

SRP's Sustainability Initiatives and Programs

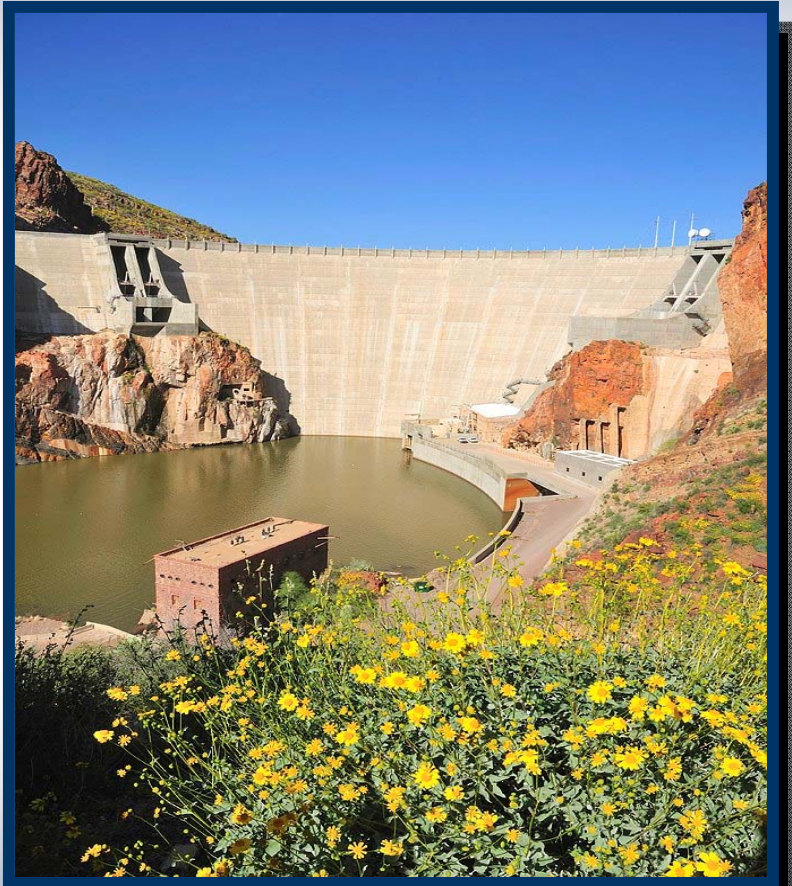
Chico Hunter

*Sr. Engineer, Renewable Energy
and Technologies*

February 26, 2010



Who is SRP?



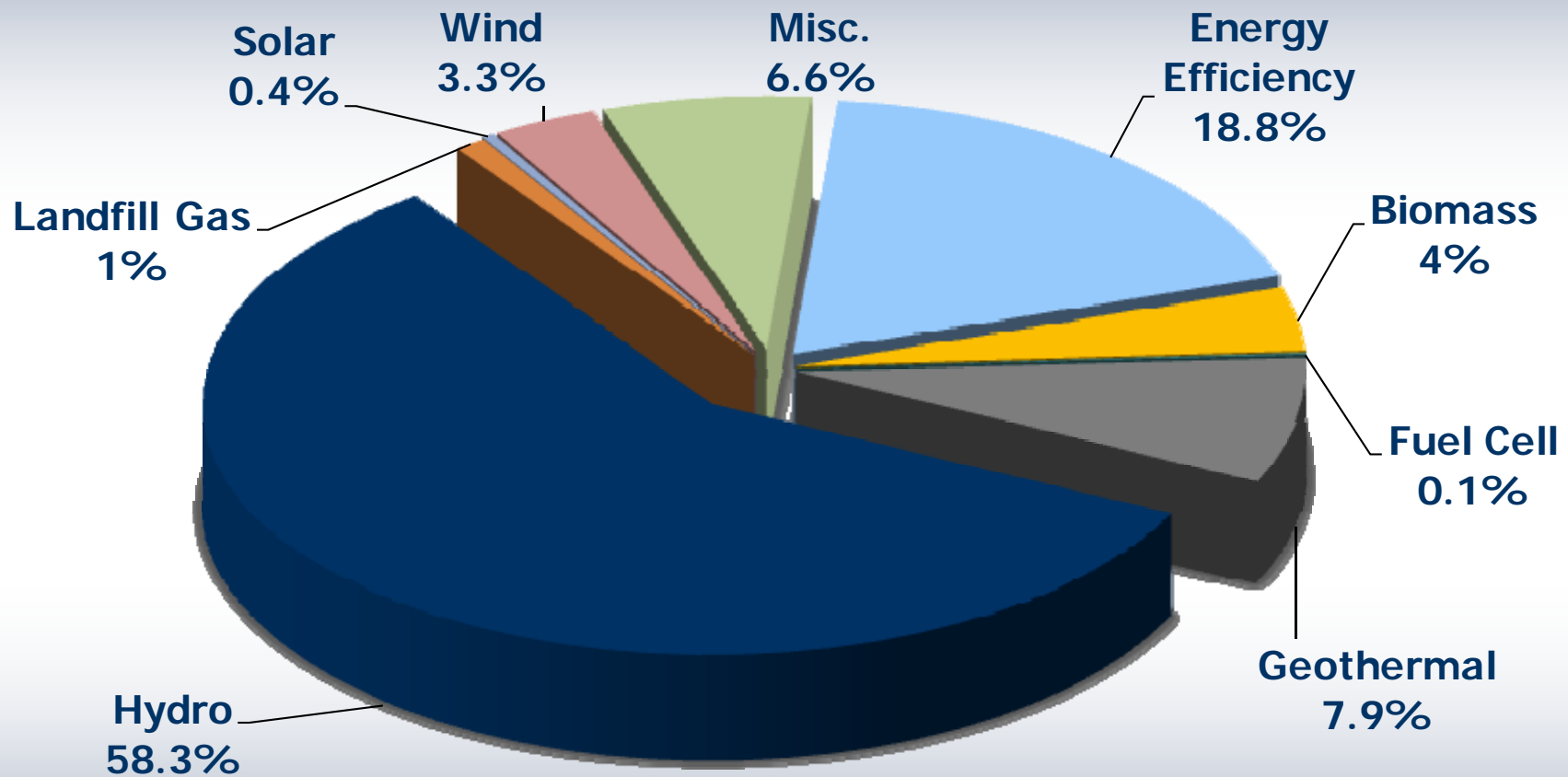
- Established in 1903
- 105 year steward of the environment
- Largest water supplier to Valley
- Third largest public power utility in the Nation
- 935,000 electric customers
- 250 MW new generation needed annually

Sustainable Portfolio Overview



- Established by SRP Board
- 2001 – Allocated \$29 million; 4 year renewable program
- 2004 – Established sustainable portfolio (includes: renewables and energy efficiency measures) with target of 2% of retail sales by 2010
- 2006 – Adopted new target of 15% of retail sales by 2025

Sustainable Portfolio Mix Fiscal Year '09



Total 6.5% of Retail Sales

Topics

- **Renewable Energy Showcase**
- **EarthWise™ Solar Incentive Program**
- **EarthWise™ Customer Programs**



Renewable Energy Showcase



Low Head Hydro



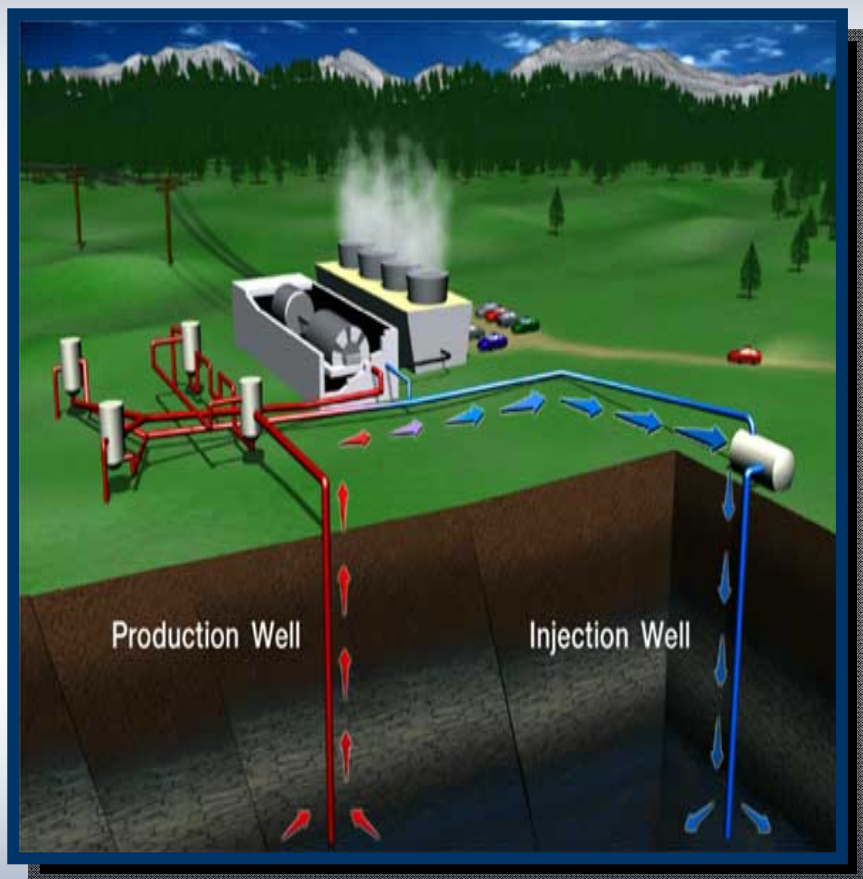
- **Arizona Falls – Arizona Canal at 56th Street & Indian School – 750 kW**
- **South Con – Located between the Grand & Arizona Canals – 1,400 kW**
- **Crosscut Canal on north side of Salt River – 3,000 kW**

SRP Tri-Cities Landfill Gas Plant



- Collaboration with Salt River Pima-Maricopa Indian Community
- Plant size – 4 MW facility produces enough clean energy to power 2,000 homes
- Uses methane gas to fuel five internal combustion engines
- Reduces odors, air pollution and safety hazards
- Pipeline to Salt River Landfill built in February 2008

Geothermal Energy Purchase



- Energy produced from naturally-occurring geothermal steam
- Hudson Ranch, California:
 - 50 MW purchase
 - 30 year agreement beginning 2012
- Lightning Dock, California:
 - 15 MW purchase
 - 20 year agreement beginning 2011

Biomass Energy Purchase



- 10 MW biomass purchase from Snowflake White Mountain Power (20 MW plant)
- APS / SRP share output
- 80% of fuel for plant from forest thinnings
- Operational since Spring 2008

Dry Lake Wind Power Project

- **Dry Lake Wind Power Project near Snowflake, Arizona**
- **First Arizona commercial-scale wind farm**
- **Completed Fall 2009**
- **Meets annual electrical needs of 15,000 Arizona homes**
- **30 turbines each 396 feet high (taller than length of a football field)**



Dry Lake Wind Power Project



Tessera Solar / Stirling Energy Systems

- Tessera Solar, exclusively responsible for the worldwide deployment of the SunCatcher™ Solar Dish
- Stirling Energy Systems, Phoenix-based company, formed in 1996, manufacturer of SunCatcher™ Solar Dish



Maricopa Solar Plant

Tessera Solar / Stirling Energy Systems

- **1.5 MW Demonstration Plant (Maricopa Solar) consists of 60 SunCatcher™ Solar Dishes**
 - **38 ft tall, 40 ft wide, 25 kW, 82 mirrors**
 - **Dish concentrator tracks, collects and focuses the sun's rays to produce heat**
 - **Stirling Engine converts thermal energy to electricity**



Maricopa Solar Plant

Maricopa Solar Plant



SRP Solar Plants

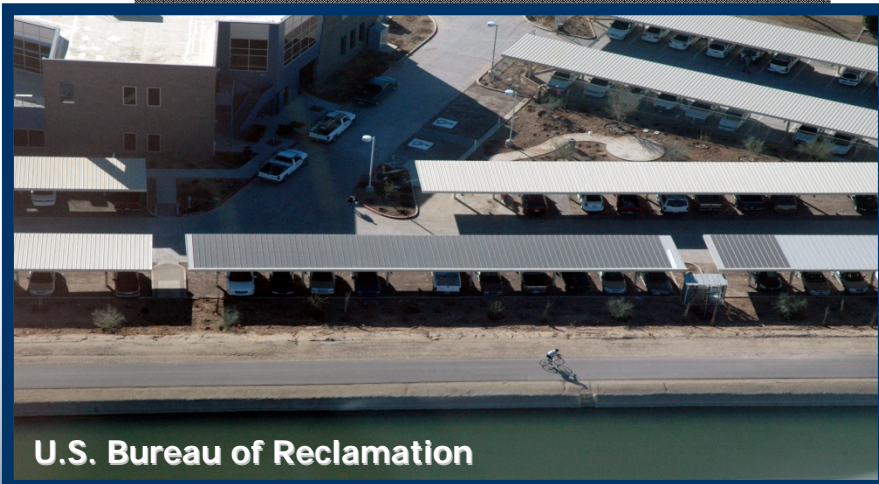


Agua Fria Generating Station, Glendale
200 kW



Rogers Substation, Mesa
400 kW

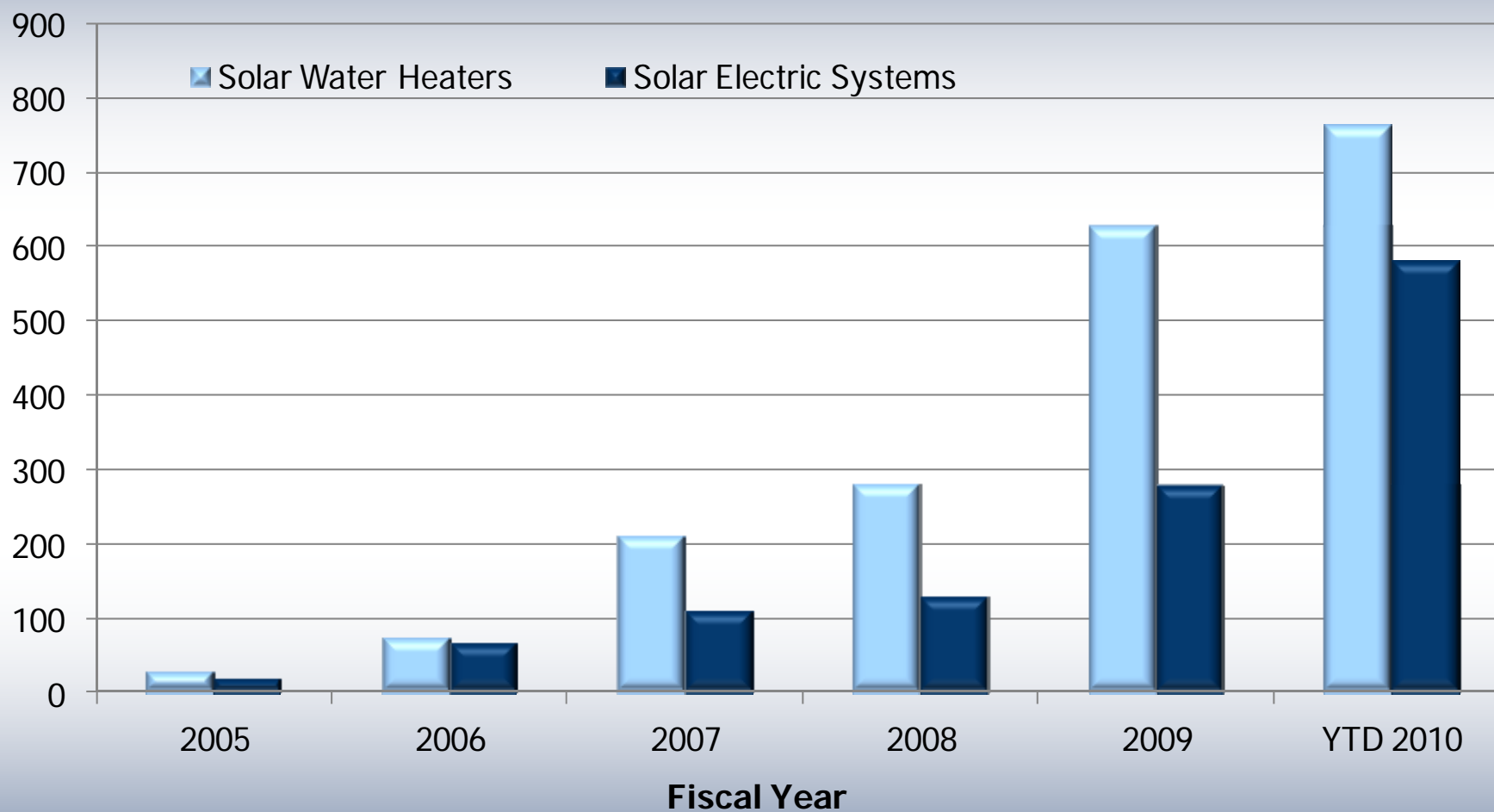
City Partnerships



EarthWise™ Solar Incentive Program



Program Growth



Residential Solar Incentives



- **Solar electric**
 - \$2.70 per watt, 5 kW or less
 - Incentive provided to customer in exchange for green tags / credits
 - 1,061 systems installed
 - 490 systems pending
- **Solar water heating**
 - \$0.50 per kWh energy savings rating
 - 1,931 systems installed
 - 498 systems pending

Commercial Solar Energy Program

- **Solar electric**
 - \$2.25 per watt up-front incentive up to 50 kW
 - \$0.16 per kWh for 20 years or \$0.214 per kWh for 10 years up to 300 kW
 - 33 systems installed / 86 systems pending
- **Solar water heating**
 - \$0.50 per kWh up-front incentive up to \$100,000
 - \$0.08 per kWh incentive for 20 years over \$100,000
 - 5 systems installed / 4 systems pending
- **Solar pool heating**
 - \$0.25 per kWh up-front incentive up to \$100,000

Small Commercial Customer Systems



Optima
– 8 kW system



Body Sculpting Center
– 29 kW system



Integrity Building Corp.
– 19 kW system



CDC Pools
– 9.2 kW system

Gatorade



- Located on Gatorade / PepsiCo Distribution Center in Tolleson
- Solar electric on distribution center:
 - 500 kW system contains 2,448 solar panels. Spans 68,000 sq ft
 - Estimated CO₂ reductions of approximately 400 metric tons per year
- Solar water heating for manufacturing:
 - Uses sun's light to heat water used in manufacturing process for Gatorade products
 - Estimated CO₂ reductions of approximately 370 metric tons per year

EarthWise™ Customer Programs



EarthWise™ Energy

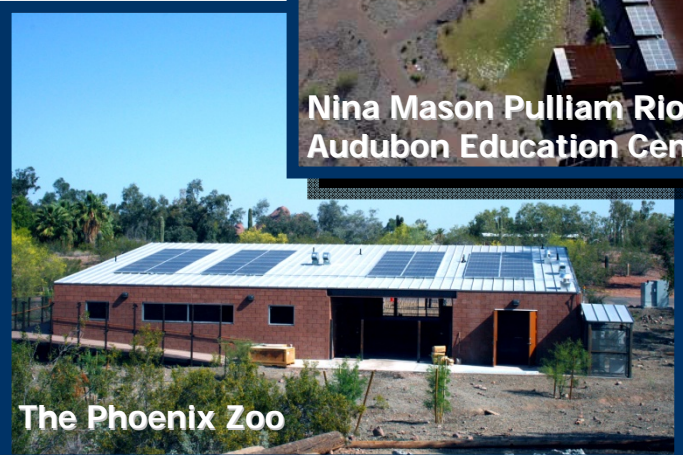
Desert Botanical Gardens



Nina Mason Pulliam Rio Salado
Audubon Education Center



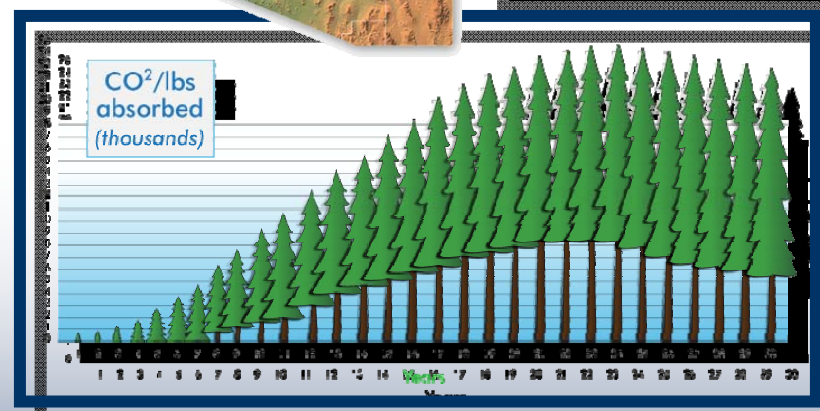
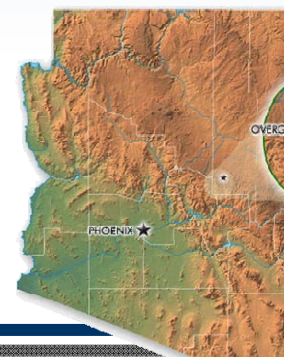
The Phoenix Zoo



- EarthWise Energy™ allows customers to fund solar energy projects in the community
 - \$3 per month
 - 5,167 residential customers
 - 80 business customers
- New projects:
 - Liberty Wildlife
 - Sunshine Acres Children's Home

Trees for Change

- Trees for Change allows customers to fund tree planting projects in Arizona forests
- \$3 per month and SRP provides matching funds
- 1,739 residential and commercial customers
- 65,000 ponderosa pine seedlings planted on 350 acres near Overgaard and Lakeside, areas destroyed in 2002 Rodeo-Chediski Fire
- 65,570 ponderosa pine seedlings planted on 219 acres through Fire Restoration Project, North Kaibab Ranger District, Kaibab NF, areas destroyed in 2006 Warm Fire
- A mature ponderosa pine tree can capture up to 25 lbs of CO₂ annually



Source: American Public Power Company (APPA) Tree Calculator

Solar for Schools

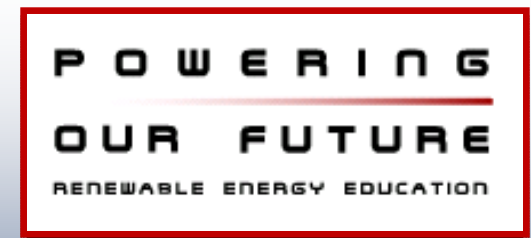
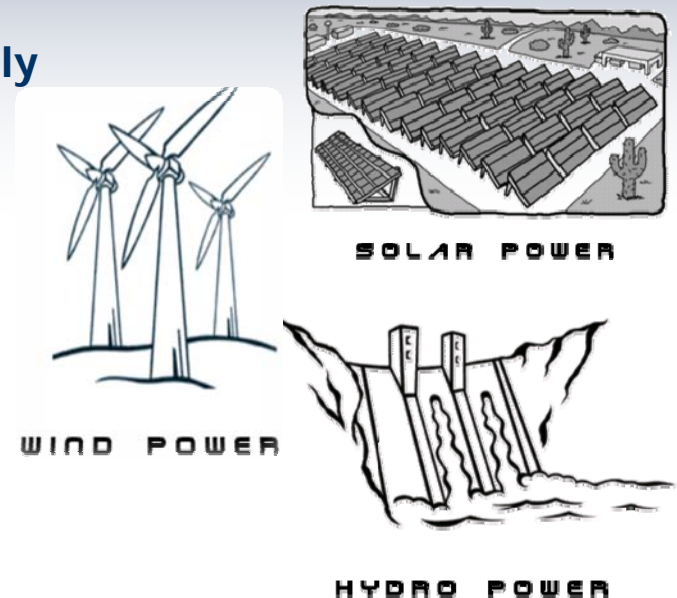


- Grant program to complete installation and ten year maintenance of solar PV systems on Valley schools
- Educational materials and educator training related to solar energy
- Allows students to monitor energy output and use data for “real-world” math learning and application
- 12 schools in Phoenix Metro and 2 schools in Northern Arizona have been awarded 10 kW systems
- Projects to be completed by the end of 2010


Powering Our Future

- Renewable energy curriculum
- Provide training for over 100 teachers, potentially impacting over 3,000 students
- Targets specific grade ranges:
 - Upper Elementary (eJourney) Grades 4 - 5
 - Computer based learning experience
 - Students learn about different types of renewable energy throughout history
 - Middle School Grades 6 - 8
 - Basic understandings of energy
 - High School Grades 9 - 12
 - Focus on photovoltaic solar energy
 - Hands-on activities

<http://poweringourfuture.com/>



EarthWise™ Renewable Energy Credit (REC) Purchase Program

- \$9.30 / MWh (REC) premium, in addition to regular monthly electricity charge
- Option to offset 100% or a smaller percentage of customer's energy usage
- 15,000 RECs purchased for the next five years (Hopkins Ridge Wind Facility in Dayton, Washington)
- Program is Green-e Energy Certified 
- Apollo Group (University of Phoenix) purchased 46,500 RECs, offsetting 100% of Phoenix campus electricity usage and 27% of national electricity usage
- Other customers include:
 - **Desert Botanical Garden**
 - **Chandler-Gilbert Community College**
 - **365 Main (Sony Pictures)**
 - **Metal Magic**
 - **Schnepf Farms**

In Conclusion

- **SRP and the utility industry, face many challenges related to growth, climate change, and balancing costs for our customers as we strive to provide a sustainable energy supply**
- **SRP has a long and rich history of contributing to the development of the greater Phoenix area through careful management of precious natural resources**
- **Providing a sustainable energy source for the Valley is critical**
- **SRP is committed to incorporating renewables and energy efficiency into our resource mix at the lowest cost to our customers**