



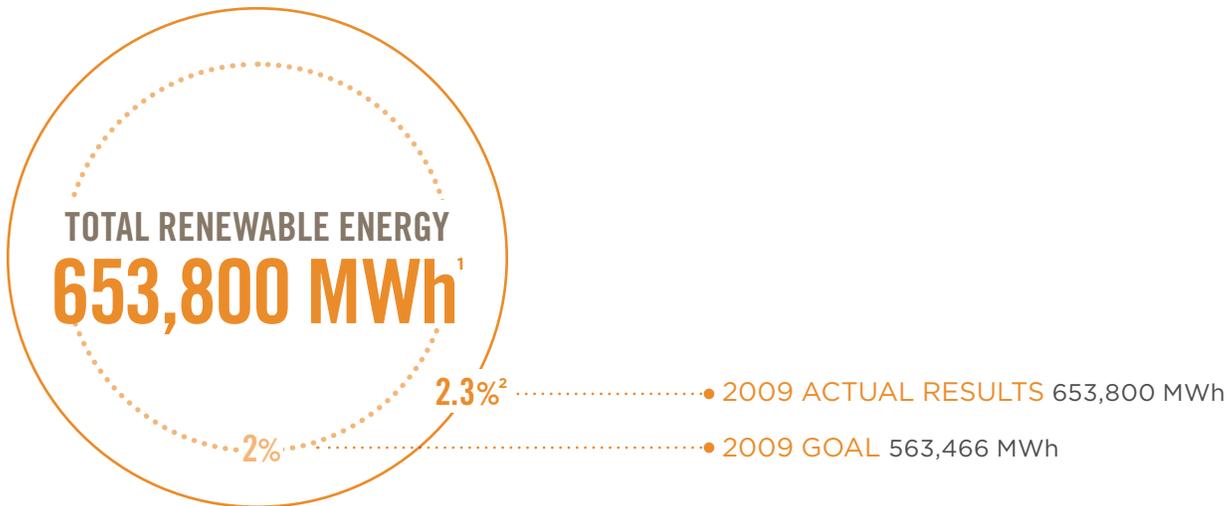
ARIZONA'S ENERGY FUTURE

# 2009 Renewable Energy Standard Compliance Report



# 2009

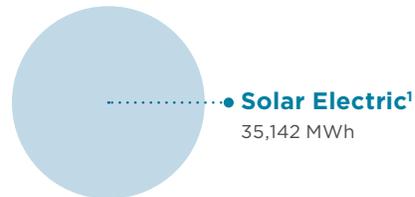
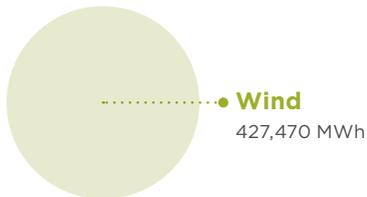
## Banner Year for Renewables at APS



### HOW APS ACHIEVED THIS AMOUNT IN 2009

RENEWABLE GENERATION TOTAL 604,414 MWh

DISTRIBUTED ENERGY TOTAL 49,386 MWh



<sup>1</sup> Total megawatt hours provided to retail customers; Includes solar multipliers and 63,219 MWh sold under Green Choice rates.

<sup>2</sup> Percent of energy provided to customers that is coming from renewable resources.

# Renewable Generation

## 2009 Results

**ACTUAL** 604,414 MWh<sup>1</sup>  
**GOAL** 478,946 MWh

### NEW IN 2009

1



**HIGH LONESOME WIND RANCH**  
100 MW Wind  
Commercial Operation: July 2009  
107,838 MWh in 2009<sup>2</sup>

2



**GLENDALE LANDFILL**  
2.8 MW Biogas  
Commercial Operation: January 2010  
Sent test energy in December 2009<sup>3</sup>

### INSTALLATIONS PRIOR TO 2009

3



**STAR CENTER**  
(and other solar across AZ)  
5.6 MW  
Photovoltaic Solar  
9,537 MWh in 2009

4



**SNOWFLAKE**  
24 MW  
Biomass  
93,890 MWh in 2009

5



**SALTON SEA**  
10 MW  
Geothermal  
67,290 MWh in 2009

6



**ARAGONNE MESA**  
90 MW  
Wind  
266,322 MWh in 2009

7



**SAGUARO**  
1 MW  
Concentrating Solar  
506 MWh in 2009

8



**SOLANA**  
(Future Project)  
280 MW  
Concentrating Solar  
903,349 MWh Planned

## EXCEEDING COMPLIANCE REQUIREMENT FOR UTILITY-SCALE SOURCES

For 2009, the Arizona Corporation Commission's Renewable Energy Standard (RES) requirement for sources of renewable energy coming from utility-scale projects (where the energy is produced at a central location and distributed to multiple customers) was 478,946 megawatt hours (MWh). APS **exceeded this requirement by 25 percent** by providing 604,414 MWh.<sup>1</sup> Achievement beyond compliance was buoyed by energy from two new projects coming on line, the High Lonesome Wind Ranch and the Glendale

Energy Landfill. APS receives the energy from these projects through a purchase power agreement signed with each of the project's owner.

### FUTURE

The company continues to engage the energy markets to identify new renewable resource opportunities. In March 2009, APS initiated a request for proposal (RFP) for small generation projects. APS anticipates this RFP will result in several small photovoltaic projects being developed across Arizona in the coming years.



<sup>1</sup> 541,195 MWh counts toward RES compliance. The additional 63,219 MWh was sold under Green Choice rates.

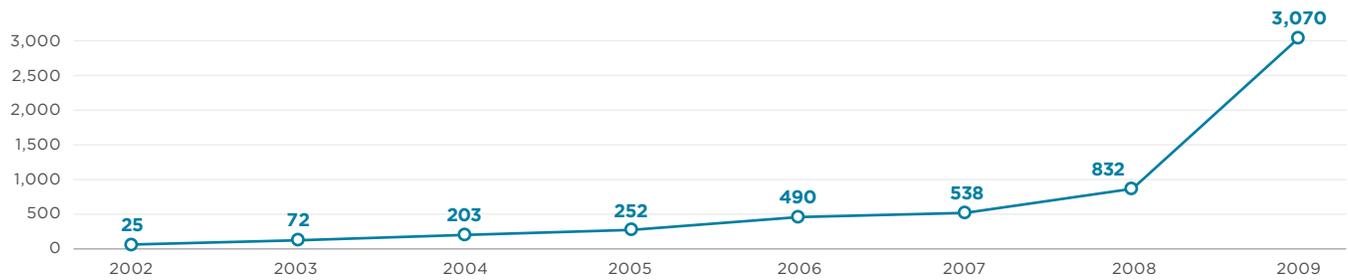
<sup>2</sup> Expected to produce approximately 300,000 MWh in a full year.

<sup>3</sup> Expected to produce approximately 21,000 MWh in a full year.

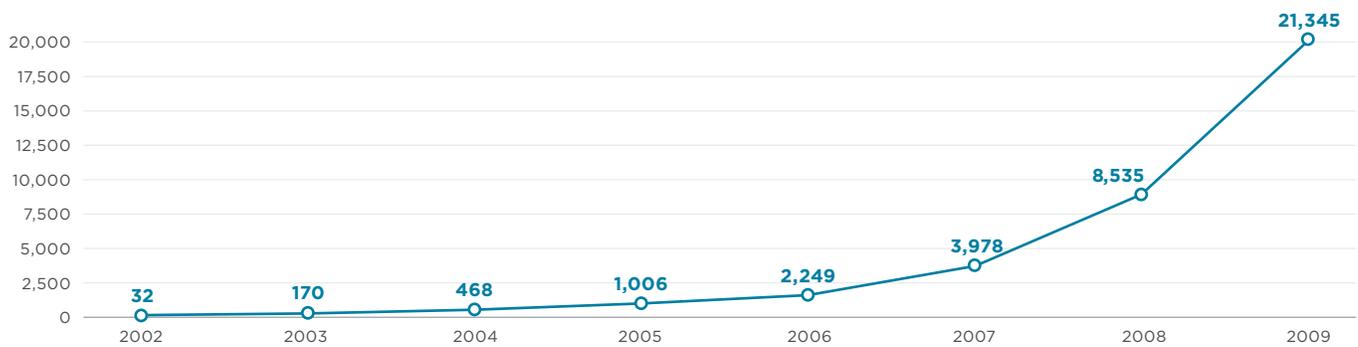
# Distributed Energy

## More Solar Systems Were Installed in 2009 Than in the Last 8 Years Combined

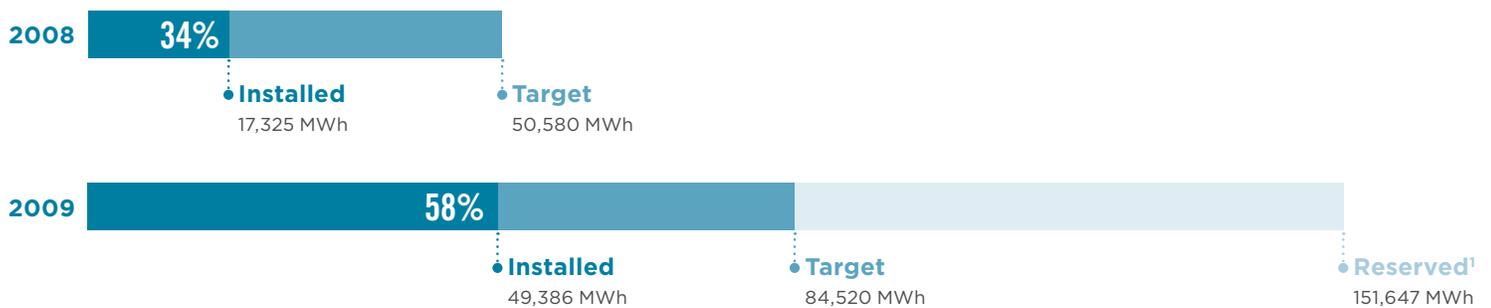
### INSTALLATIONS BY YEAR



### TOTAL INSTALLED KILOWATT CAPACITY BY YEAR



### PERCENT OF DISTRIBUTED ENERGY TARGET ACHIEVED



<sup>1</sup> Total new distributed energy based on incentives reserved in 2009.

## POSITIVE TRENDS IN THE GROWTH OF CUSTOMER-SITED RENEWABLE ENERGY

### AVERAGE SIZE SOLAR SYSTEM INSTALLED



### COST PER WATT



### NUMBER OF SOLAR DEVELOPERS IN ARIZONA



## APS Broadens Reach



### DISTRIBUTED ENERGY ASSISTANCE PROGRAM

In 2009, APS provided \$300,000 to help low-income customers install solar electric systems and solar water heaters. All told, the program will be displacing 101,667 KWh of energy and producing 45,704 KWh of electricity annually.



### SCHOOL & GOVERNMENT PROGRAM

APS filed a request with the Arizona Corporation Commission to transfer unused incentive funds into a separate funding category for schools and government entities. This resulted in APS reserving \$16,216,313, which will be used to produce approximately 6,062,038 KWh annually.



### SOLAR PHOENIX

In a joint collaboration between the Mayor of Phoenix, National Bank of Arizona and SolarCity, APS and its partners are providing nearly 1,000 Phoenix homeowners, including low-income homeowners, solar panels with no up-front costs. Solar Phoenix is the largest program of its kind in the country and serves as a national model for distributed programs.



### ENERGY STAR AND SOLAR HOMES PROGRAM

APS is helping reduce the cost of solar installations by providing home builders incentives for making solar water heaters, solar electric systems or the infrastructure to add such systems a standard option on new homes. Since the program's inception in July 2009, some of the largest and most-respected home developers have signed up for the program.

# Renewable Energy Incentive Program

## Building Awareness Through Multiple Channels

1



### TV & RADIO

In total, there were more than 10,000 airings of APS's TV and radio ads during a wide variety of programming and times of day to maximize reach.

2

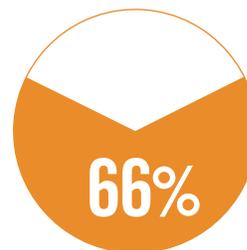


### WEB SITE

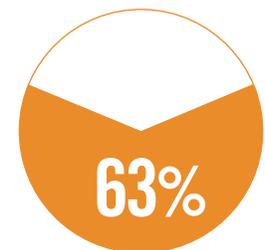
In October, APS launched a refreshed and more user friendly and informative web site.

## Program Awareness

### CUSTOMER AWARENESS IN 2009

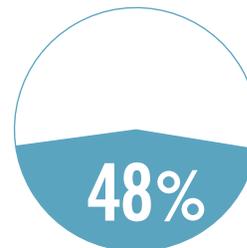


RESIDENTIAL

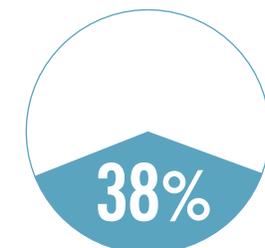


NON-RESIDENTIAL

### CUSTOMER AWARENESS IN 2008



RESIDENTIAL



NON-RESIDENTIAL

# Marketing

3



## EVENT ATTENDANCE

APS employees and representatives participated in more than 150 events across Arizona including home shows, consumer events (concerts, sporting events), trade shows, green programs and retail promotions.

4



## DIRECT MAIL

APS took part in a strategic direct mail campaign designed to test creative text and messaging approaches. This included follow-up mail and e-mail. Altogether, approximately 200,000 customers received marketing materials.

## Key Research and Development Helps Drive Renewable Future

In 2009, APS conducted multiple studies, all with the goal of bringing customers more renewable energy with increased reliability at lower costs.

### WHAT APS LEARNED/WILL LEARN FROM 2009

- APS continued the study of thermocline (the relationship of fluid depth and temperature) and thermal mass energy storage (the ability of a material to absorb, store and release heat) technologies.
- APS began looking into the viability of compressed air as a means to store energy.
- A study conducted by R.W. Beck found that APS may gain the most value from distributed resources when they are located within high penetration scenarios.
- Using data collected from 100 residential customers with photovoltaic solar on their homes, APS found that the typical residential solar installation produces 1,694 KWh/KW annually.
- APS began a research project to assess geothermal resources available in Arizona.
- A study continues on the feasibility, cost and impact to the grid from large-scale adoption of plug-in vehicles.

# REST<sup>1</sup> Budget

TOTAL BUDGET  
**\$78,400,000**



<sup>1</sup> Renewable Energy Standard Tariff

# THE RENEWABLES™



