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# CPS Energy's Generation Strategy

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# CPS ENERGY: *BY THE NUMBERS*

**#1**

Largest municipally-owned electric and gas Utility in US

**786K**  
**339K**

Electric and Gas Customers

**AA+**

Premier credit rating

**\$11B**  
**\$2.5B**

\$11B in assets  
\$2.5B in annual revenue

**#1**

Solar leader in Texas; Tenth in the nation.

## New Energy Economy Partnerships

**↑ \$1.4B**  
Economic Impact

Annual economic impact to San Antonio community

**>900**  
Jobs

More than 1,000 new jobs have been committed to San Antonio by our NEE partners.



# VISION 2020

Vision 2020 transitions CPS Energy from a company that is highly dependent on traditional generation power sources to a company that provides **competitively priced power based on a diverse generation portfolio.**

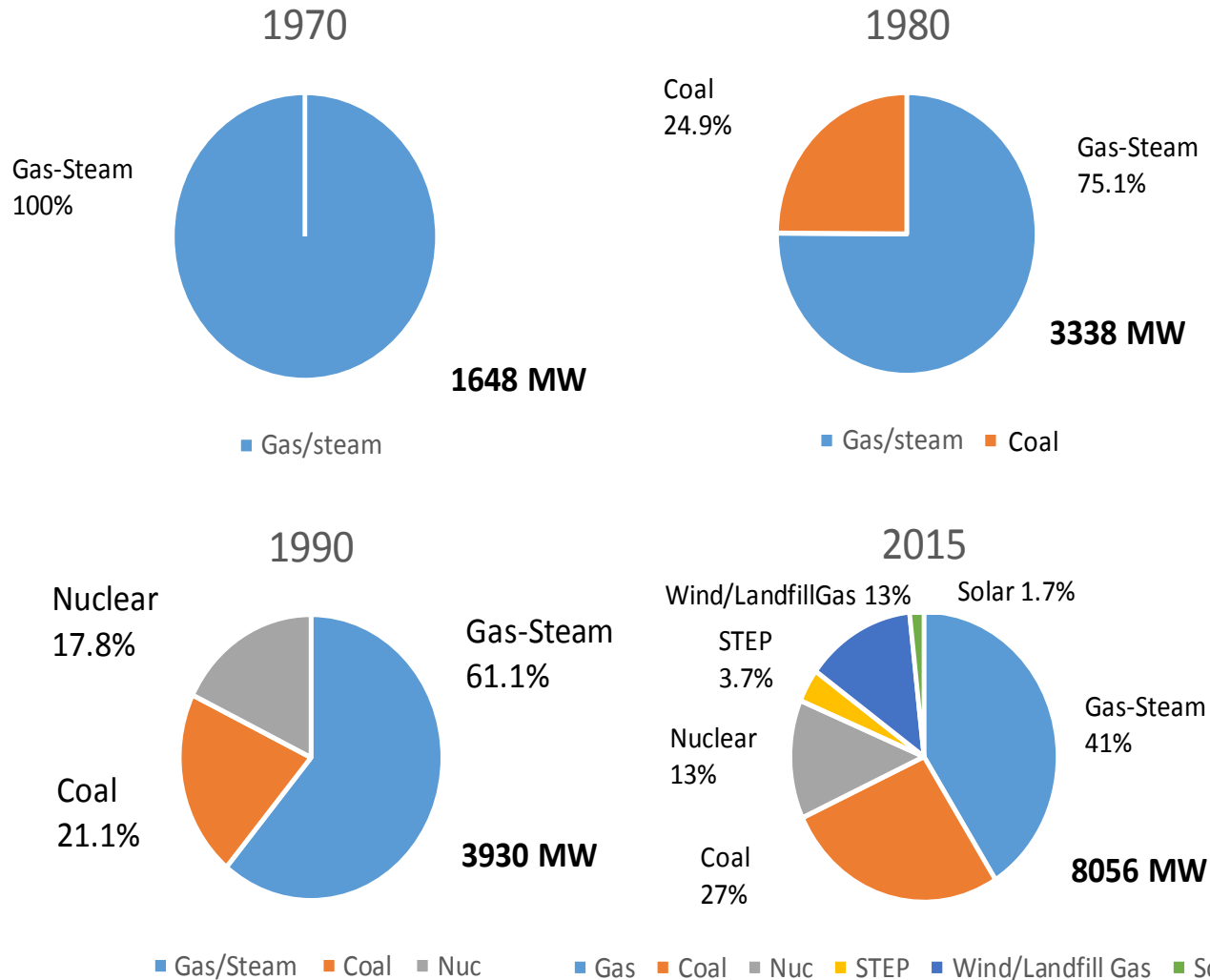
20% renewable energy capacity in power generation mix

65% of generation low-carbon



# Diversification

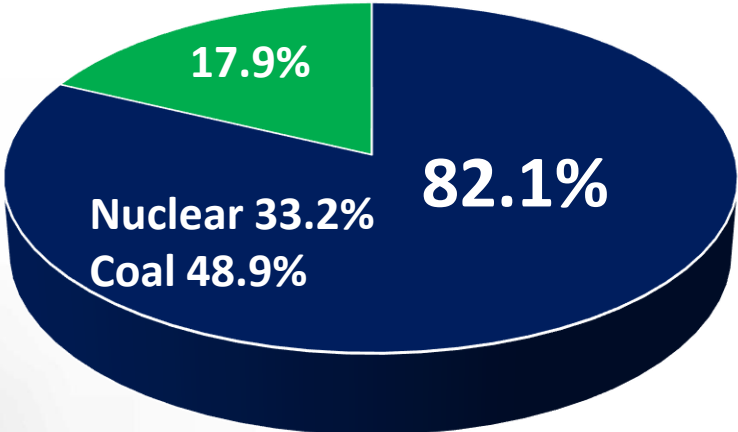
Fuel and Technology Diversification - Installed Capacity



# Generation Mix

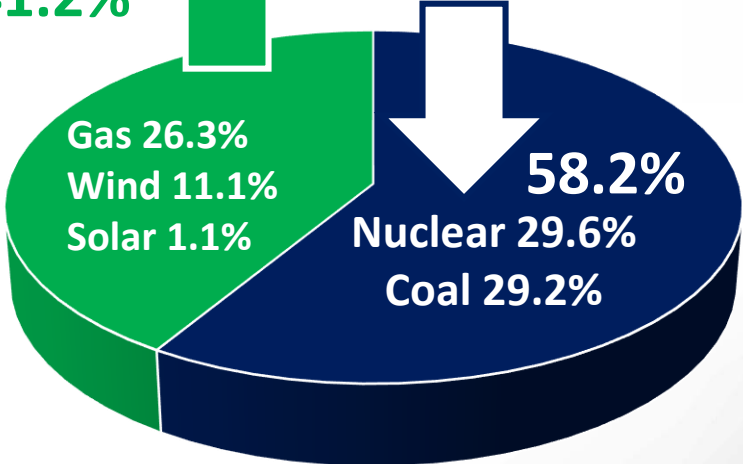
**2010**

Renewables and Gas



**2015**

Renewables and Gas  
**41.2%**



■ Coal & Nuclear ■ Renewables & Gas

■ Coal & Nuclear ■ Renewables & Gas



# HOW WE GOT HERE

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## Innovative Strategic Approach

- Actively managing risk through diversification of generation sources
- Reducing carbon intensity / transitioning to a cleaner fleet
- Pursuing affordable renewables, supported by more flexible & dynamic traditional thermal fleet
- Leveraging clean energy development & energy efficiency initiatives to create economic opportunity in San Antonio

## Our actions have included:

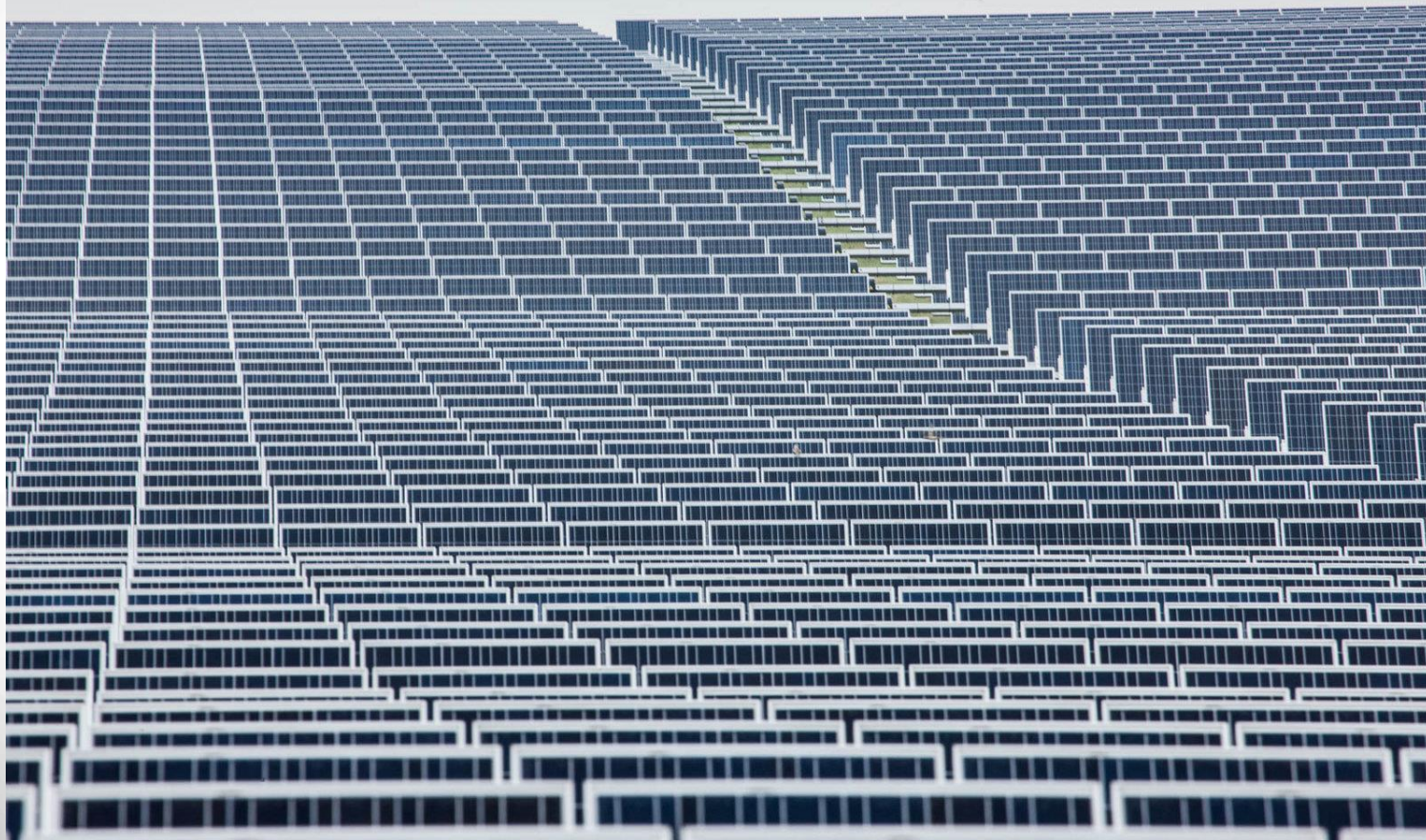
- Early deactivation of coal (Deely 1 & 2) & use of ultra-low sulfur coal
- Purchase of an 800MW Natural Gas Combined Cycle (Rio Nogales)
- Deployment of 500MW of Solar & 1059 MW of Wind
- Innovative & strong local rooftop solar market (~50 MW)
- STEP 771 MW - Demand Response & Energy Efficiency

*“CPS Energy’s strategic goals and decisions are among the most progressive in the country. It is shooting for 20 percent renewable energy generation capacity by 2020 and has plans to mothball one of its 1970s-era coal plants in 2018, 15 years earlier than expected.”*

*-Jim Marsten, Founding Director of the Texas office of Environmental Defense Fund (EDF)*

# CPS ENERGY IS #1 IN SOLAR FOR TEXAS

Somerset Solar Farm - Southeast San Antonio



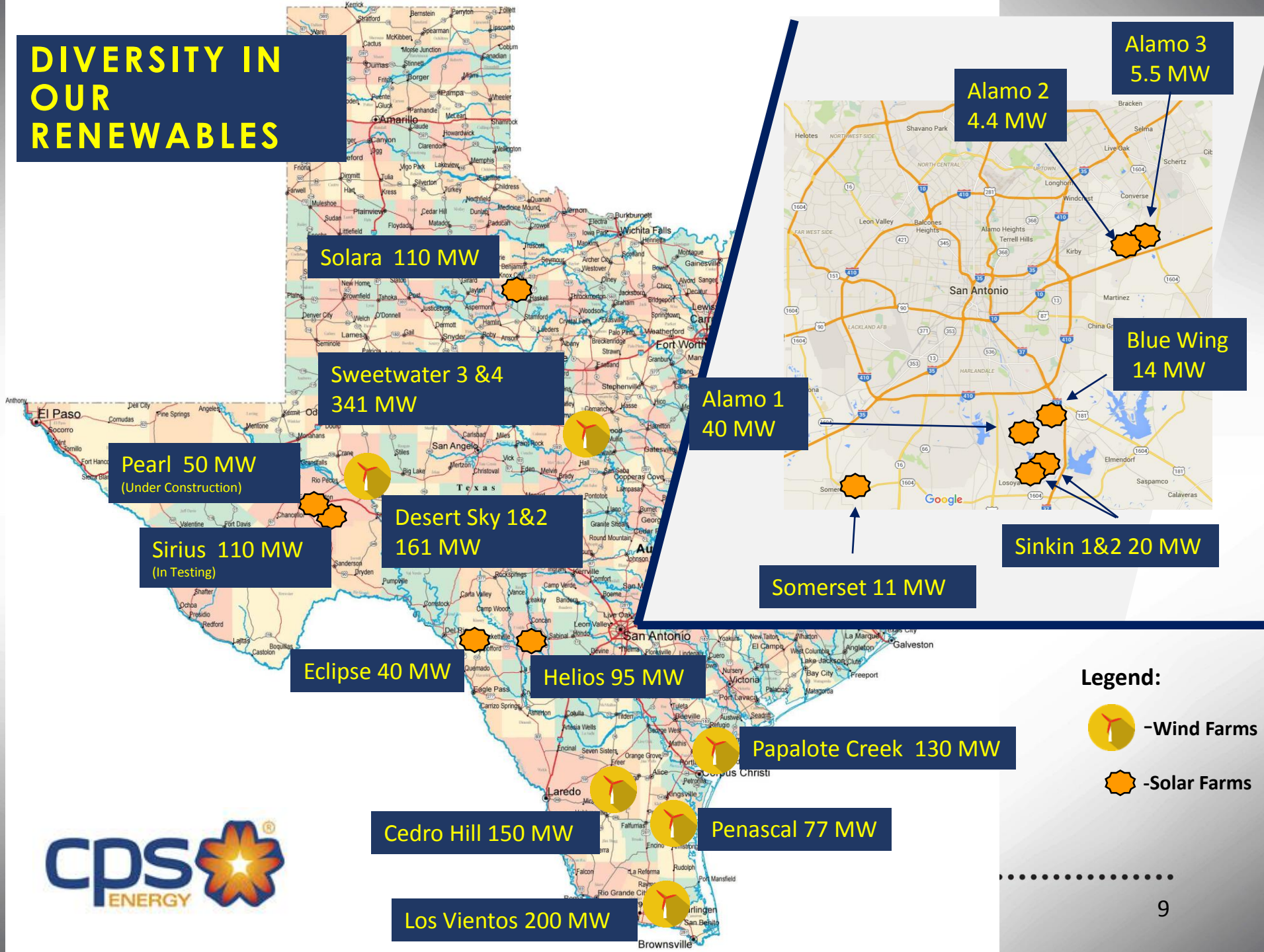
# WIND IS A LARGE PART OF GENERATION MIX

Desert Sky Wind Farm - Iraan, TX Pecos County





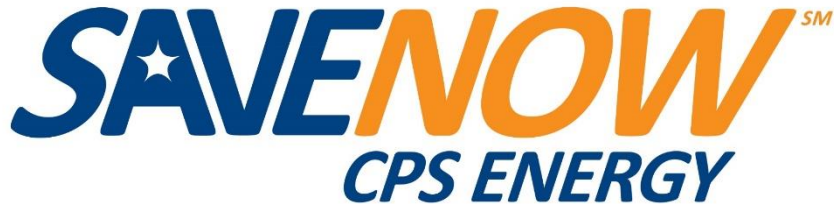
# DIVERSITY IN OUR RENEWABLES



- Legend:**
-  - Wind Farms
  -  - Solar Farms



# OPTIONS, CHOICES & CONVENIENCE FOR OUR CUSTOMERS



- Residential and commercial energy efficiency
- Home Manager
- Smart Thermostat



- Weatherization Program



- Electric vehicle charging network

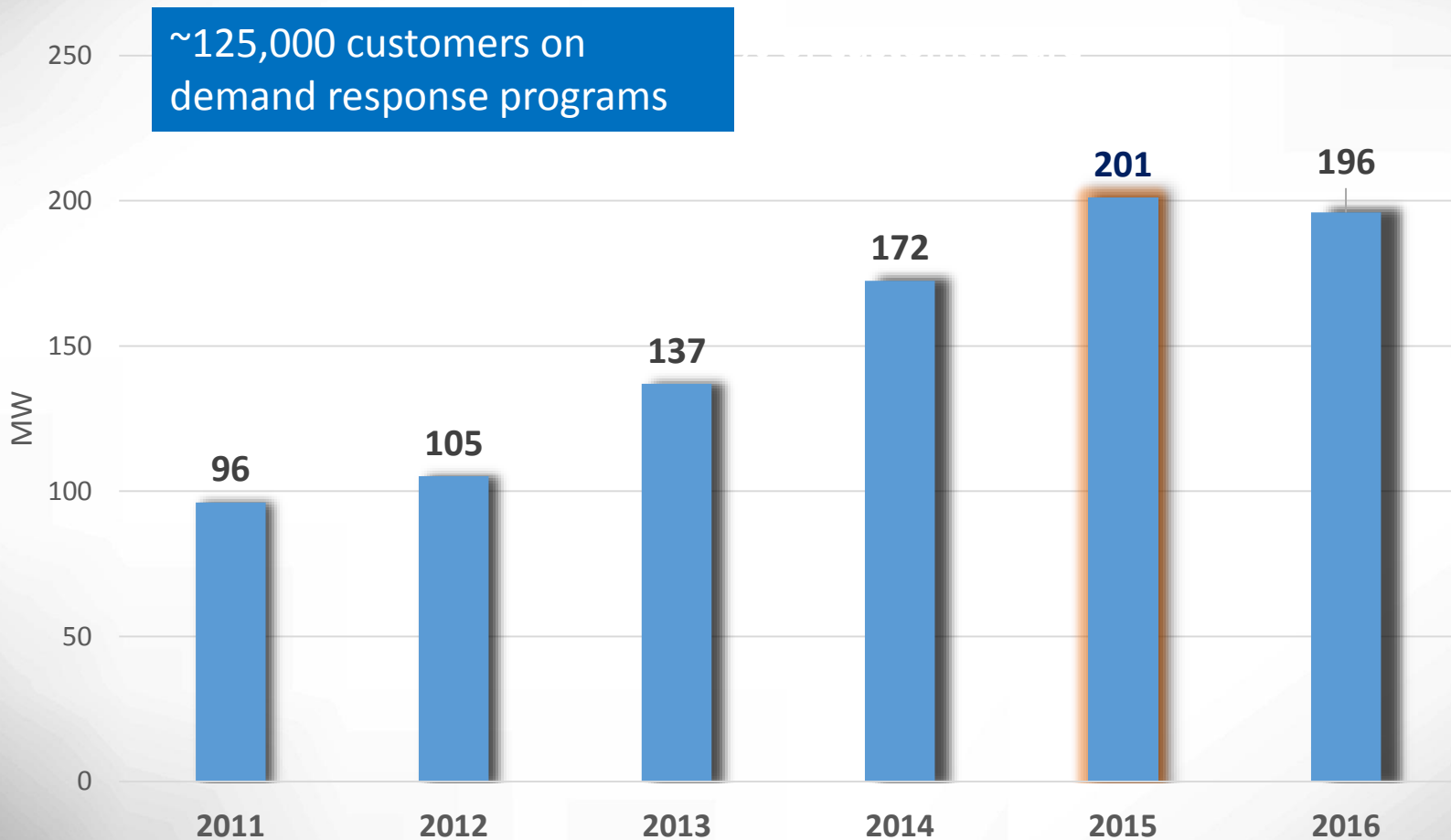


- SolarHost SA
- Roofless Solar

MY THERMOSTAT REWARDS

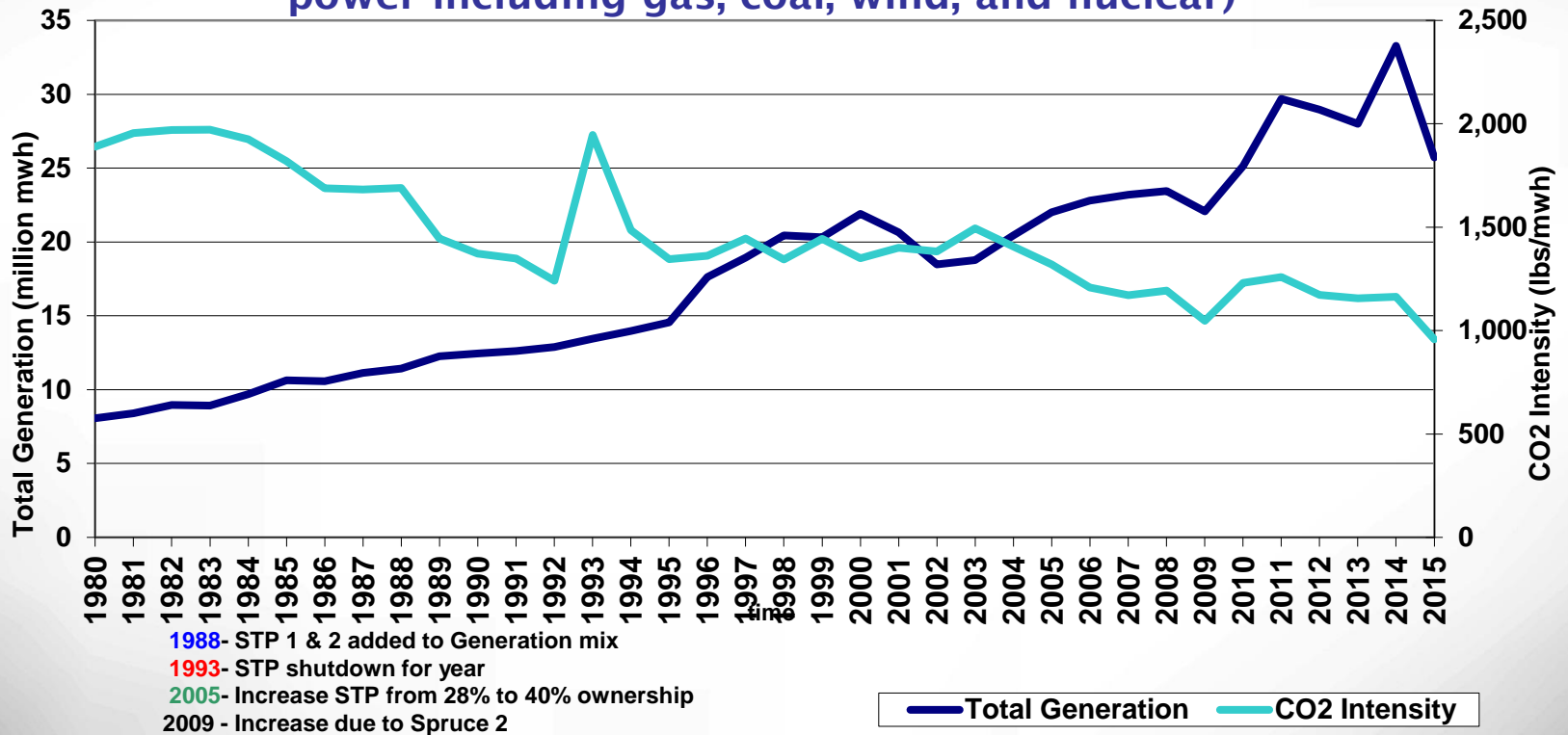
- Nest
- Energy Hub
- Honeywell
- Weather Bug

# DEMAND RESPONSE EQUIVALENT TO A SMALL POWER PLANT



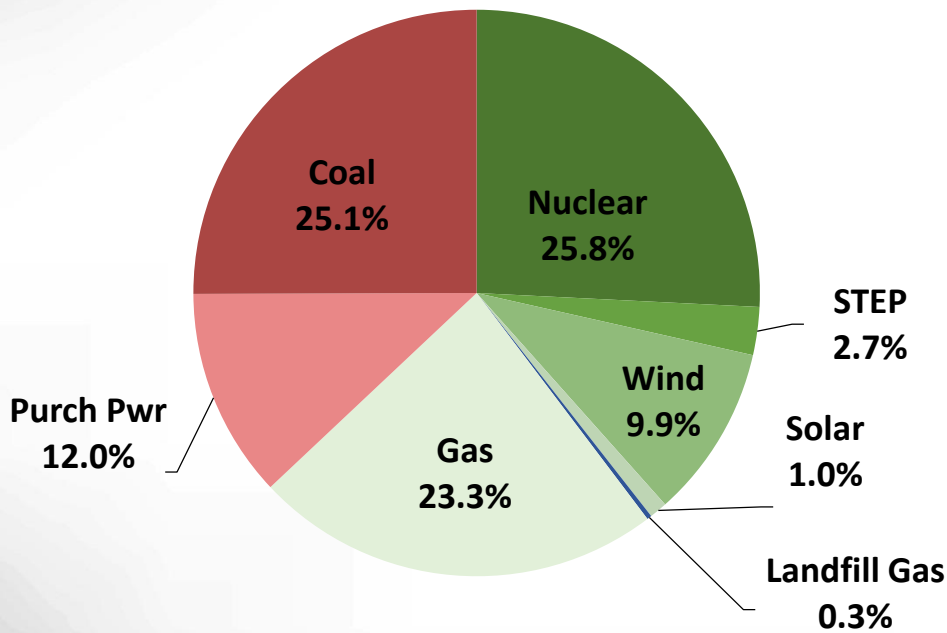
# CPS ENERGY CO2 INTENSITY

Historical CO<sub>2</sub> Intensity for CPS Energy (lbs of CO<sub>2</sub> emissions per net mwh of generation from all sources of power including gas, coal, wind, and nuclear)

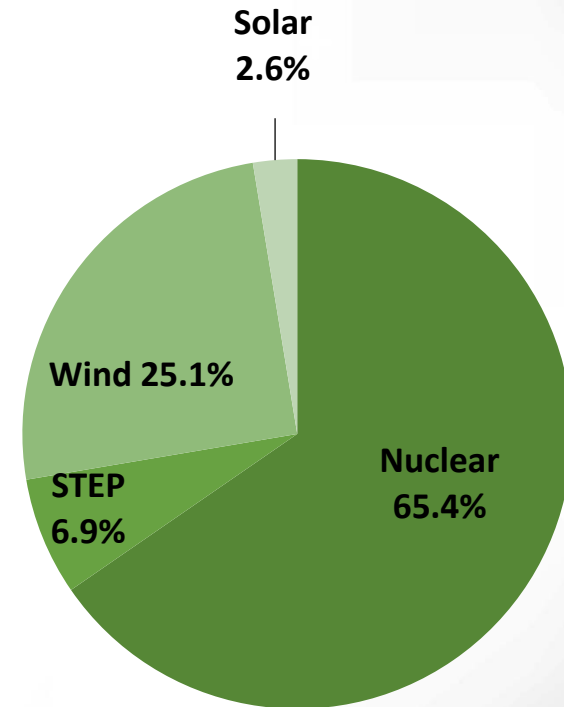


# WE ARE CLOSE TO MEETING GOAL OF 65% LOWER CARBON EMISSIONS

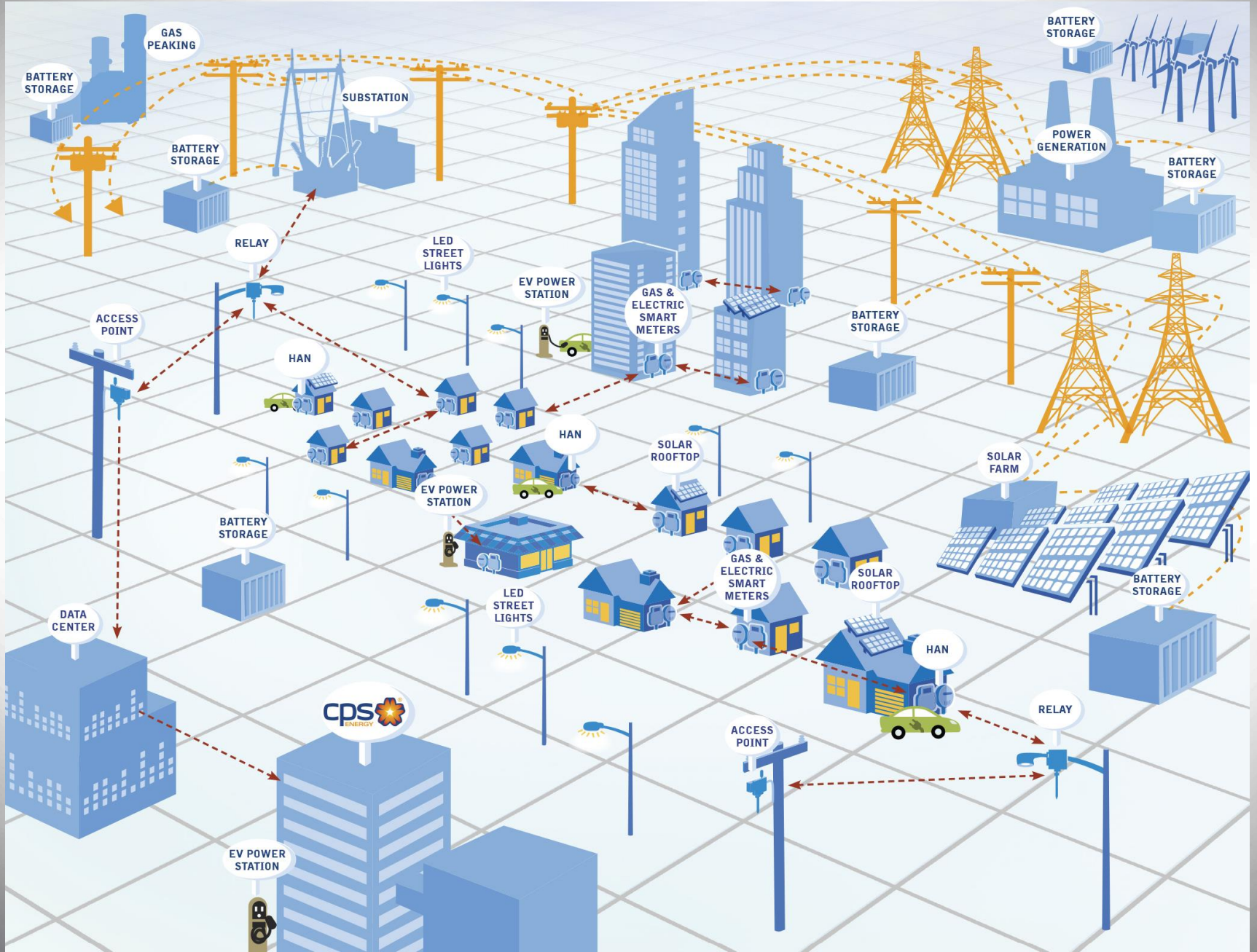
**Total Generation**



**Total Carbon-Free Generation**



# INTELLIGENCE & AUTOMATION OF GRID



# STRONG VALUE PROPOSITION FOR GRID 2.0

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## CURRENT STATE

- 13M miles driven annually
- 103K miles walked annually
- 4.1M calls answered annually
- Old processes

## FUTURE STATE

Automating processes

Better data and decision making

New products & services

Accelerated customer response  
& problem resolution

# BATTERY STORAGE PROJECT



## Solar

5 MW Solar PV Facility



## Battery Energy Storage System

10 MW-1hr Battery or  
5 MW-2hr Battery

Will reduce the emissions of pollutants through Solar Shifting in addition to providing Ancillary Services in the ERCOT market.



# TECHNOLOGY INNOVATION PILOTS

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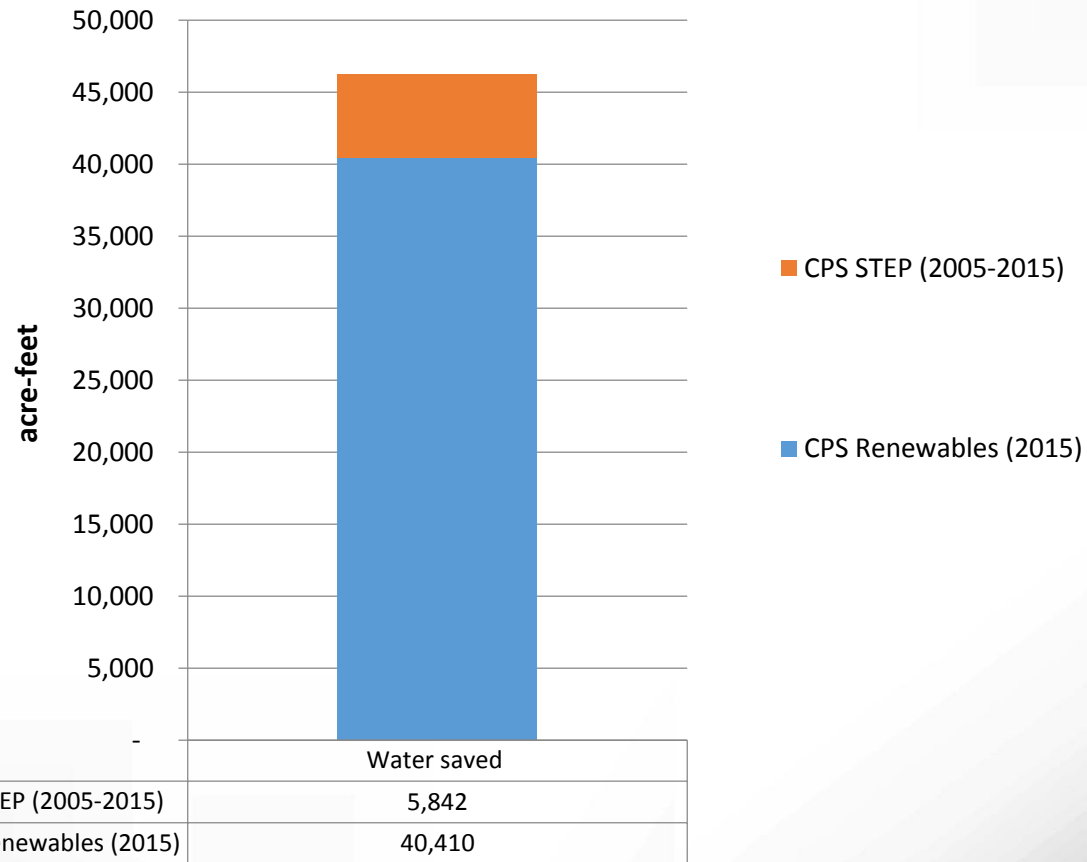


Photovoltaic system paired with a 75kW battery system

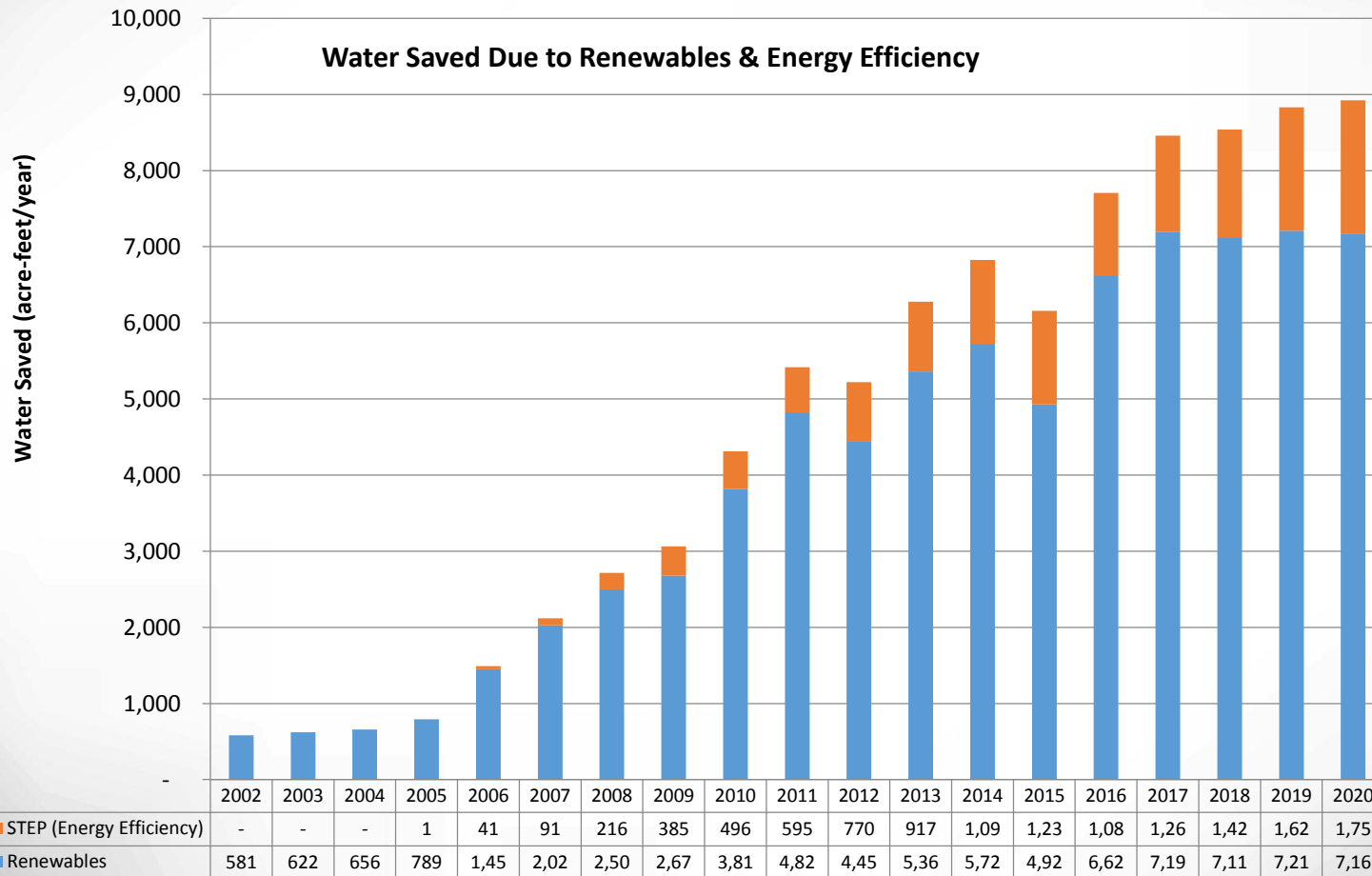
## CPS Energy Microgrid

- **Partners:** JBSA, UTSA, Omnetric, Duke Energy
- **Location:** Fort Sam Houston Library
- **Purpose:**
  - Microgrid can isolate from the grid for resiliency and back-up purposes
  - The lessons learned from this pilot will allow for future installations throughout the service territory increasing the robustness of the utility grid

# CUMULATIVE HISTORICAL WATER SAVINGS



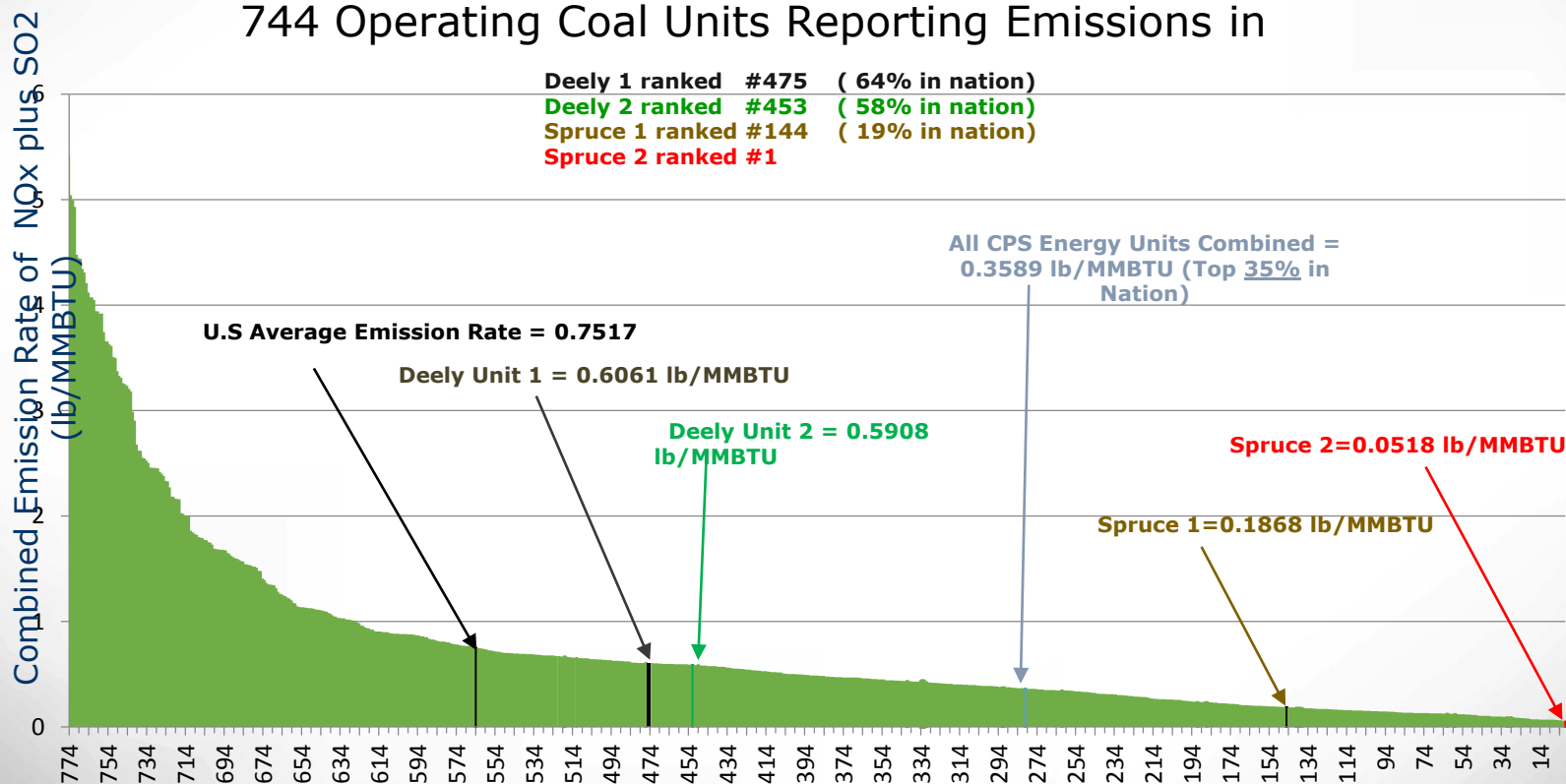
# ANNUAL WATER SAVINGS



# COMBINED NO<sub>x</sub> + SO<sub>2</sub> RATE RANKING

## Generating Unit Emission Rates - 2015

Combined NO<sub>x</sub> plus SO<sub>2</sub> (lb/MMBTU)  
744 Operating Coal Units Reporting Emissions in

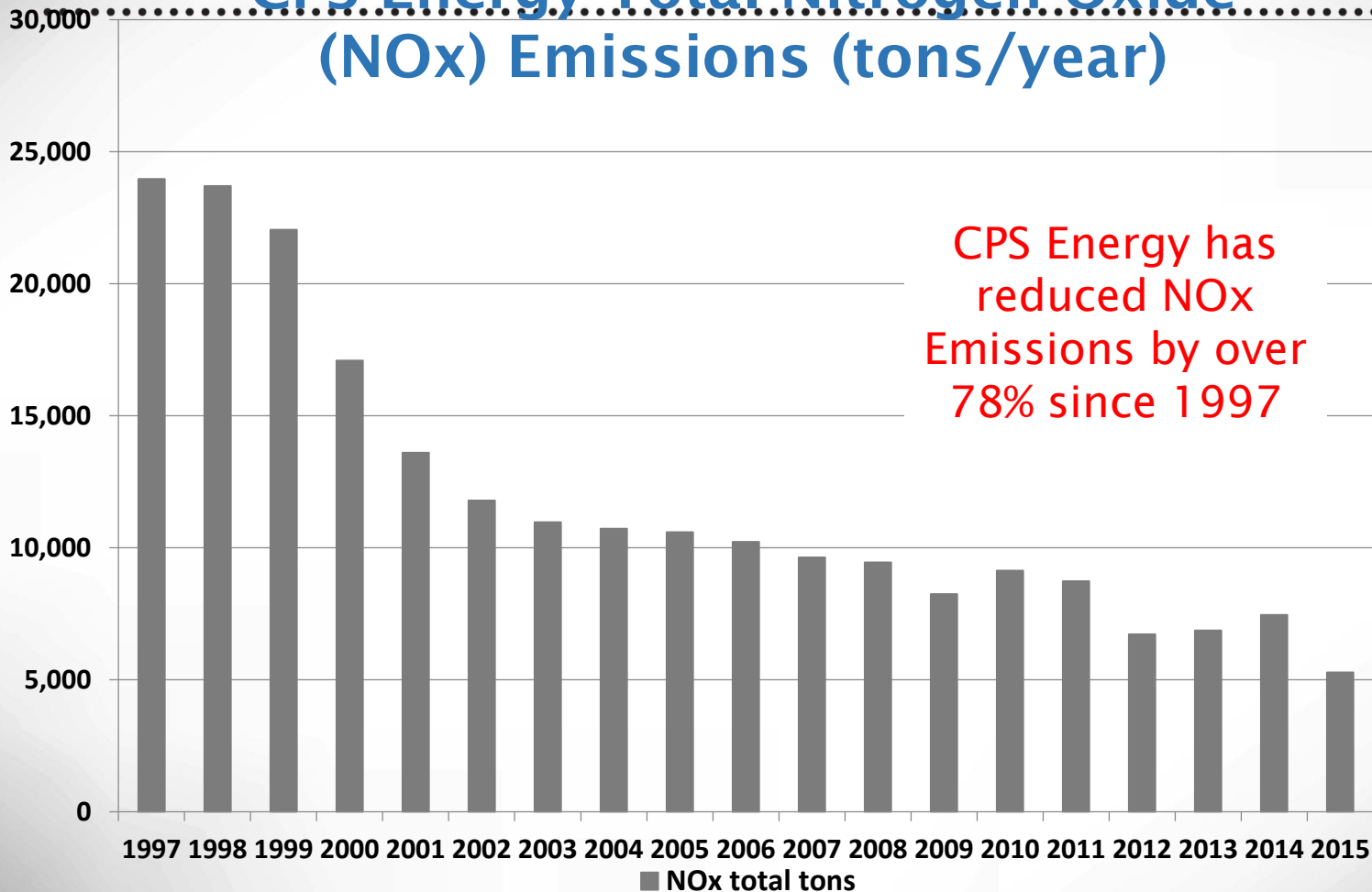


Numerical Ranking of Units - Worst to Best



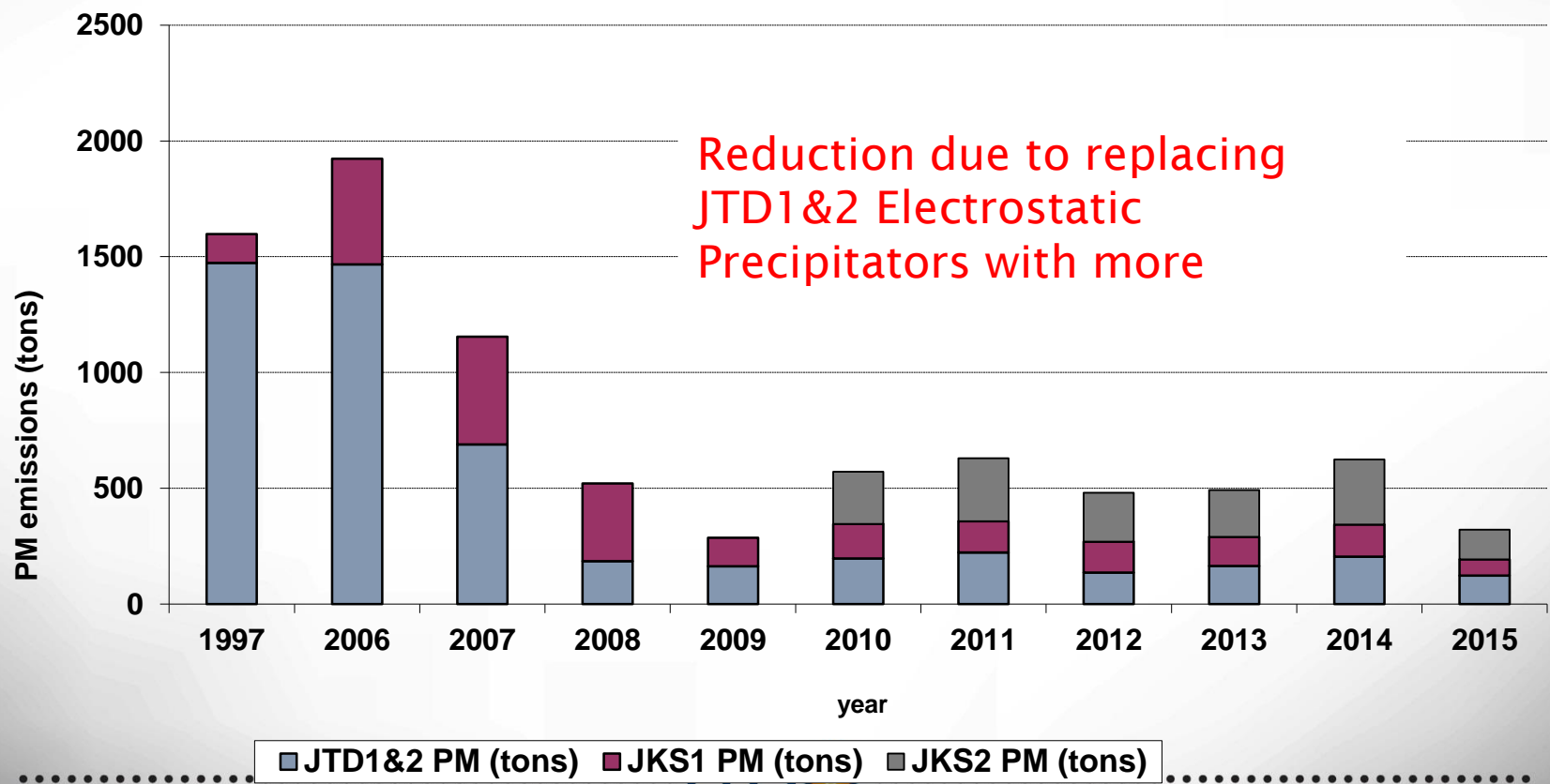
# NOx REDUCTION

## CPS Energy Total Nitrogen Oxide (NOx) Emissions (tons/year)



# PARTICULATE MATTER REDUCTION

## CPS Energy Coal Unit Particulate Matter (PM) Emissions



# SO<sub>2</sub> REDUCTION

CPS Energy Total Sulfur Dioxide (SO<sub>2</sub>) Emissions (tons/year)

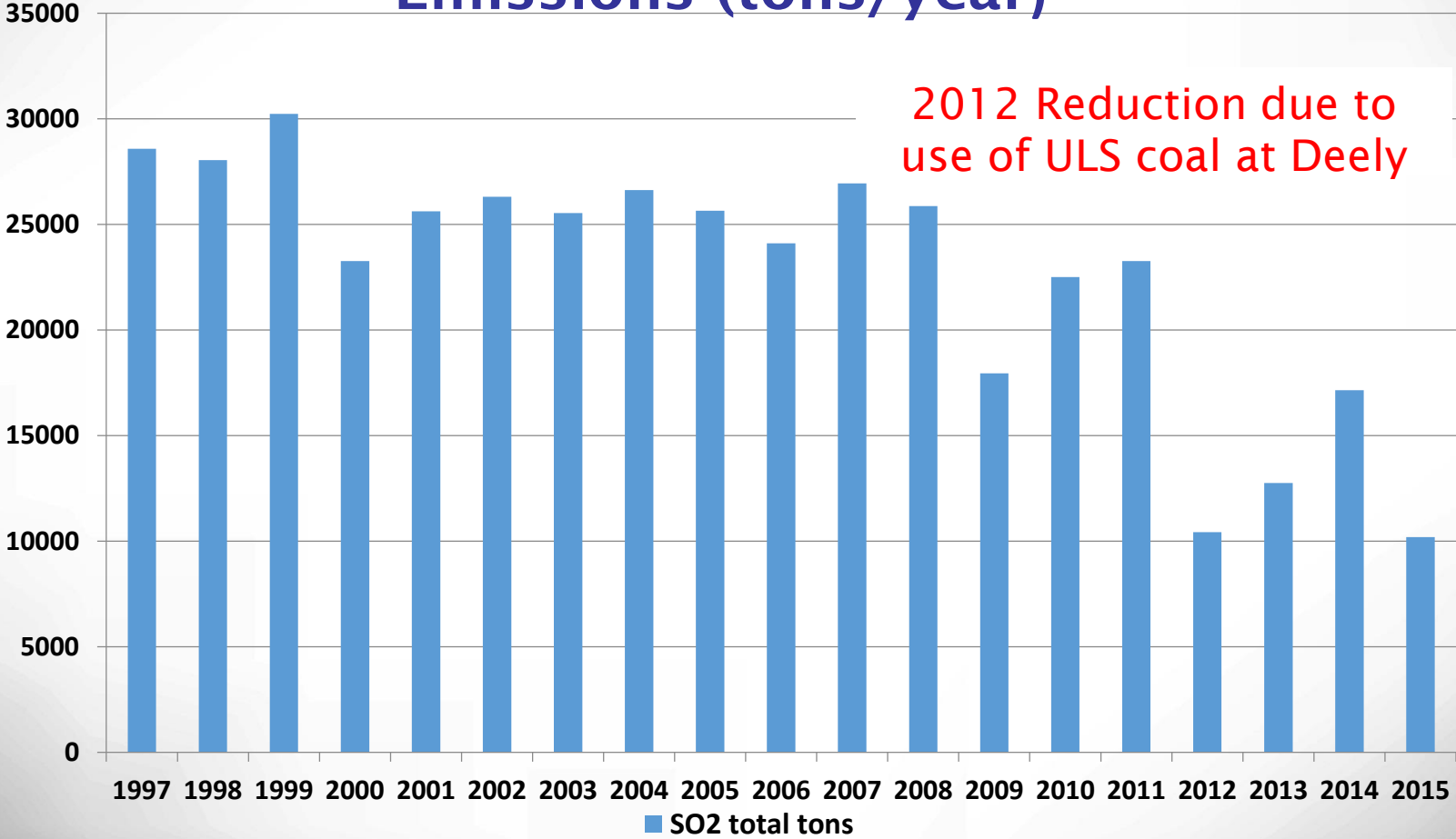




Photo courtesy of OCI Solar

# QUESTIONS?