

APS Renewable Energy

Overall Commitment and Distributive Energy Program

DOE Tribal Energy Summit
December 20, 2011

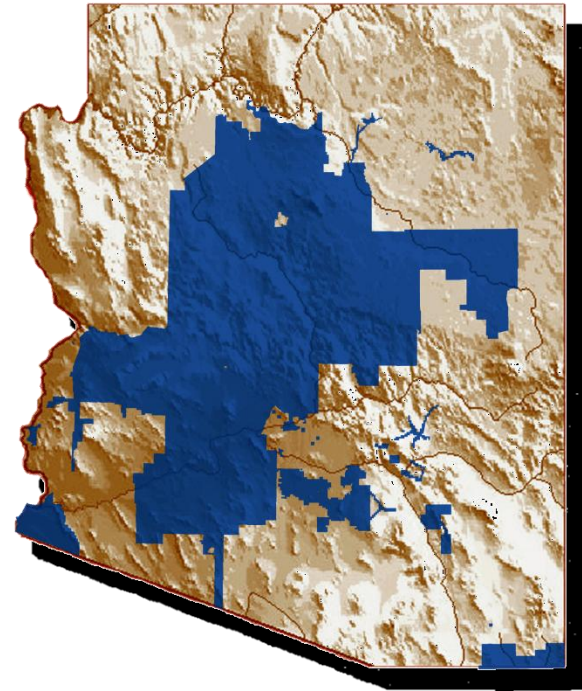
Arvin Trujillo
4CPP-Government Relations



About Arizona Public Service Co.

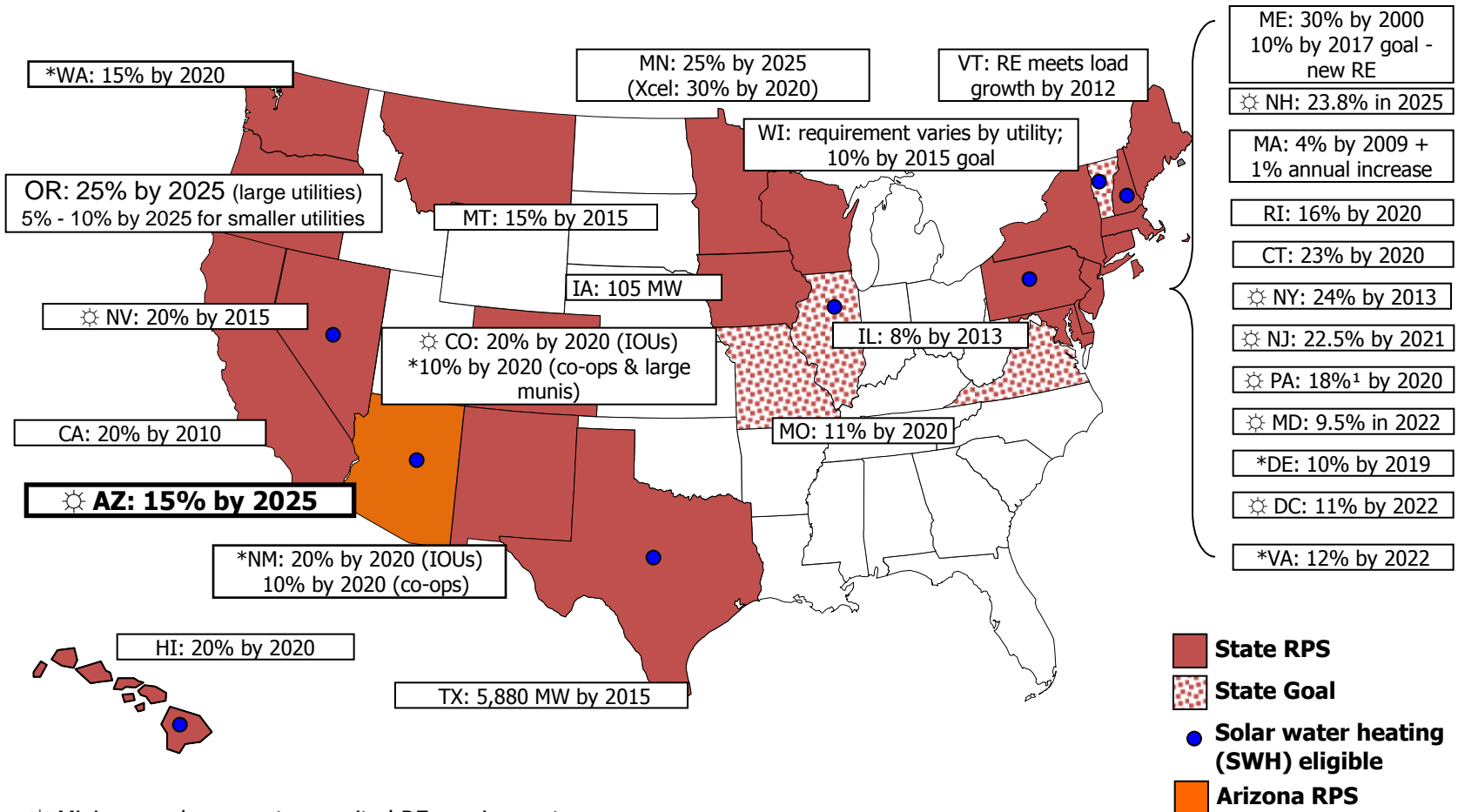
“APS”

- APS has the 5th Largest Service Territory in US & over 1M customers
- Arizona is one of the fastest growing states in the nation
- Energy demand will increase almost 50% in 20 yrs
- Our customer growth has been 3 times U.S. Average
- 5,039 miles of transmission lines in APS territory



APS Retail Service Territory

Renewable Energy Standards in the U.S.



☀ Minimum solar or customer-sited RE requirement

* Increased credit for solar or customer-sited RE

¹PA: 8% Tier I / 10% Tier II (includes non-renewables); SWH is a Tier II resource

APS Commitment to Renewable Energy

Renewable Energy Today

APS's renewable energy portfolio is expanding rapidly, growing from less than one megawatt in 2001 to **362 megawatts (MW)** today. This is enough power to meet the needs of **91,000** customers.

Renewable Energy Incentive Program

To help customers with the cost of adding renewable energy systems to their homes or businesses, APS offers the Renewable Energy Incentive Program.

KEY FACTS

- Started in 2002 with photovoltaic solar electric systems and then added solar water heaters in 2003.
- Additional incentives were added in May 2008 for wind, biogas/biomass and geothermal.
- More than **17,500** APS customers have participated in the program since inception.

Portfolio By Technology Type



WIND
190 MW with an additional 99 MW being developed.



SOLAR
145 MW with an additional 466 MW being developed.



BIOMASS
14 MW



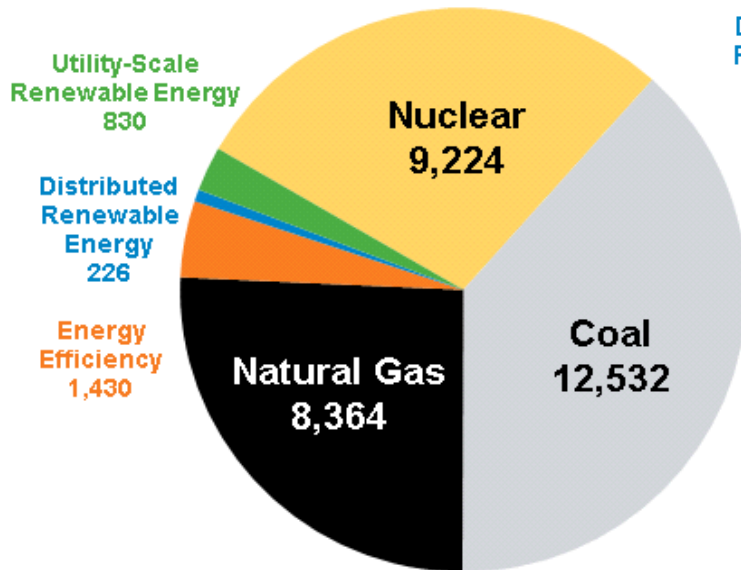
GEOTHERMAL
10 MW



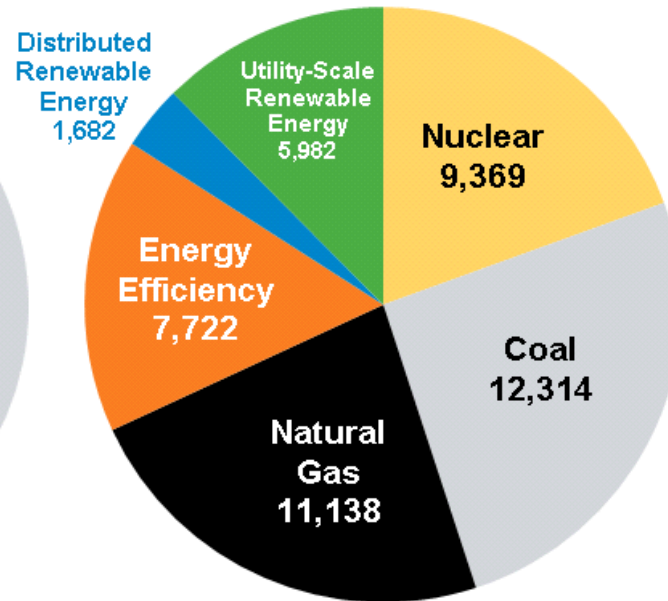
BIOGAS
3 MW with an additional 3 MW being developed.

APS Energy Sources 2011 vs. 2025

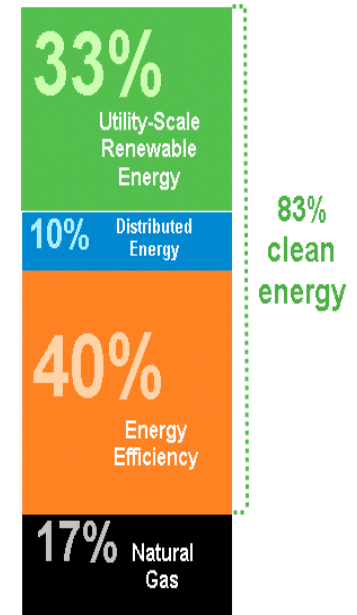
2011
Energy Mix
32,606 GWh



2025
Energy Mix
48,207 GWh



APS Energy Growth Sources
2011 - 2025



Solar Segments



Distributed Energy

3kW – 10MW

Customer Sited



Small Utility-Scale

1 – 20MW

Distribution Level



Large Utility-Scale

>50 MW

Central Station

Distributed Programs

Distributed Energy Incentive Program

- **Technologies**

- Solar thermal
- Solar photovoltaic
- Biomass and Biogas
- Geothermal – direct and indirect
- Solar daylighting
- Wind (small scale)
- Non-residential pool heating
- Solar cooling/HVAC
- Combined heat and power (CHP)

- Residential and Non-Residential







- Production Based Incentives (PBIs)

- Payment over time based on system output

- Up Front Incentives

- Payment at installation based on system size

Business Renewable Energy Options
Businesses can benefit with APS rebates and programs for:

SOLAR 	BIOGAS & BIOMASS 
WIND 	GEOTHERMAL 
HYDRO 	OTHER 

How Solar Is Used by Customers



Deer Valley High School, Glendale, AZ - 1 MW installation

How Solar Is Used by Customers

ASU

ASU is committed to expanding solar installations across all four campuses to a total of 10 MW by the end of 2010, and 20 MW by 2020.



ASU Apache Blvd Parking Structure

Source: http://www.asu.edu/fm/albums/energy/campus_solarization.htm

How Solar Is Used by Customers



Solar Daylighting

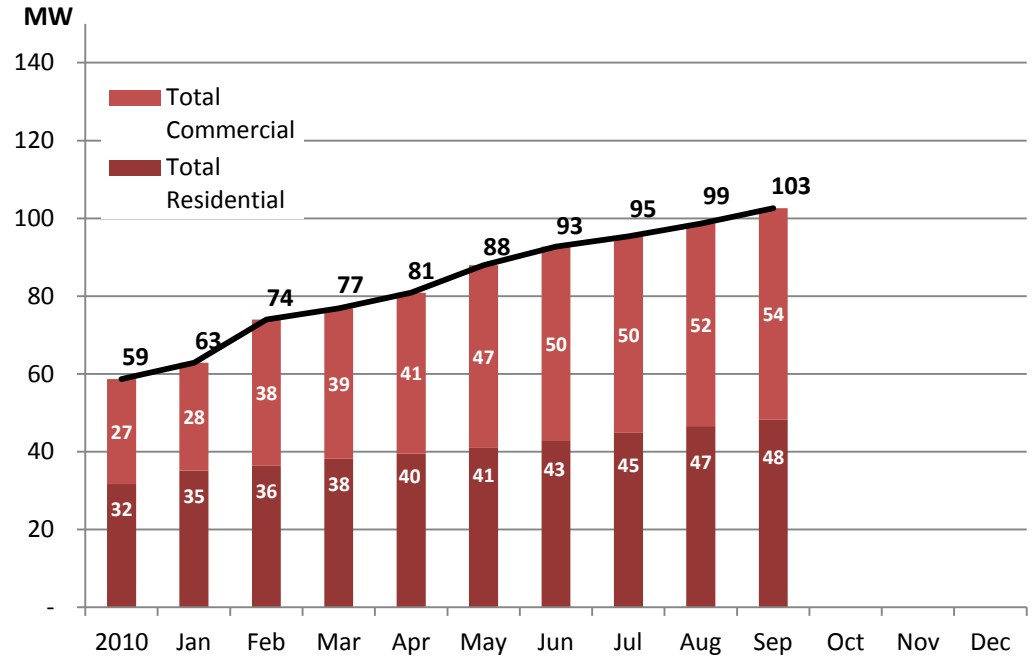


Solar Daylighting with PV

Distributed Energy Growth



Installed DE Cumulative Capacity



- More than 17,000 customers have participated in APS programs
- Incentive have declined each year, but demand remains strong

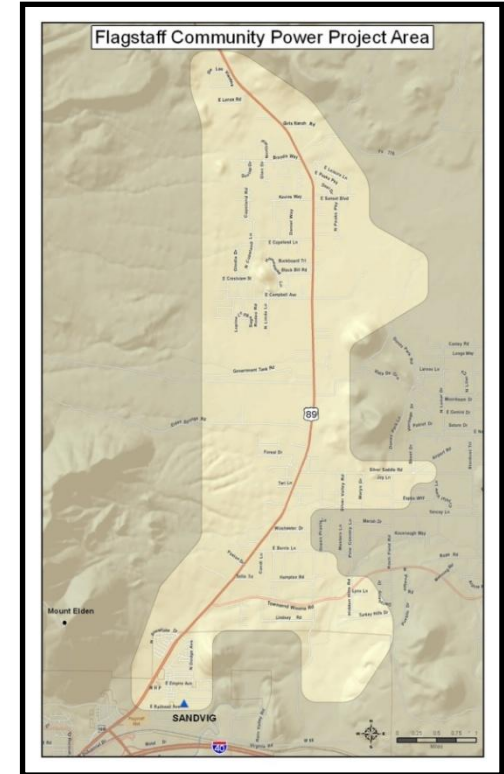
Community Power Project - Flagstaff

A new approach for solar resources on customer rooftops

- APS ownership of roof-top systems
- Provides insight on adoption, service, O&M and operations
- Build additional markets for customers

APS pilot project to evaluate operations with high PV penetration on a single distribution feeder

- Builds on findings from the APS 2009 R.W. Beck study on the cost and value of distributed energy resources



Status of Flagstaff Pilot

Customer Perspective

- Customer interest is high and implies relationship to overall satisfaction
- Works to minimize cost transfer among greater range of customers
- Increases opportunity for renewable energy adoption

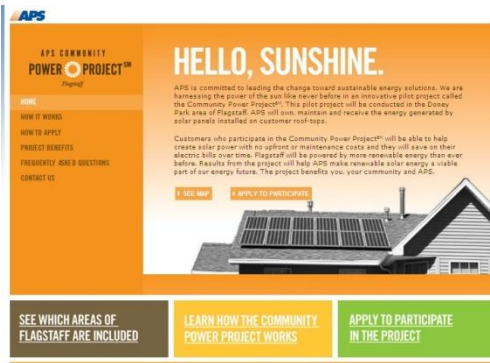


Residential

- APS has received over 344 residential applicants from the approximately 2,400 customer pool
- 120 completed installs = 420kW
- 6 installs remaining - will be completed by EOY 2011

Commercial

- Cromer Elementary School in the Flagstaff Unified School District will host 400kW system



2012 Implementation Plan

- Compliance with annual and 2009 Settlement commitments
- 100 MW expansion of the AZ Sun program
- Expansion of APS ownership in the Schools and Government program and other future DE initiatives
- Residential and commercial incentive program adjustments
- Opportunities to simplify, streamline, and increase customer/industry awareness and knowledge of programs

The Utility Business is Changing

New Challenges:

- **New technologies** – on both sides of the meter
- **Emerging policies** – state and federal, mandates, incentives, environmental, etc.
- **Heightened economic concerns** – cost of energy and impact on jobs

Retain Focus

- Safety
- Reliability
- Cost
- Environmental impact



Contact

- If your tribe is interested in finding more about programs provided by APS, please contact:

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