

## Quick Reference Guide to Solar Energy and Net Metering

**No company has done more than APS to promote solar in Arizona.**

Arizona and APS continue to be national solar leaders. Arizona now ranks second in the country for rooftop solar installations and is first among all states in utility-scale solar installations.<sup>1</sup>

In 2012 APS added a record 148 megawatts (MW) of solar. We expect to double this number in 2013.

With a mix of customer rooftop systems, large solar facilities built by developers and owned by APS and power purchased from competitive providers, APS will have nearly **700 MW** of solar on the grid by the end of 2013. That's enough to power **175,000 customers** and puts APS ahead of schedule to meet the state's renewable energy targets.



### 2012

- 83 MW of rooftop solar, more than half of all installed solar
- Ranked #4 among U.S. utilities for solar installation<sup>2</sup>
- Completed two APS-owned solar power plants, part of AZ Sun – Chino Valley (above) and Hyder.



### 2013

- 250 MW Solana Generating Station (above), the largest solar power plant of its kind in the world, will come online.
- Additional rooftop solar: about 150 applications per week on average
- Foothills (above left) and Hyder II solar power plants to come online as part of AZ Sun

Sources:

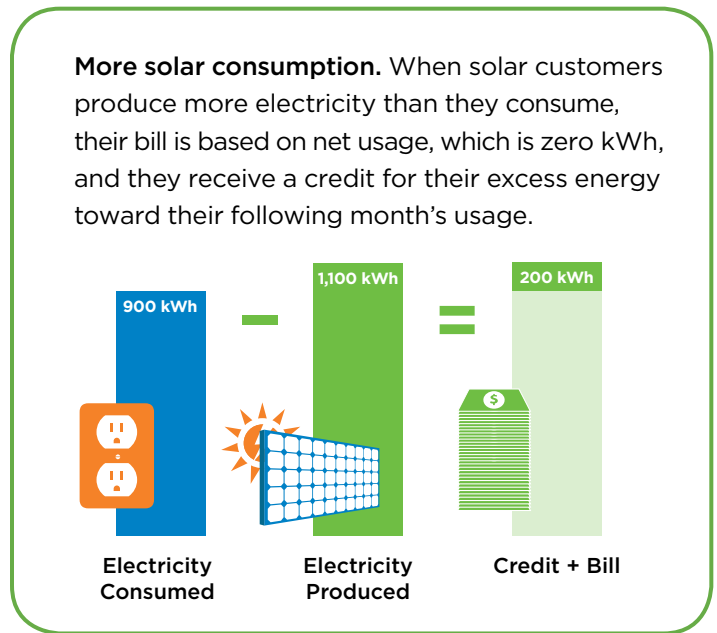
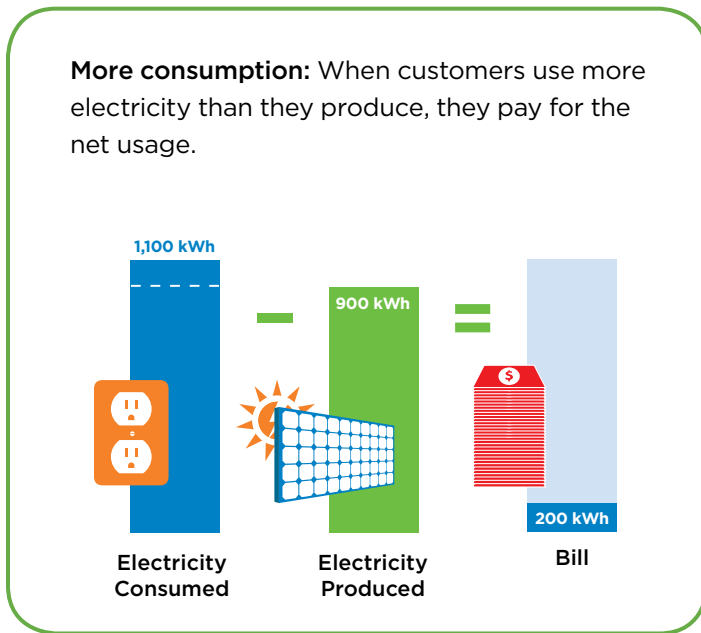
<sup>1</sup> 2012 U.S. Solar Market Insight Report, Solar Energy Industries Association

<sup>2</sup> Solar Electric Power Association, 2013

# Net metering basics

Net metering is the way APS and other electric utilities compensate owners of rooftop solar for the electricity they produce.

For solar customers, APS subtracts the amount of electricity generated by their solar panels from the amount of electricity they use (in kilowatt-hours, kWh for short).



## The issue is about cost fairness for all customers

The APS retail rate covers lots of things, but in general it covers (1) the power a customer consumes and (2) the infrastructure that delivers the power to them.

When a rooftop solar customer generates a kilowatt-hour of energy, he or she avoids paying the retail rate.

That means they avoid paying for the power, which is fair because they didn't use it; but also they avoid paying for the wires, poles and transformers that delivered the power.

**Net-metered customers use the grid differently than other customers, but they still rely on it to make their solar rooftop systems operate.**

Customers who self-generate don't disconnect from the grid. They still receive its benefits. For example, APS operators work behind the scenes to smooth out the intermittency of solar power – that is, when a cloud

passes over the panels, the grid delivers power. Or, when the pool pump goes on and a home's load exceeds the amount of electricity they are generating, the grid delivers power.

The grid also becomes a virtual short-term battery. Customers put power in during the day and take it out at night. They use it as a virtual long-term battery too – banking power on the sunny cool days of spring to use during hot summer months.

**The trouble is that since these customers aren't paying the costs of the grid, someone else has to pay. The "someone else" is the customers who do not or cannot choose to put solar on their rooftops.**

This is simply a customer issue and a fairness issue. Non-solar customers are paying higher rates to subsidize rooftop solar.

# Rooftop solar subsidy adds costs for non-solar customers

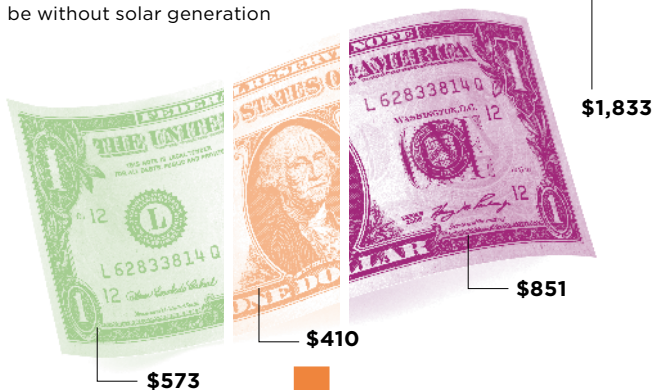
APS estimates that each new rooftop solar system adds \$1,000 in costs each year for non-solar customers over the 20-year life of each system. In effect, non-solar customers are paying for their solar neighbors. As more customers install solar, this means more costs will shift to a shrinking number of non-solar customers, whose electricity rates will go higher and higher. With APS receiving about 150 new solar incentive applications every week on average, it's not hard to see that this subsidy is unsustainable.

## Breaking down the bill

- What the customer actually pays
- Savings created by rooftop solar
- Remaining unpaid costs (subsidy)

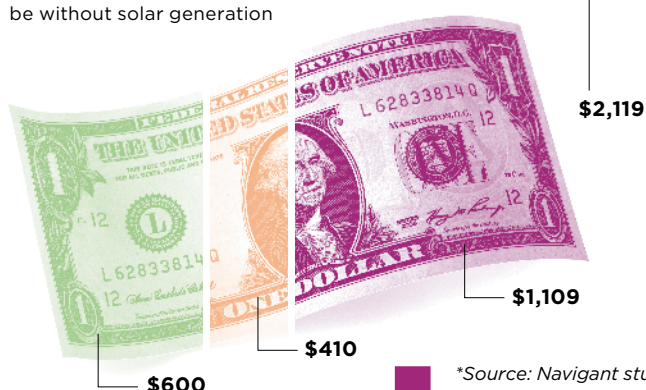
### Time of Use Rate

What the total annual bill would be without solar generation



### Standard Rate

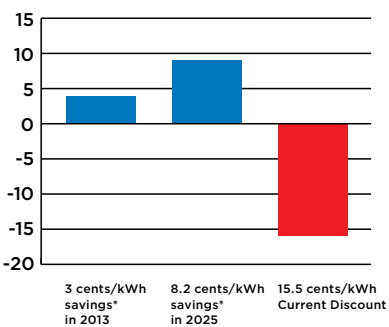
What the total annual bill would be without solar generation



\*Source: Navigant study, 2012. Based on actual 2011 customer usage data for the average customer on that rate.

## Savings

Rooftop solar customers do provide some cost benefits to the APS system, such as avoided fuel costs.



Currently, despite providing about 3 cents/kWh of savings today, solar customers receive an average discount of 15.5 cents/kWh.

\*Source: SAIC 2013 Updated Solar PV Value Report

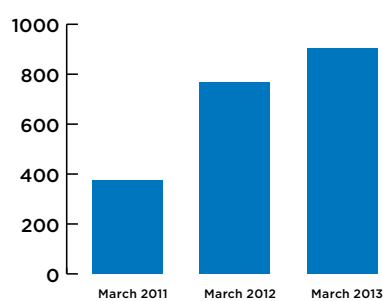
## The Subsidy

Factoring in the savings rooftop solar provides, there are still costs that solar customers do not pay, such as substations, power lines, poles and other infrastructure. That amounts to a subsidy of about \$1,000 per year for each solar installation, or \$20,000 over a lifetime – paid by all customers without rooftop solar.

### A Growing Problem

As more customers install solar, these higher costs are spread over fewer customers.

### Rooftop Solar Applications



# Making solar sustainable in Arizona

APS wants solar to be successful for the long-term. This is in our DNA as both Arizonans and a modern electric utility.

That's why we are discussing this issue now. If the issue is addressed too late, a predictable outcome is rate revolt from the non-solar customers and a lot of unhappy rooftop solar customers who are locked into long-term contracts. In this scenario, everyone loses. That's what we're trying to avoid.

We have convened a series of meetings with the solar industry, open to the public and any interested stakeholders, to put the facts on the table and consider solutions. We believe open dialogue is in the best interest of everyone.

If we want to continue Arizona's leadership, solar needs to be fair to all customers and sustainable for the future.

We're confident this discussion can lead to a solution that protects current owners of rooftop solar, preserves that option for future customers and treats non-solar customers fairly.

That is the best way to continue the growth of the solar power industry in Arizona.



## ARIZONA'S SOLAR LEADERSHIP: BY THE NUMBERS

<b>2nd</b>	Arizona's national rank for solar energy production
<b>4th</b>	APS's rank among U.S. electric utilities for solar added in 2012
<b>15%</b>	Portion of APS's overall generation portfolio that must come from renewable energy sources, including solar, by 2025 as part of Arizona's Renewable Energy Standard (RES)
<b>30%</b>	Portion of the RES that must come from distributed energy - primarily solar panels
<b>12%</b>	Amount of renewable energy APS expects to have in its portfolio by the end of 2015, more than double the cumulative RES requirement
<b>700MW</b>	Total solar energy generation - including rooftop - expected on the APS system by the end of 2013
<b>175,000</b>	Number of Arizona homes APS solar energy will power by year-end
<b>18,000</b>	Approximate number of homes with rooftop solar systems in APS service area
<b>83%</b>	Portion of renewable energy on the APS system in 2015 expected to be owned by solar developers and customers
<b>100%</b>	Of solar power plants - both utility-scale and rooftop - built by third party developers and installers

## NET METERING SUBSIDY: BY THE NUMBERS

<b>\$20,000</b>	Average cost each solar rooftop adds for non-solar customers over the lifetime of the system
<b>150</b>	Average number of new solar applications APS receives each week. <sup>1</sup>
<b>15.5 cents per kilowatt-hour</b>	Average discount solar customers receive from the current net metering structure
<b>3 cents per kilowatt-hour</b>	Average savings rooftop solar provides <sup>2</sup>
<b>24.5 cents per kilowatt-hour</b>	Retail rate in summer during on-peak hours (APS currently credit net metering customers for the energy they produce at the retail rate).
<b>5 cents per kilowatt-hour</b>	Average rate at which APS can purchase energy on the open market

Sources:

<sup>1</sup> As of 1st quarter 2013.

<sup>2</sup> SAIC 2013 Updated Solar PV Value Report

