wind energy potential for distributed, small wind turbine installations.

The initial report was delivered to APS in early 2010 and presented the results of Tasks 1 and 2. The report showed that there was limited opportunity and long payback periods for small residential distributed wind systems in Arizona. Additionally, limited data, mapping or analysis for wind resources is available that would benefit residential wind customers. Task 3, which will address this data is ongoing and will be discussed in a subsequent report.

*d) Department of Energy Thermal Storage Demonstration*

APS is continuing to work with U.S. Solar Power Corporation on a five-year thermal research project with potential future demonstration at the Saguaro Solar facility. The project's primary objective is to maximize cost-effective, commercially-proven

energy storage for Concentrating Solar Power plants. This project is in its second prototyping phase studying two different energy storage technologies and continues to facilitate APS's understanding of alternative, economically viable storage technologies. Partners in this project include US Solar, Georgia Tech, and the University of Arizona.

ATTACHMENT 1

RES Banking Reconciliation

Table 11:  
2010 Renewable Energy Credit (REC) Bank Reconciliation

	MWh (energy)	
1		1
2		2
3		3
4	<i>Previous year end REC bank balance</i> <sup>1</sup>	315,571
5		5
6	<b>RES Requirements</b>	6
7	Total RES compliance requirement	692,737
8	Previous years bank applied to RES requirement <sup>2</sup>	315,571
9	<i>Remaining RES requirement (line 7 - line 8)</i>	377,166
10		10
11	<b>Renewable Energy Portfolio</b>	<b>Contribution</b>
12	Wind	529,674 64%
13	Geothermal	14,851 2%
14	Biomass	119,118 14%
15	Landfill Gas	17,880 2%
16	APS Solar <sup>3</sup>	13,598 2%
17	Distributed Energy	131,413 16%
18	<i>Subtotal: Renewable Portfolio</i>	826,534
19		19
20	<b>Year-End REC Bank Balance</b>	20
21	Current year renewable energy portfolio (line 18)	826,534
22	<i>Less</i> Current year remaining RES requirement (line 9)	377,166
23	<i>Less</i> Green Choice energy sales	122,764
24	<b>Current year ending REC bank balance (line 21 - line 22 - line 23)</b>	<b>326,604</b>
25	REC bank balance +/- from prior year (line 24 - line 4)	11,033
26	<i>Notes to Table 11:</i>	26
27	<sup>1</sup> See Attachment 1 to APS's 2009 RES Compliance Report dated April 1, 2010.	27
28	<sup>2</sup> For purposes of this calculation, APS has included the full amount of the prior year's balance.	28
29	<sup>3</sup> Includes RES multiplier for in-state solar installations prior to December 31, 2005.	29

ATTACHMENT 2

Schools Funded from 2009 UFI Funds - Total Production

	<b>School Funded from 2009 UFI Funds</b>	<b>In-service Date</b>	<b>Energy Produced in 2010 (kWh)</b>
1	Sedona Oak Creek Unified School District (Sedona Red Rock High School)	11/16/2010	29,775
2	Scottsdale Unified School District #48 (Desert Mountain High School)	8/26/2010	449,447
3	Agua Fria Unified School District (Desert Edge High School)	9/27/2010	209,113
4	Agua Fria Unified School District (Verrado High School)	7/12/2010	385,410
5	Paradise Valley Unified School District (North Canyon High School)	10/22/2010	40,472
6	Paradise Valley Unified School District (Pinnacle High School)	11/1/2010	2,568
7	Paradise Valley Unified School District (Shadow Mountain High School)	11/3/2010	101,069
8	Deer Valley Unified School District (Park Meadows Elementary School)	7/2/2010	107,606
9	Scottsdale Unified School District #48 (Copper Ridge School)	8/31/2010	136,411
10	Casa Grande Elementary School District #4 (Cholla Elementary School)	11/11/2010	96,880
	<b>TOTAL PRODUCTION IN 2010:</b>		<b>1,558,751</b>

ATTACHMENT 3

Community Power Project – Flagstaff Pilot Reporting

<b>Community Power Project - Flagstaff Pilot 2010 Program Cost Summary</b>	
<b>Description</b>	<b>Total Cost</b>
<b>Doney Park Renewable Energy Site installation</b>	\$77,208
<b>24 installed residential systems billed in 2010*</b>	\$484,746
<b>Capital cost for information technology:</b>	\$577,584
- Modification to APS billing system to allow for Community Power solar rate billing	
- Development and deployment of informational website	
- Modification to APS asset tracking system to accommodate photovoltaic equipment for warranty, accounting and inventory tracking	
- Modification to allow for system production output monitoring for reporting, system monitoring and the project study	
<b>Operations and Maintenance Costs:</b>	
- Administration	\$3,238
- Implementation (brass tags, dual meter adaptors)	\$95,363
- Site inspection	\$28,607
- Training	\$5,696
- Customer Acquisition Costs	\$9,810
<b>Total Program Cost for 2010</b>	<b>\$1,282,252</b>

\*A total of 31 systems were installed in 2010, however, to date, APS has only been billed for 24 systems.



January 14, 2011

Mr. Curt Brechtel  
Resource Acquisition Manager  
Arizona Public Service Company  
P.O. Box 53999, M.S. 9674  
Phoenix, AZ 85004

Re: Consulting Service Agreement No. 700552185

Dear Curt:

In December we put the finishing touches on our report for the 2010 RFP for Renewable Energy Small Generation Resources. A statement for services was sent to your accounting department.

The final report removed all confidential materials to avoid the need to redact information for a public version of the report. Accion Group found that the RFP was conducted in compliance with established RFP protocols, and the final selections made by APS were appropriate.

For your reference, we found the APS team to be professional in all aspects of the RFP and they were responsive to all inquiries and receptive to observations and suggestions for ways to improve the RFP process.

The professionalism of your team made it enjoyable to again work with APS. We appreciate having been selected as Independent Evaluator and look forward to the opportunity to work with you.

Sincerely,

A handwritten signature in black ink, appearing to read "Harold T. Judd".

Harold T. Judd  
President

MERRIMACK ENERGY GROUP, INC.

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March 8, 2011

Thomas Ramey  
Resource Acquisition  
Arizona Public Service Company  
400 North 5th Street  
MS 9674  
Phoenix, AZ 85004

Re: Certification Letter of Merrimack Energy Group, Inc. as Independent Monitor for Arizona Public Service Company's ("APS") 2010 Request for Proposals ("RFP") for Arizona Wind Generation Resources

Dear Mr. Ramey,

Merrimack Energy Group, Inc. ("Merrimack Energy") served as Independent Monitor ("IM") for Arizona Public Service Company's 2010 RFP for Arizona Wind Generation Resources. Merrimack Energy's role as IM began during the development of the RFP process and continued through the final selection of the preferred resources. The role of the IM in the competitive procurement process is to ensure the solicitation is conducted in a fair, unbiased, equitable, and transparent manner in accordance with the Certified Renewable Energy Competitive Procurement Procedure ("CPP"). The tasks and services performed by Merrimack Energy were consistent with the requirements of the CPP and Scope of Work for the Independent Monitor prepared by APS.

Merrimack Energy certifies that the RFP procedures followed by APS were consistent with the requirements of the CPP. The RFP procedures followed by APS and the bid evaluation and selection processes and methodologies represented a fair, consistent and unbiased evaluation and selection process. The procedures and processes were appropriately applied and are consistent with industry standards. The information included in the RFP, the evaluation process, and evaluation criteria are also consistent with the CPP requirements.

In the opinion of Merrimack Energy, the bid evaluation and selection process was undertaken by APS in a fair, consistent and comprehensive manner. In addition, in our view, this process was a very thorough, rigorous, and comprehensive evaluation and selection process, with every eligible bid scrutinized in detail. Both the quantitative and qualitative assessments were effectively undertaken, which should result in competitive prices and viable projects. The implementation of the solicitation process was effectively managed by APS, was conducted in conformance to the established schedule outlined in the RFP, and should lead to benefits to customers.

In addition, the bid evaluation and selection was undertaken in a consistent manner with all bids treated equitably and fairly. All bidders had access to the same information about the process and procedures at the same time. We also found the process to be well structured and managed within a consistent framework whereby all bidders had adequate information on which to base a well designed proposal.

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3100 Zinfandel Drive  
Suite 600  
Rancho Cordova, CA 95670  
916.631.3730 phone  
916.852.1073 fax

March 11, 2011

VIA E-MAIL

Mr. Curt Brechtel  
Resource Acquisition Manager  
Arizona Public Service  
400 North 5th Street, M.S. 9674  
Phoenix AZ 85004  
Curt.Brechtel@aps.com

Subject: CERTIFICATION OF THE ARIZONA PUBLIC SERVICE ("APS") 2010 REQUEST FOR PROPOSALS FOR PHOTOVOLTAIC GENERATION RESOURCES PROCESS

Dear Mr. Brechtel:

This letter serves as a certification by Navigant Consulting Inc. ("Navigant") concerning our review of the above mentioned APS 2010 Request for Proposals for Photovoltaic Generation Resources process (the "Process").

APS retained Navigant to serve as its independent auditor as required under its Renewable Energy Competitive Procurement Procedure (the "Procedure") dated April 10, 2007 (the "Procedure").<sup>1</sup> The Procedure identifies the policies and procedures that APS will use to procure renewable energy through both request for proposal and bi-lateral purchase approaches. The Procedure also identifies the scope of work for the independent auditor that is required under the RES Rules.

As independent auditor, we monitored and evaluated the solicitation, evaluation and selection process for new renewable resources that APS performed under the APS 2010 Request for Proposals for Photovoltaic Generation Resources (the "2010 RFP") including review of the solicitation materials, audit of the evaluations and preparation of a summary report to APS.<sup>2</sup>

As a result of this work, we certify that:

- the solicitation materials associated with the 2010 RFP were understandable, comprehensive and consistent with the requirements of the Procedure and with other request for proposals for renewable power supply that we have reviewed;

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<sup>1</sup> Arizona Public Service Company, Inc., Renewable Energy Competitive Procurement Procedure, April 10, 2007.

<sup>2</sup> Independent Auditor Report for the 2010 Photovoltaic Generation Resources Solicitation, Navigant Consulting Inc., September 29, 2010.

Mr. Curt Brechtel

March 11, 2011

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- the terms of the various certification, confidentiality, creditworthiness and other form documents were reasonable and consistent with others we have reviewed;
- the terms and conditions of the standard form power purchase agreement and Turnkey Agreement prepared by APS were reasonable and consistent.
- the submittal instructions and non-refundable bid fee were reasonable and the description of the evaluation process was clear;
- the presentations made at the pre-bid conference were clear and consistent with the Procedure and the RFP, and the questions and answers made available on the RFP website were also clear and consistent and valuable in further defining the solicitation;
- the evaluation process was performed on a logical, consistent, fair and reasonable basis, and were consistent with the requirements of the Procedure and with other power supply offer evaluation processes we have performed or observed;
- the threshold and screening processes were performed on a consistent and fair basis, and all necessary and typical costs (bid, integration, transmission, imputed debt) were included;
- the determination of the avoided cost of each offer through the use of production cost modeling was consistent and reasonable;
- the selection of the shortlist based on lowest cost, qualified offers was reasonable;
- the detailed evaluation performed was consistent and reasonable;
- the short-listed Respondents were given equal opportunity to meet with APS and provide additional information to improve their offers;
- the level of technical due diligence review was comprehensive and thorough;
- the transmission and credit reviews, and subsequent assignment of risk ratings to offers was reasonable;
- the price and non-price factors considered in selection of the Finalists was reasonable.

This Letter summarizes our review and conclusions concerning the Process as of the date of this Letter. In performance of our review, we have not attempted to influence the preparation of the solicitation documents, nor the performance of the evaluation by APS, nor the discussions between APS and the Respondents, nor the selection of offers by APS. We have not performed any independent alternate evaluation or selection of offers. We have relied on documents, correspondence, analyses and information provided to us by APS. We did not review the detailed analyses of all the offers, but rather only a representative sample of the offers that we felt would indicate whether or not the evaluations were performed on a fair and reasonable basis (for example, power purchase versus asset purchase, shortlisted versus not shortlisted). While we believe these source documents to be reliable, they have not been independently verified for either accuracy or validity, and no assurances are offered with respect thereto. Similarly, we were not a party to phone conversations or meetings that APS may have had with the Respondents, although we did review correspondence posted on the RFP website and attended the pre-bid meeting between APS and the potential Respondents.

Mr. Curt Brechtel  
March 11, 2011  
Page 3 of 3

This Letter considers only the reasonableness and fairness of the Process. It does not represent any endorsement of the offers selected by APS, nor any guarantee that the offers are valid or will be ultimately delivered, nor that the offers will satisfy the Annual Renewable Requirements of APS. We make no representations, warranties or opinions concerning the enforceability or legality of the laws, regulations, rules, agreements or other similar documents reviewed as part of this evaluation. We express no recommendation, opinion, or advice as to the wisdom, desirability, or prudence of contracting with the Respondents, or to the action any person should take in connection with the offer, issuance, purchase, or sale of securities or contracts related to APS or the Respondents. Navigant and its employees are independent contractors providing professional services to APS and are not officers, employees, or agents of APS.

Sincerely,



Paul D. Maxwell  
Director