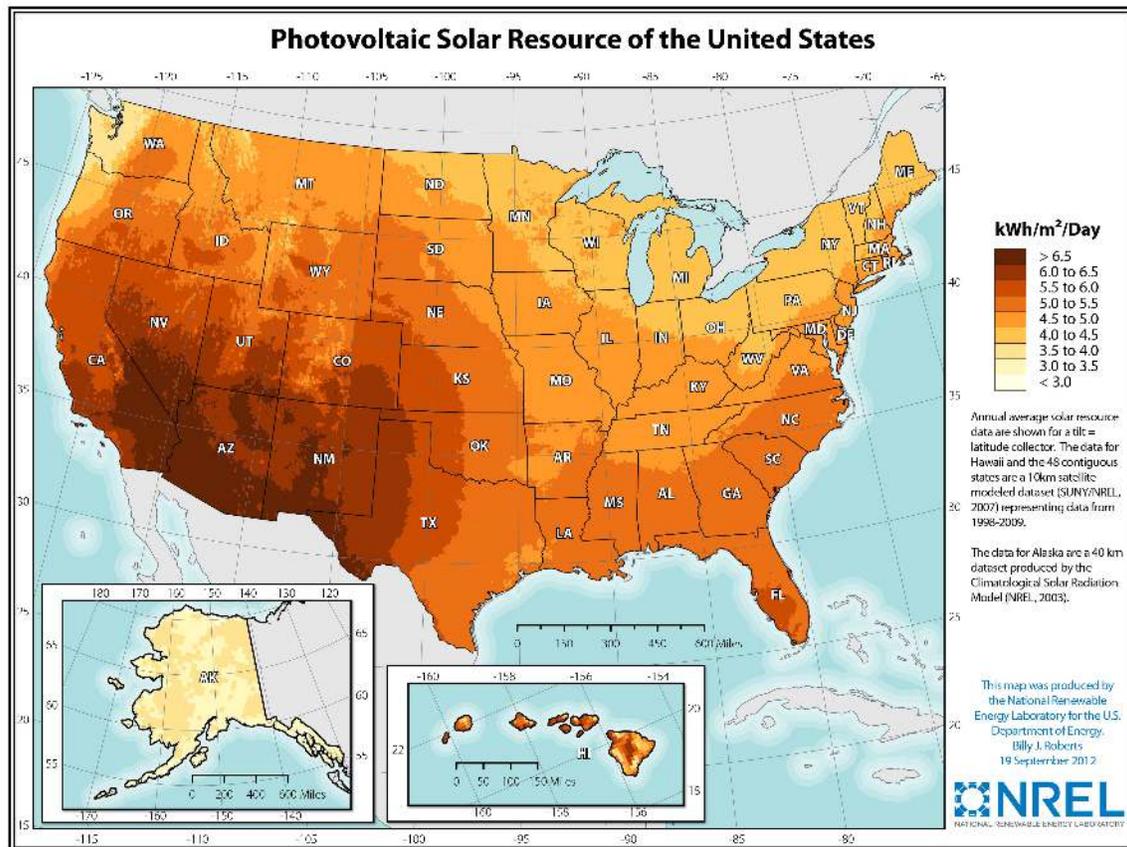


Arizona Public Service

Arizona Public Service Company is the largest electric utility in Arizona and the subsidiary of publicly-traded S&P 500 member Pinnacle West Capital Corporation. The utility provides power for nearly 1.2 million customers in 11 of the state's 15 counties.

Despite the fact that Arizona is the sunniest state in the U.S., it is falling far behind on solar installations, and by the end of 2015, the state had fallen from second in total U.S. installed solar to sixth.



In fact, New Jersey, a state with far less solar energy resource potential, has more small-scale distributed rooftop solar than Arizona. There are 793 megawatts of solar installed in New Jersey compared to 609 megawatts in Arizona.

Why would the sunniest state in the U.S. have so little solar, when [solar power purchase agreements](#) have been signed in the Southwestern U.S. for 4 to 6 cents/kWh?

Why, then, is Arizona less than 4% solar and over 40% coal?

One reason is that Arizona utilities make far more money running old, polluting coal plants that generate electricity for around 3 cents/kWh, than risking a loss of sales to solar energy. Although utility-scale solar in Arizona has been as cheap as new natural gas for a number of years, utilities like Arizona Public Service have not lived up to the state's solar potential.

Summary

As is illustrated by its June 2016 request for a \$3.6 billion rate increase over only three years, APS is investing far more money in coal and natural gas than in solar. APS' 2017 Integrated Resource Plan, which outlines its how it will meet electricity demands over the next 15 years, states that its current [26% natural gas will increase to 36% by 2031](#).

APS' 2015 10-k shows that solar accounts for a paltry 1.5% of its owned generation, with 5.1% purchased clean energy (both solar and wind). Thus, APS' total coal, oil and natural gas-fired electricity is 66.6%. After adding in nuclear, the total fossil fueled generation for 2015 accounts for 93.4% of electricity generated. In fact, APS' 2012 purchase of Southern California Edison's share of the Four Corners coal plant - adding 179 megawatts (MW) to APS' owned coal capacity - was a step in the opposite direction from clean energy and for protecting ratepayers, since APS has had to spend over \$400 million for emissions control of these units.

Furthermore, APS, along with the other utilities in the state, consume groundwater at their coal plants. In a state that's increasingly facing climate-change-induced heat waves and drought, regulators have refused to recognize the obvious pollution and carbon emissions from coal plants and the fact that solar PV uses very little water.

APS' Solana Generating Station, near Gila Bend, is a 280 MW Concentrating Solar Power (CSP) power plant that includes storage, providing up to 6 hours of electricity after the sun sets by using molten salt to store heat, which then turns a steam turbine. Although this plant was 'expensive' at the time it was built at an estimated 14 cents/kWh (which includes a 30% federal Investment Tax Credit),

along with a \$1.45 billion federal loan guarantee, the plant provides electricity at peak use times when it could cost APS 30 to 40 cents/kWh.

There is only one conclusion to be drawn from Arizona's lack of solar, and that is regulatory capture. Arizona is one of only 7 states with regulators that have constitutional power – which means that only the 5-member Corporation Commission makes all water, electric and gas utility decisions – and one of 13 states with an elected Commission, which makes it subject to large campaign contributions.

This is amply illustrated by APS' likely large 'investment' of over \$3 million in a single election cycle, and the ongoing drama of front groups like 60-Plus and others that spend utility money on critical elections and also on public relations during debates over solar's role in the state.

Arizona Electricity Background

[Electric Power Sector Energy Expenditure Estimates, 2013, Arizona:](#)

Coal: \$934 million

Natural Gas: \$1.034 billion

Uranium: \$302.7 million

- Net summer capacity: 28,039 MW
- Palo Verde Nuclear Generating Station (PVNGS), at 3,937 MW, is the largest nuclear power plant in the U.S., and the 2nd largest of any U.S. power plant.
- Twenty-five percent of AZ's electricity is used for air conditioning, four times the national average of 6%.
- [Electricity generation from Hoover Dam \(2,080 MW\) is down 25%](#) since the level of Lake Mead is down to 37% full, the [lowest level since it was first filled in the 1930s](#)
- AZ's Renewable Portfolio Standard, 15% clean energy by 2025, is one of the lowest in the U.S. AZ's RPS is unique in that it includes a 30% set-aside for distributed generation.
- [AZ's Energy Efficiency Standard](#) is one of the highest in the U.S. at 22% by 2020, and applies to all Arizona utilities (except for Salt River Project), with a slightly lower standard for coops
- Although Arizona's Native American lands are some of the richest in the U.S. for solar, geothermal and wind, the [Navajo Nation has the highest percentage of households without electricity](#) among U.S. tribal lands.

How Much Solar Is Installed in Arizona?

- In 2014, [solar contributed less than 4%](#) to Arizona's net electricity generation, while [distributed generation contributed less than 2%](#) at [609 MW per the EIA](#)
- EIA estimates that the total U.S. installed capacity of distributed solar PV (defined as less than 1 MW) in September 2015 is 7,691 MW; AZ's share of total U.S. distributed solar PV is thus ~8% (609 MW/7,691 MW), which is still modest relative to AZ's solar resource.
- EIA reported that in November 2015, while California had nearly 10 GW of solar, Arizona's second place of 2.1 GW of solar is far lower. Arizona is now in [6th place for total installed U.S. solar](#) capacity as of 12/31/15, behind California, North Carolina, Nevada, Massachusetts and New York. GTM/SEIA report in the Q4 2015 Solar Market Insight that while North Carolina installed 1,134 MW of solar, Arizona installed only 234 MW.
- Arizona's 2015 total installed solar capacity of only 234 MW is far behind California's 2015 total installed solar capacity of 3,266 MW.

How Much Clean Energy Does Arizona Public Service Have?

- According to a [Pinnacle West presentation to UBS Utilities and Natural Gas Conference dated March 1, 2016](#), APS has 166 MW of residential rooftop solar and 189 MW of utility-scale solar (see slides 37-38).
- APS has purchased power contracts for the following: 310 MW solar (primarily from 280 MW Solana Concentrating Solar Power plant in Gila Bend), 289 MW wind, 10 MW geothermal, 14 MW biomass, 6 MW biogas, 60 MW non-disclosed "inter-utility" plus 480 MW with PacifiCorp, 25 MW Demand Response and others (see slide 39).

Arizona Public Service Electricity Generation Mix: Current and Future

ENERGY MIX

- Coal: 17%
- Natural Gas: 35%
- Nuclear: 18%
- Energy Efficiency: 15.3%
- Renewable Energy and Distributed Energy: 14.7%

Although APS plans to reduce its coal burn from the current 35% to 17% by 2029, by increasing its natural gas burn from 19% to 35%, it will actually increase its greenhouse gas emissions in the near term, since the global warming potential from methane, which is leaked at multiple points of the

natural gas supply chain, is 86 times that of carbon over 20 years, according to the Intergovernmental Panel on Climate Change's 2013 report. Overall, the [reduction in fossil fueled MWhs is a paltry 2%](#) (54% coal plus gas in 2015; 52% coal plus gas in 2029).

APS Buying Cut-Rate, 'Excess' Solar Generation from California

According to a June 9, 2016 article by Will Stone in Marketplace, APS is [“actually being paid to take” surplus solar energy from California](#). This justifies APS' future plans, which include very little solar, and lots of new natural gas plants. In other words, if APS can purchase dirt-cheap excess solar electrons from California, why build more solar in Arizona?

So while APS is investing \$500 million to double the capacity of the Ocotillo natural gas plant in Tempe, they are minimizing its own solar investment, and working to keep others out of the market via community solar and other policies that would allow third parties to own and generate electricity via utility-scale installations. So-called community solar can be owned by the utility or customers, and since APS isn't planning to build much solar, why not allow others to build and own large-scale solar?

APS Rate Case Filed June 2016 for \$3.6 Billion

In June 2016, APS filed for a [\\$3.6 billion rate increase \(Docket E-01345A-16-0036\)](#) to go into effect July 2017, including higher fixed charges, new demand charges for solar customers, lowering the rate paid for distributed solar from the retail rate (12-13 cents/kWh) to wholesale rate (3 cents/kWh), and spending billions of dollars to introduce fossil fuel plants, including one of the Western U.S.'s oldest and dirtiest coal plants, into rate base. APS also proposes to increase its profits on both energy efficiency and distribution expenditures by allowing APS greater recovery for lost fixed costs.

APS also proposes to transfer to base rates various adjustors totaling \$267.5 million, which likely means that APS will be allowed to collect a ~10% profit on expenses that were previously “passed through” without APS profiting. Since APS' last rate case, it has [reduced its net ownership in fossil fueled generation](#) by only 291 MW, or 5% (291 MW / 6,186 MW total generation [2015 10k]).

An [APS press release](#) from June 1, 2016 says it is requesting \$3.6 billion in upgrades and maintenance for the grid; and then lists \$500M for Ocotillo gas plant refurbishing, plus \$400M for the 1,636 MW Four Corners coal plant, but

rate case testimony by APS general manager of fossil fuel generation John Lucas states that APS will spend \$435 million on pollution control (Selective Catalytic Reduction or SCR) for Four Corners. The plant was [built 1969-70](#) and is over 45 years old. APS bought Southern California Edison's [48% interest in Units 4 and 5 in 2013 for \\$182 million](#), so the cost to control pollution -- with pollution controls installed over four decades later -- dwarfs the original purchase price of the units. Emissions control costs of \$400 million are over twice the initial purchase price of \$182 million.

APS insists that non-solar customers are subsidizing APS' 44,000 customers with solar rooftops, despite the fact that [many studies](#) dispute this, including a recent study by the conservative [Brookings Institution](#). APS, like the vast majority of fossil-fueled electric utilities, refuses to recognize the enormous costs of pollution to public health ([17-27 cents/kWh for coal according to Dr. Paul Epstein](#) from Harvard), the [hidden costs of leaking coal ash ponds](#), and the looming costs of climate change, drought and extreme weather.

In late May 2016, just before filing its rate case request, APS filed a letter with the Arizona Corporation Commission (ACC) signed by 130 elected officials, business leaders and nonprofits, asking the ACC to rise "above the fray" of "rhetoric -- not facts" about the rate increase. However, APS did not disclose to many of the signers that it had planned to submit this letter in the rate case docket, and a few legislators were upset to learn that they had signed it without understanding how the letter would be used. One legislator, Representative and [Assistant Minority Leader Lynne Pancrazi](#) (D-Yuma) noted that APS CEO Don Brandt's salary is \$8 million/year. He actually earned [\\$11.5 million in 2012](#).

- The increase would pay for \$3.6 billion in utility investments from 2015 through 2018
- The average rate increase would be **8% - 7.96% annually**
- APS wants to spend \$500 million to increase the net site capacity for the Ocotillo natural gas plant in Tempe by 290 MW, from 330 to 620 MW.
- APS would increase the per kW rate charged to solar customers from the current \$0.70/kW to \$3/kW, which would increase the monthly charge from the current ~\$5.00 to \$21.00. APS says the money is needed to cover grid upkeep and cover the cost of distributed solar for the ~44,000 customers (4%, or 44,000/1.2M) with rooftop solar
- APS would add demand charges to all customers with on-site solar.
 - "Demand" charges are based on a customer's highest use for that month; would be \$6.60/kW per month (summer and winter); summer rate would be 15 cents/kWh on-peak (3-8 pm) and 8 cents/kWh other times. Winter peak rate would be 12.7 cents/kWh.

- New demand charges are expected to [cost the average customer ~\\$11/month, and net APS \\$166 million annually](#). However, demand charges could reach as high as [\\$200/month](#).
- APS would reduce current net metering compensation from the retail rate (~12.8 cents/kWh) to the “avoided cost” or wholesale rate of 2.99 cents/kWh.
 - APS’ current 44,000 customers with net metering would be grandfathered and allowed to keep retail net metering for the full life of their solar arrays
 - In the first quarter of 2016, six U.S. utilities filed with regulators to add residential demand charges, and 22 considered or enacted net metering changes. Since 2015, no PUC has yet approved a demand charge for residential customers.
 - NOTE: Salt River Project (SRP), an Arizona municipal utility, effectively killed rooftop solar installations, which [plummeted by 96% from 2014 to 2015](#), when it added demand charges averaging \$50/month for solar customers.
- APS asserts that the current 44,000 solar rooftops has cost non-solar customers a total of \$42.7M, or \$13M/year currently (\$1.23/month).
 - APS says that when 1,300 new solar arrays are added each month, this results in a \$20M/year cost shift by 2020, which, over the 20 year life span of the solar arrays is \$1 billion “cost shift.”
- APS has an ongoing “value of solar” docket at the ACC, Docket E-00000J-14-0023
- Critics point out that APS is only counting costs of distributed solar to the grid, not benefits.
- APS says costs are 70% fixed and 30% variable, while residential rates are 90% variable and 10% fixed, and its current \$17/month fixed charge doesn’t cover costs.
- APS also wants to spend \$3.2 million for a Solar Innovation Study (installing APS-owned residential PV on 75 homes, including battery storage and other options) and \$30 million for its Solar Partner Program.
- Finally, the rate case will reduce solar investments from \$110 million in 2017 to \$1 million in 2018, a 99% reduction
- The rate case includes a 10.5% return on equity

Source: *Powering Growth, Delivering Value, Rate Case Request, March 21-23, 2016, page 7:*

Spending (millions)	2015	2016 (est)	2017 (est)	2018 (est)	TOTALS
Traditional Generation	\$263	\$215	\$211	\$303	\$992M
New Gas Generation	\$66	\$77	\$237	\$112	\$492M
Environmental	\$44	\$235	\$199	\$130	\$608M
Renewable Generation	\$58	\$110	\$1	\$1	\$170M
Transmission	\$201	\$123	\$210	\$120	\$654M
Distribution	\$340	\$357	\$345	\$376	\$1.41 BN
Other	\$85	\$88	\$82	\$82	\$337M
TOTALS	\$1.057 BN	\$1.205 BN	\$1.285 BN	\$1.124 BN	

APS Operations and Maintenance Costs

APS' O&M costs have [ranged from \\$754 million \(2011\) to \\$845 million \(2016 estimated\)](#) per year.

The Arizona Corporation Commission: Captured Regulators?

- APS is widely believed to have [spent \\$3.2 million in 'dark money' campaigns](#) during the 2014 election cycle to elect Commissioners Tom Forese and Doug Little to the five-member panel in 2014. [Commissioners Forese and Little replied that APS has a First Amendment right](#) to spend on campaigns [without disclosing their involvement](#). An [astonishing \\$1.3 million of the total was spent to keep former Commissioner Sandra Kennedy](#) off the bench.
- Commissioner Bob Burns has asked APS and its parent, Pinnacle West, to open its books, but APS has refused so far. In May, Commissioner Burns asked Arizona's Attorney General, Mark Brnovich, whether he had the legal authority to force open APS' books. [Brnovich, despite receiving nearly \\$425,000 in campaign contributions from APS](#), stated that [Commissioner Burns did have that authority](#).
- At the May 2016 Pinnacle West shareholder meeting, shareholders introduced a proposal to disclose contributions to nonprofit advocacy groups that can raise unlimited amounts of money in elections without identifying donors. The proposal grew out of a bruising election in 2014 for two open seats on the AZ Corporation Commission (ACC), when Save Our Future Now and the Arizona Free Enterprise Club [spent \\$2.3 million on](#)

[ads and mailers against pro-solar candidates](#). The Edison Electric Institute spent \$500,000 to affect the outcome as well, and APS gave funding to the [60-Plus Association in 2013, which has openly opposed solar](#). The shareholder resolution earned [5% support](#), a strong showing in the face of management's disapproval and an increase from the same resolution in 2015, when it earned 30% support.

- In 2013, APS reported to the ACC that it [spent \\$3.7 million to support a regulatory change that would have dramatically increased the monthly bill for solar customers](#) by an estimated \$50 per month, but the ACC ultimately approved a \$5.00/month bill increase for solar customers.
- Former Commission Chair Susan Bitter-Smith resigned in December 2015 after Arizona's Attorney General, Mark Brnovich, [sought her removal by the Arizona Supreme Court](#). Brnovich accused Bitter-Smith of conflict of interest for being paid as a lobbyist, with [one contract paying \\$150,000 per year](#) in addition to her Commissioner pay of \$80,000 per year.
- Former Chair of the ACC, Gary Pierce, was questioned by the FBI in June 2016 about campaign spending in the 2014 election cycle. Gary Pierce's son, Justin, was the beneficiary of a jaw-dropping \$752,000 to support Justin's unsuccessful run for AZ Secretary of State. The money was spent by the Arizona Free Enterprise Club, which the Arizona Republic reports is widely believed to be a front for APS. The FBI also [questioned Commission staff](#).

APS Influence With State Government

In January 2015 an [APS lobbyist secretly authored a letter](#) signed by six Arizona Congresspersons (Democrat Reps. Ron Barber, Ann Kirkpatrick and Kyrsten Sinema, and Republican Reps. Trent Franks, Paul Gosar and Matt Salmon) to the Federal Trade Commission and the Consumer Financial Protection Bureau asking them to look into purported consumer fraud in the residential solar market. Several of the lawmakers have received funds from APS' parent company, Pinnacle West.

In mid-April 2016, solar advocacy group the Energy Freedom Coalition, backed by SolarCity and headed up by former Arizona Corporation Commissioner Kris Mayes, launched a ballot initiative that would have guaranteed retail rates for net metering customers, and prevented additional demand charges. In response, APS went to the legislature to refer a measure (the power of referendum allows legislators to ["refer" an initiative to the ballot](#) *without* the need to collect hundreds of thousands of signatures) that would have required [separate rates for solar](#). The ballot initiative is now defunct and no new plans have been announced by the Energy Freedom Coalition.