



Arizona Public Service

Arizona Environmental Strategic Alliance Report

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About APS

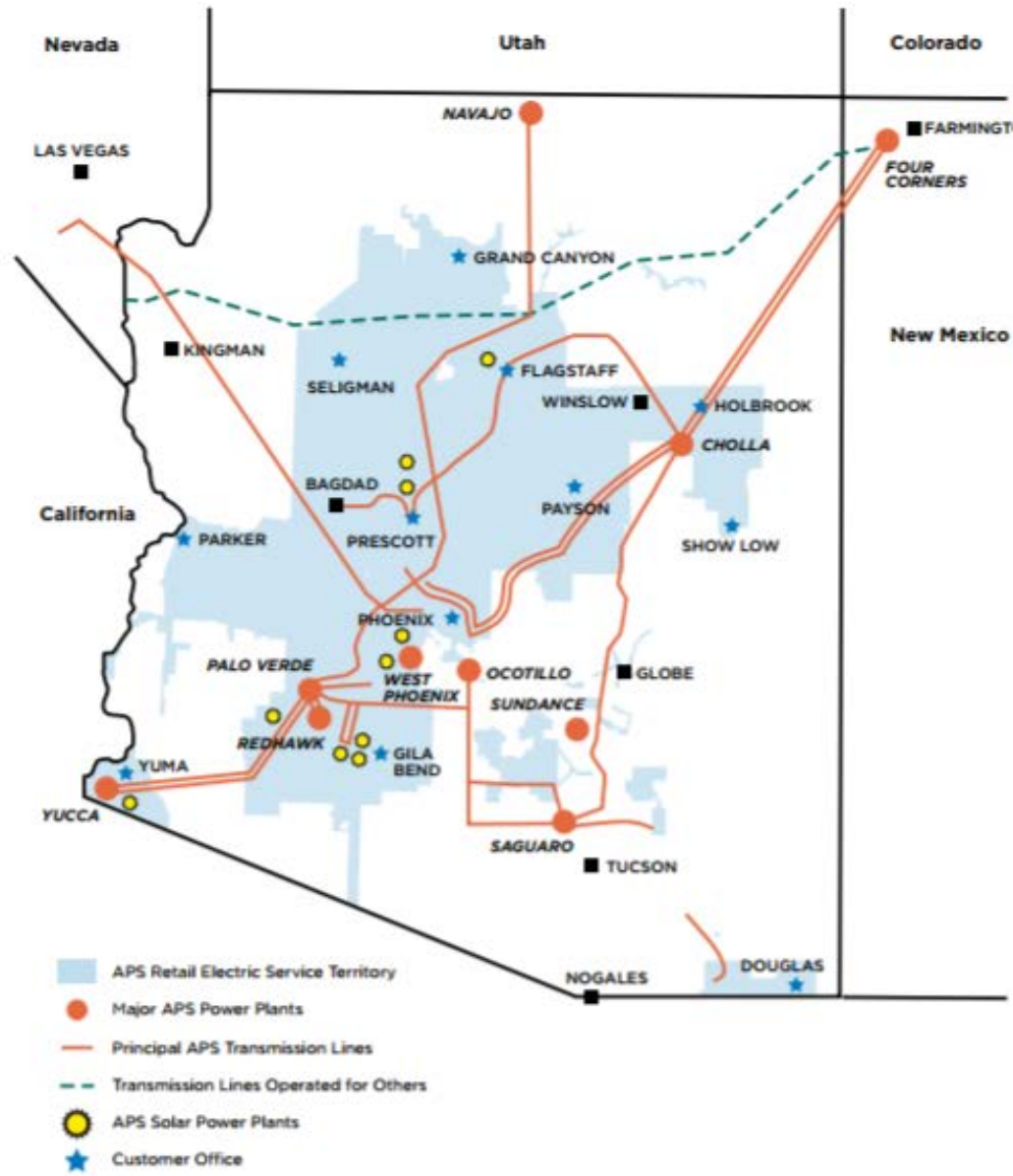
- Providing power to Arizonians for over 130 years.
- Providing power in 11 of the 15 counties in Arizona.
- 1.2 million customers
- APS donated more than \$10M in 2016 and APS employees pledged more than \$2.5M to community services
- Listed on *Forbes* 2016 List of America's Best Employers
- 20% of workforce is military veterans

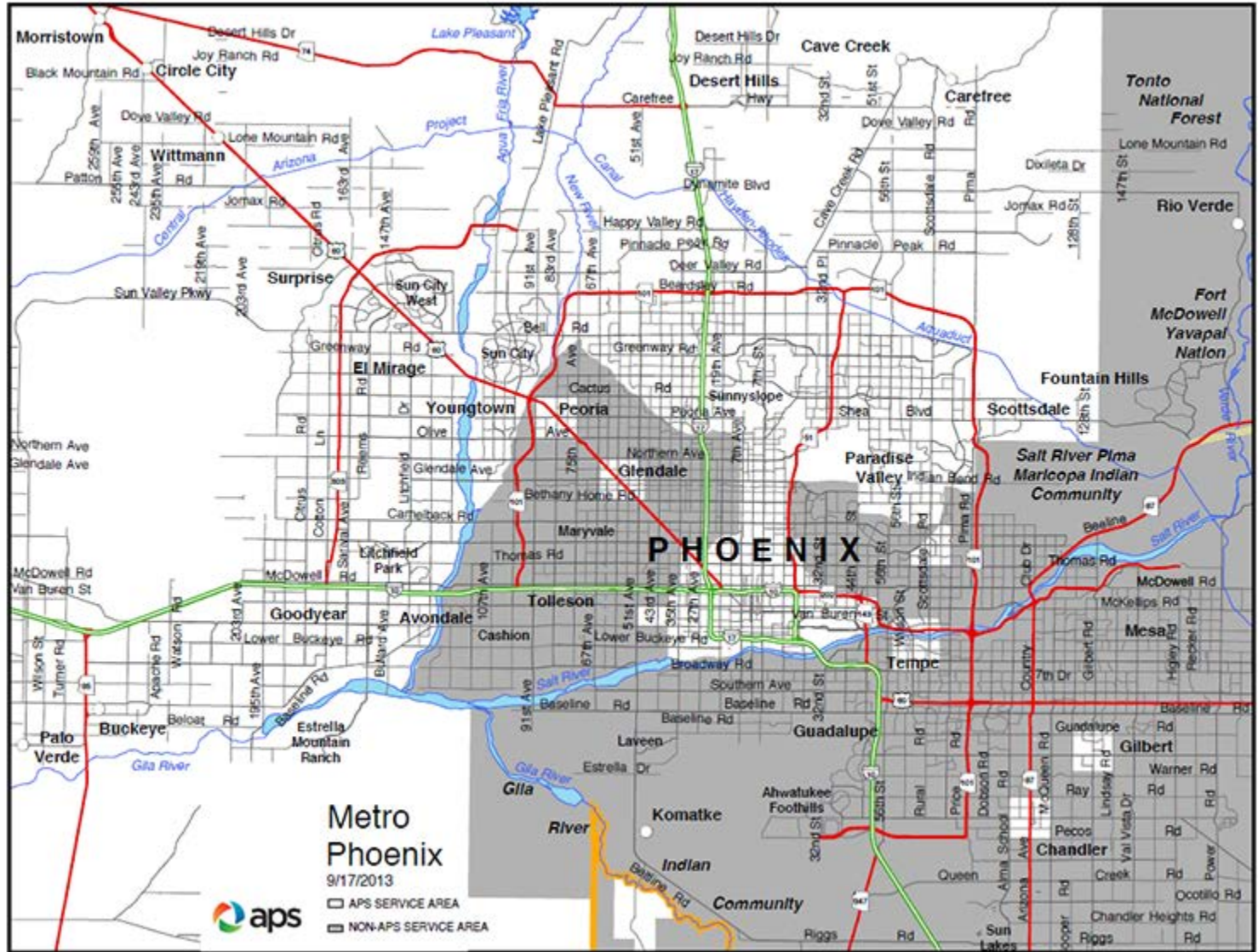


Facts About APS

- In 2016, we worked with partners to create an estimated 5,000 new jobs and drive more than \$1 billion in capital investment in APS service territory.
- 34,646 Square Miles of Service Territory
- 35,267 miles of transmission and distribution wires (24,900 miles around earth)
- \$3.5 billion in annual revenues

APS SERVICE TERRITORY MAP

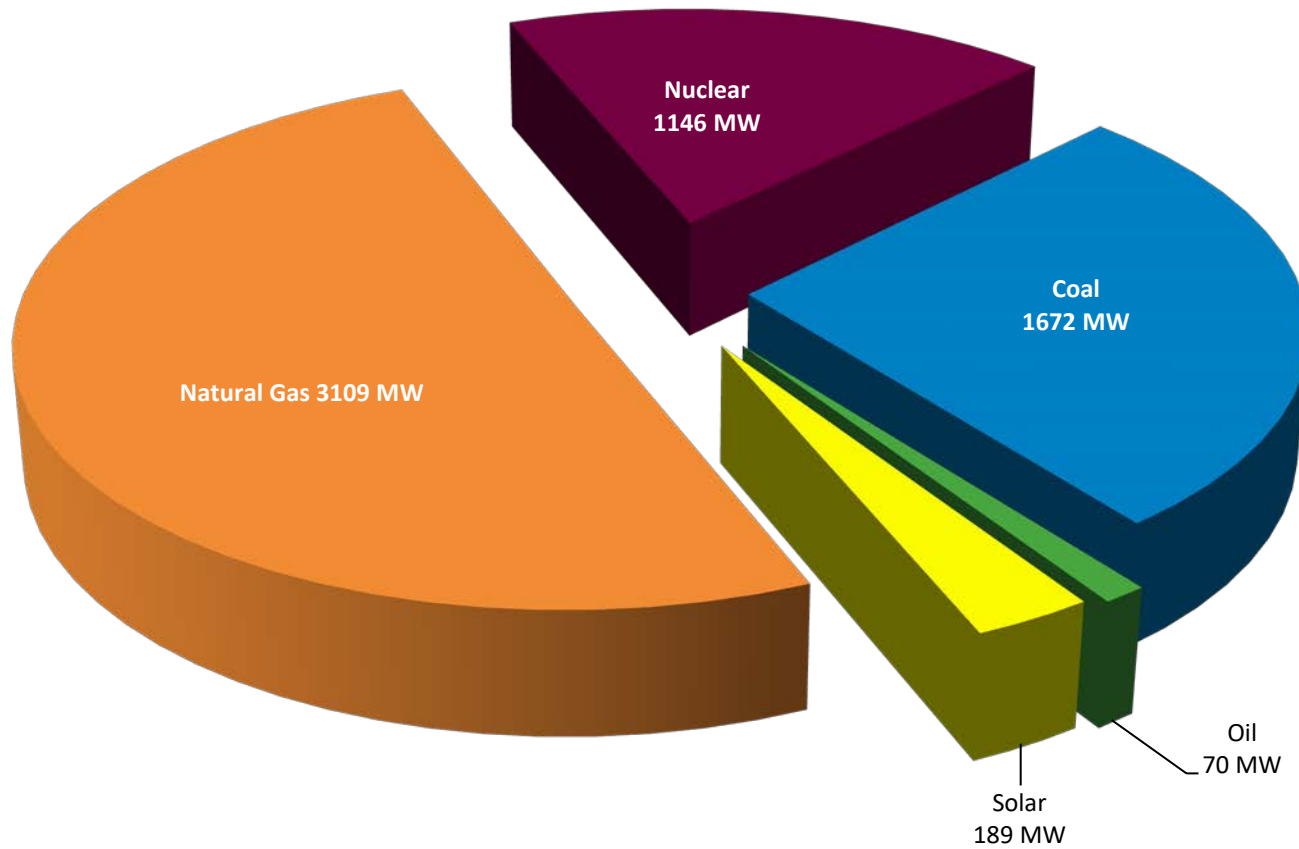




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APS Owned Generation Capacity

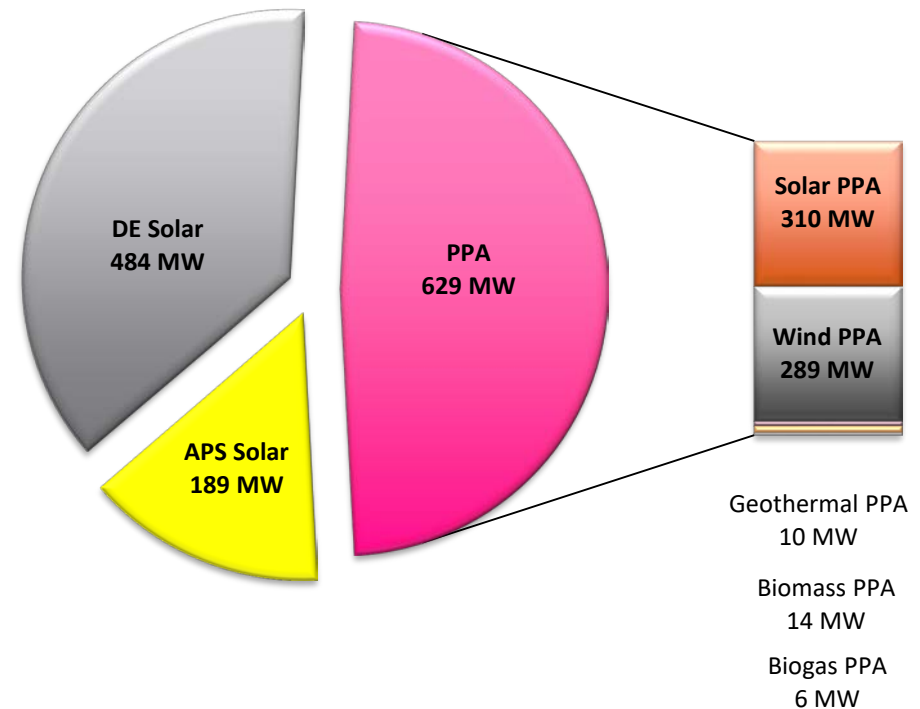


Renewable Generation Assets



Arizona Sun Facilities

- Total portfolio 1,302 MW AC
- 88 MW planned/under development



Current Generation Assets

Coal

Four Corners 1440 mw

5 Units. Units 1,2 and 3 were shut down in 2013

2 Units – Both 770 MW capacity

APS owns 63% of both units 4-5

Cholla Power Plant

4 Units. Unit 2 was shut down in 2015

Unit 1-116 MW, Unit 3-271, Unit 4-380MW

APS owns 100% of both units 1 & 3

Navajo Generating Station

3 Units. Plant set for closure 2019?

All three 750 MW each

APS owns 14% of each unit



Gas

Yucca – 243 MW

Douglas – 16 MW

Saguaro – 189 MW

Ocotillo – 330 (soon to be 500 MW)

West Phoenix – 997 MW

RedHawk – 984 MW

Sundance – 420 MW



Nuclear

3 Units

#1 - 1311 MW

#2 - 1314 MW

#3 - 1312 MW

APS is the largest owner (29.1%) and site operator.

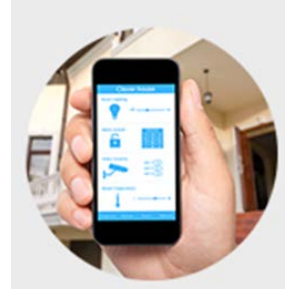
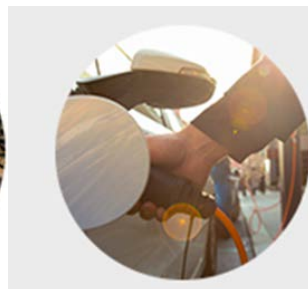
Palo Verde Nuclear Generating Station



**Palo Verde is largest source of electrical energy in the United States
Produces 80% of Arizona's carbon free electricity
32.2 Million MWh of carbon free energy produced in 2016
13.2 million metric tons of GHG emissions avoided**

Sustainability at APS

- **APS Vision:** Creating a sustainable energy future for Arizona.
- “Working to meet our business needs each day while implementing business practices that support a vibrant economy, a healthy environment and strong communities for future generations.”



Arizona Strategic Environmental Alliance – Leadership Characteristics

- 1) Conservation and Pollution Prevention
- 2) Education and Mentoring
- 3) Organizational environmental Policies
- 4) Other Topics to Report

Conservation and Pollution Prevention Programs To Reduce Water Consumption

- Reclaimed water accounted for more than two-thirds of the water used in our generating facilities in 2016
- We spend \$500,000 per year to protect endangered fish species
- Over the next 10 years, our goal is to reduce water intensity company-wide by 20 percent compared to a 2014 baseline.



Conservation and Pollution Prevention Programs To Reduce Regulated Discharges to the Environment

- Lowered our carbon emissions by 26%
- Palo Verde's energy generation accounted for nearly 80 percent of all carbon-free generation in Arizona
- Through combined actions we avoided 4.9 million metric tons of carbon – equivalent to taking 1 million cars off the road



Conservation and Pollution Prevention

Programs To Reduce Energy Consumption

- APS has been named EPA Energy Star Partner of the Year and Sustained Excellence award winner for excellence in energy efficiency program delivery every year since 2005.
 - APS has been recognized for exemplary energy efficiency programs and achievements in energy savings by the American Council for an Energy Efficient Economy and Ceres.
- 1) Active energy efficiency programs – home/commercial
 - 2) In 2016 \$60 million budget – 550,000 MW hours saved.
 - 3) On track for 22% of retail elect sales by 2020. Ahead of goal.



Education and Mentoring

Providing to the Public an Annual Report

Documenting Environmental Performance

1) Carbon Disclosure Project

- Voluntary submittal of carbon emissions and water management efforts.
- In 2014 we received a score of C, in 2015 we received a score of B and for 2016 we received a score of A
- Received a CDP score of “Management”
 - 1 of only 2 utilities to receive leadership in water and climate together.



Education and Mentoring

Providing to the Public an Annual Report

Documenting Environmental Performance

2) Corporate Responsibility Report

- **Purpose:** demonstrate how APS is being a good corporate citizen through the company's commitment to environmental stewardship, community investment, shareholder value.
- **Focus Areas:**
 - Carbon Management
 - Water Resources
 - People
 - Safety & Security
 - Energy Innovation
- Sustainability sections added to our Proxy and 2017 IRP to improve transparency.
- List as a Top 100 Corporate Citizen by the Corporate Responsibility Magazine.



Education and Mentoring

Membership in voluntary compliance program

Member of the Arizona Voluntary Environmental Stewardship Program (VESP).

- Ocotillo Power Plant – Platinum
- West Phoenix Power Plant – Platinum
- Redhawk Power Plant - Platinum
- Yucca Power Plant (Platinum 12/17)



Education and Mentoring

Participation in any program enhancing goal of improving relationship to the environment.

Member of the San Juan Basin Recovery Implementation Program SJBRIIP

- Established to recover the Colorado Pike minnow and razorback sucker while allowing water development and management activities to continue in the San Juan River Basin.



Organizational Environmental Policies

Evaluation of the environmental impacts of product life cycle.

Recycling and disposal of solar panels

- An estimated 500,000 solar panels were installed globally every day in 2015.
- Generally, solar panels are expected to last 20-30 years. However, panels break, die, lose voltage or get damaged.
- Disposal/Recycling solar panels is a relatively complex task because they contain many different types of materials. Panels contain metals, such as lead, copper, gallium and cadmium; an aluminum frame; silicon solar cells; and synthetic material that encapsulates the silicon. The various materials need to be separated to be properly recycled.
- At the moment, most countries do not have a robust recycling infrastructure in place for solar panels
- APS has taken an industry leading position on setting policy for how to properly dispose of or recycle damaged, defective or outdated solar panels.



Organizational Environmental Policies

Implementation of sustainability practices

Sustainability



Carbon Management



Energy Innovation



Safety & Security



Water Resources



People

Sustainability Team

Pat Dinkel, CSO | Chas Spell, Director

Charlene Saltz, Consultant | Jeffrey Jennings, Project Coordinator



Employees

Sustainability Week



Yearly event to educate employees of APS's sustainability initiatives

The APS "Green Team"



Employees working together to share their interests and ideas in creating a sustainable work place

Stakeholders

Investor ESG Reporting



Completion of reporting, validation, and benchmarking of sustainability activity

Corporate Responsibility Report



A yearly PNW report that focuses on sustainability actions of APS

Governance & Strategy

Sustainability Strategy



Determine priorities for advancing sustainability at APS

Sustainability Working Group



A group of representatives from BUs that input and update on sustainability actions in their BU

Organizational Environmental Policies

An environmental management system and audit program

Fleet-wide EMS system

All our power plants have established, documented, implemented and maintain an Environmental Management System in accordance with the ISO 14001:2015 and work to continually improve effectiveness. The EMS is fully integrated with each Generation Station's operations to comply with all laws, regulations and other applicable requirements concerning the environment. Procedures exist that identify the environmental impacts of activities, products and services, including emissions to air, releases to water and land, use of raw materials and natural resources.

ISO Audit Program

- Voluntary ISO certification for all power plants. Starting in 2016 ISO audit certification was extended to all service centers.
- ISO 14001: Environmental Management Systems-Specifications with Guidance for Use Standard, ISO 14001, adopted by the International Organization for Standardization (ISO) in 2004, and amended in 2015.
- APS has established, documented, implemented and maintains an Environmental Management System in accordance with the ISO 14001:2015 and works to continually improve its effectiveness.

Other Topics to Report

Other innovation or environmental leadership activities not covered earlier that support the Alliance principles

GHG Benchmarking

Working with EPRI Electric Power Research Institute as part of their Sustainability Benchmarking.



Arizona Forward Member

APS rep on Board of Directors



Center for Climate and Energy Solutions (C2ES)

APS is an active member of the BELC Business Environmental Leadership Council



Other Topics to Report

Other innovation or environmental leadership activities not covered earlier that support the Alliance principles

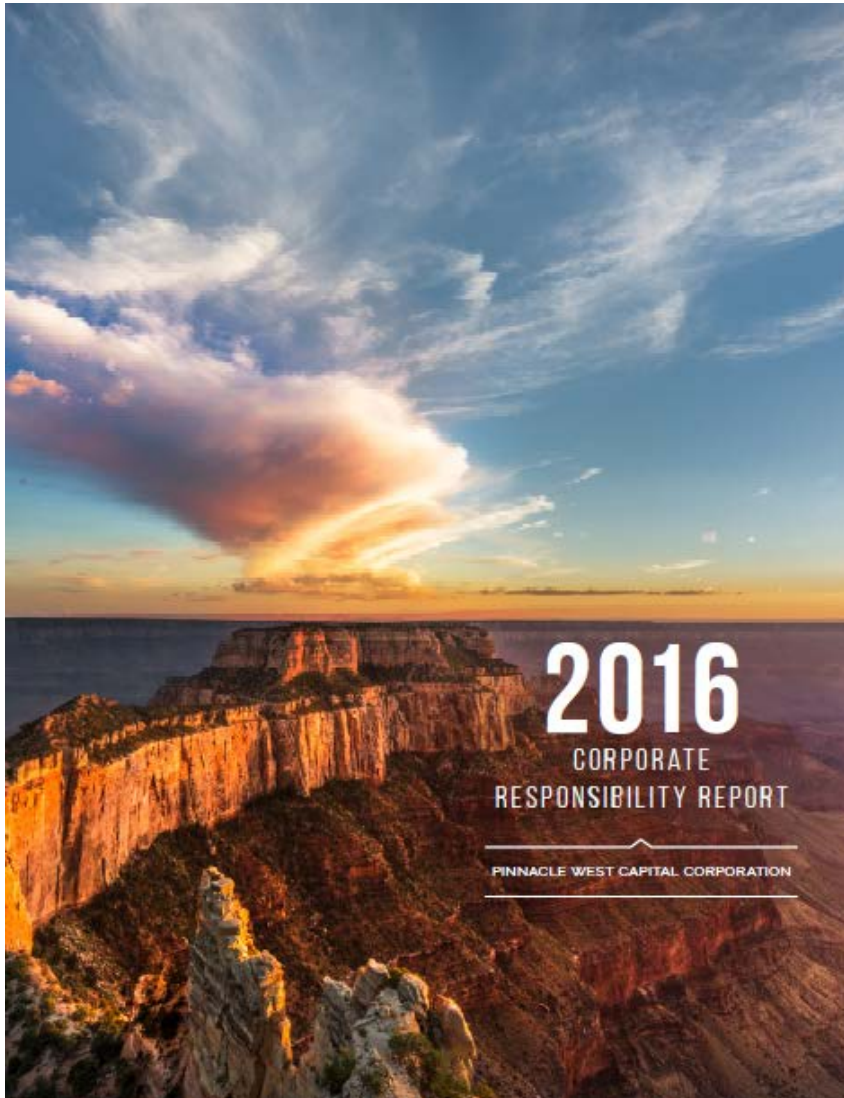
Energy Innovation

- Solar Innovation Study
- The solar innovation study was designed to test how rooftop panels could be used to extend the daylight hours and to use the panels for energy management, voltage and frequency stabilization and peak demand.
- EIM - saved almost \$6M in the first three months
- Advanced metering and distribution management systems
- Breaking ground on the Punkin Center battery Storage system. Systems are designed to be more efficient than rebuilding T&D line. Two 4 MW att hour batteries . Up and running early next year

1 MILLION
FIELD ORDERS
AVOIDED
WITH ADVANCED METERS

\$20
MILLION SAVED
FROM ADVANCED METERS

TEN MW SOLAR
10₂
TWO 2-MWH BATTERIES
IN SOLAR PARTNER PROGRAM



Arizona Public Service

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