

## APS: Pursuing a cleaner energy future for Arizona

At APS, we are setting the course for a sustainable energy future that brings together cleaner energy resources, advanced technologies, customer choice and reliability for our customers.

We are developing new clean energy initiatives that will deliver more “solar after sunset” to customers, when they need it most. Through our industry-leading research projects, we are finding ways to integrate solar energy more efficiently while maintaining reliability. Our updated service plans support customers’ choice to adopt technologies like private (rooftop) solar, batteries and electric vehicles.

Working together, we can deploy clean energy resources responsibly, without compromising affordability, reliability or Arizona’s growing economy.

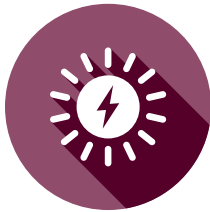
### DEVELOPING CLEANER ENERGY RESOURCES

Our energy mix will become increasingly cleaner, even with anticipated population growth and greater economic activity in Arizona. Growing renewable energy resources, energy storage, energy efficiency, advanced technologies and the nation’s largest source of carbon-free energy, Palo Verde Generating Station, are the largest contributors to the mix.

- Today, **50% of our energy mix comes from carbon-free resources**—renewables, energy efficiency and nuclear.
- Our energy mix includes more than **1.7 gigawatts of renewable energy capacity**.
- We are adding **850 megawatts of energy storage by 2025**. Energy storage increases flexibility by soaking up excess solar energy produced during midday and delivering it to customers later in the day when they need it most.
- The award-winning **APS Solar Partner Program and APS Solar Communities** are increasing access to rooftop solar for customers, including limited- and moderate-income customers.
- **Palo Verde generates nearly 70% of Arizona’s carbon-free energy**. The plant generated 31.1 million megawatt-hours of energy in 2018, more than any other plant in the United States.
- **Next-generation energy efficiency programs** will work hand-in-hand with our updated service plans to help customers use power when energy is abundant during midday hours and conserve it in the late afternoon and early evening, when power is in peak demand and most expensive.
- Our clean-energy initiatives are projected to **reduce our carbon intensity by 23%** in the next 15 years.

### LEADERSHIP IN SOLAR ENERGY

**60**  **YEARS**  
as a leader in solar research  
and development

**1,400**  **MEGAWATTS**  
enough to power about  
350,000 households

## BUILDING THE GRID OF THE FUTURE

We are at the forefront of developing cost-effective innovations with technologies like solar, energy storage and microgrids to add flexibility and enhance reliability for customers.

- **Homegrown solar alliance:** We are joining with another Arizona leader in renewable energy, First Solar, for a solar-plus-storage plant that will use a 50-megawatt battery to capture and deliver clean energy to customers during peak hours on hot summer days.
- **Solar Partner Program battery systems:** We have deployed two large-scale batteries in metro Phoenix neighborhoods with high levels of private solar. The study is evaluating how best to capture the full benefits of solar while ensuring reliable service for customers.
- **Punkin Center battery system:** We took a new approach to ensure reliability in this growing rural area, choosing two large-scale batteries over a traditional rebuild with poles and wires.
- **Solar Innovation Study:** We are discovering how residential customers can use solar panels, battery storage, smart thermostats and other advanced technology to manage their energy use and save on their bills.
- **Microgrids:** Projects in Phoenix and Yuma provide needed backup power to customers who demand the highest level of reliability while also supplying power to additional APS customers during peak demand times.
- **Advanced grid control:** We recently deployed a new energy management system that helps operators react more quickly to outages and more efficiently integrate solar energy resources and other advanced technologies onto the grid.

## OUR CLEAN ENERGY INITIATIVES

### New Battery Systems for Existing APS Solar Plants

NAME	LOCATION	CAPACITY	PARTNER	IN-SERVICE DATE
<ul style="list-style-type: none"><li>• Desert Star</li><li>• Gila Bend</li><li>• Hyder</li><li>• Paloma/Cotton Center (adjacent plants that charge single battery system)</li><li>• Foothills</li></ul>	Maricopa County     Yuma County	141 MW/423 MWh	Invenergy	Mid-2020
<ul style="list-style-type: none"><li>• Red Rock</li><li>• Chino Valley</li></ul>	Pinal County Yavapai County	59 MW/177 MWh	TBD (current RFP)	June 2021

### Stand-Alone Battery Systems to Deliver Clean Energy at Peak Use Times

NAME	LOCATION	CAPACITY	PARTNER	IN-SERVICE DATE
<ul style="list-style-type: none"><li>• Westwing Substation</li></ul>	Sun City	100 MW/400 MWh	AES	June 2021
<ul style="list-style-type: none"><li>• El Sol Energy Center</li></ul>	Youngtown	50 MW/200 MWh	Invenergy	June 2021

### Future Clean Energy Projects

NAME	LOCATION	CAPACITY	PARTNER	IN-SERVICE DATE
<ul style="list-style-type: none"><li>• First Solar</li></ul>	Maricopa County	65 MW solar + 50 MW/135 MWh storage	First Solar	2021
<ul style="list-style-type: none"><li>• Redhawk Solar</li></ul>	Maricopa County	100 MW solar + 100 MW/300 MWh storage	TBD (current RFP)	June 2021
<ul style="list-style-type: none"><li>• Solar plants with storage</li></ul>	TBD	250 MW solar + 250 MW/750 MWh storage	TBD	By 2025
<ul style="list-style-type: none"><li>• Stand-alone batteries</li></ul>	TBD	150 MW/600 MWh	TBD	