

The Utility Sector as a Climate Solutions Provider

Harnessing Energy Efficiency

November 1, 2017

2017 ACEEE National Conference on Energy Efficiency as a Resource



Together, Building
a Better California



About PG&E

PG&E is focused on providing safe, reliable, affordable and clean energy to nearly 16 million Californians.



24,000
employees

5.3 million
electric
customers

~70%
GHG-free energy

70,000
square mile
service area

4.4 million
gas distribution
customers

7,700
MW of owned
electric generation
capacity



Together, Building a Better California

Corporate Responsibility and Sustainability Report

2017

For PG&E, sustainability is about meeting the needs of today in a way that creates a *better* tomorrow.

Message from Geisha Williams
CEO and President

www.pgecorp.com/sustainability



Projected climate change impacts

5-24 inches of potential sea-level rise by 2050

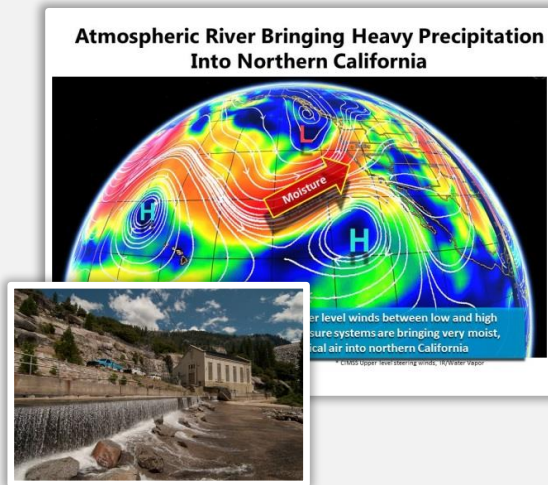
24 inch increase shown with affected PG&E electric substations



Source: Range values taken from California Coastal Commission Sea Level Rise Guidance, August, 2015.

Inconsistent and extreme precipitation

2016 saw drought and severely reduced hydroelectric output, but in 2017, California has received above-normal precipitation



Sea level winds between low and high pressure systems are bringing very moist, cool air into northern California

More hot summer days projected for Central Valley by 2050

	High Emission Scenario	Low Emission Scenario
Decade Ending	Modeled # Days $\geq 100^{\circ}\text{F}$	Modeled # Days $\geq 100^{\circ}\text{F}$
2020	12	13
2030	14	10
2040	18	19
2050	21	17
2060	24	18
2070	28	26
2080	37	20
2090	47	26
2100	57	27

Source: Cal-Adapt on-line database for Central Valley location with a 98% (4 days per year) maximum temperature of 100 degrees Fahrenheit relative to a 1961–1990 May–October baseline.

200% increase in non-urban areas burned by wildfire by 2050 vs. 1961-1990 average



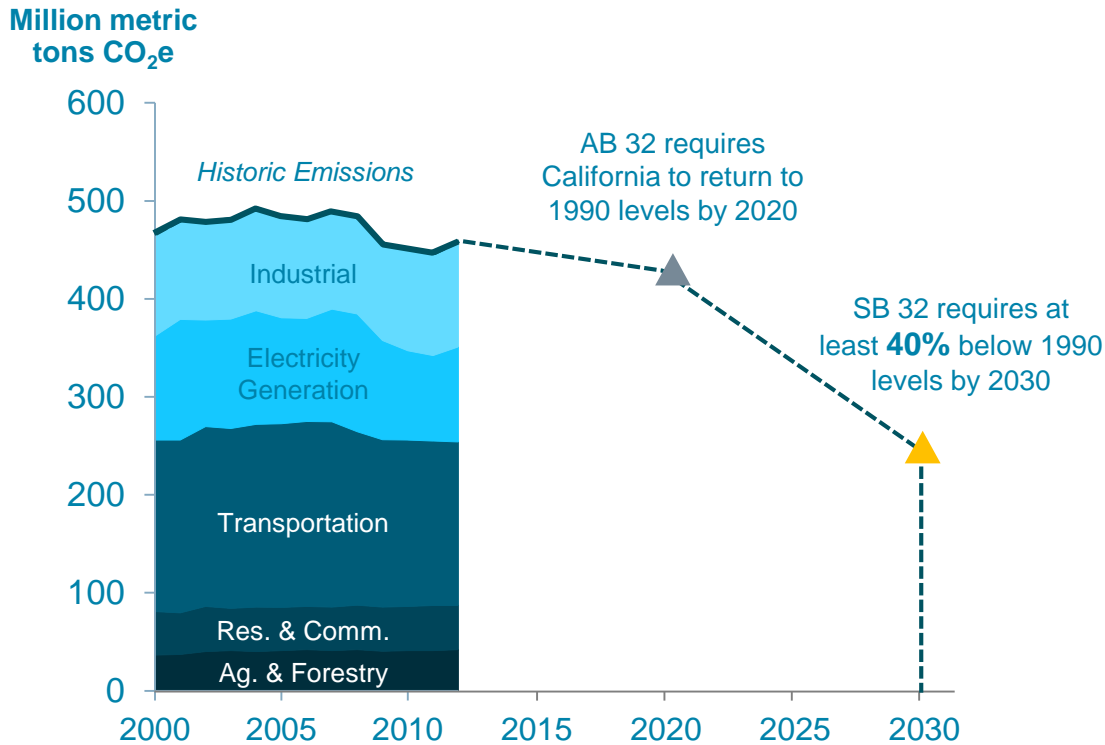
Source: Scenarios to Evaluate Long-Term Wildfire Risk in California: New Methods for Considering Links Between Changing Demography, Land Use, and Climate. California Energy Commission.

PG&E is working to understand the impacts of climate change on our business and prepare for disruptions to service driven by changing climate conditions and extreme weather.



California's climate goals

California Greenhouse Gas Reduction Goals and Historic Emissions*



California is Targeting:



50%
renewables by
2030



1.5M
electric vehicles
by 2025



2X
energy efficiency
in existing
buildings by 2030

PG&E is a partner in achieving California's clean energy goals.



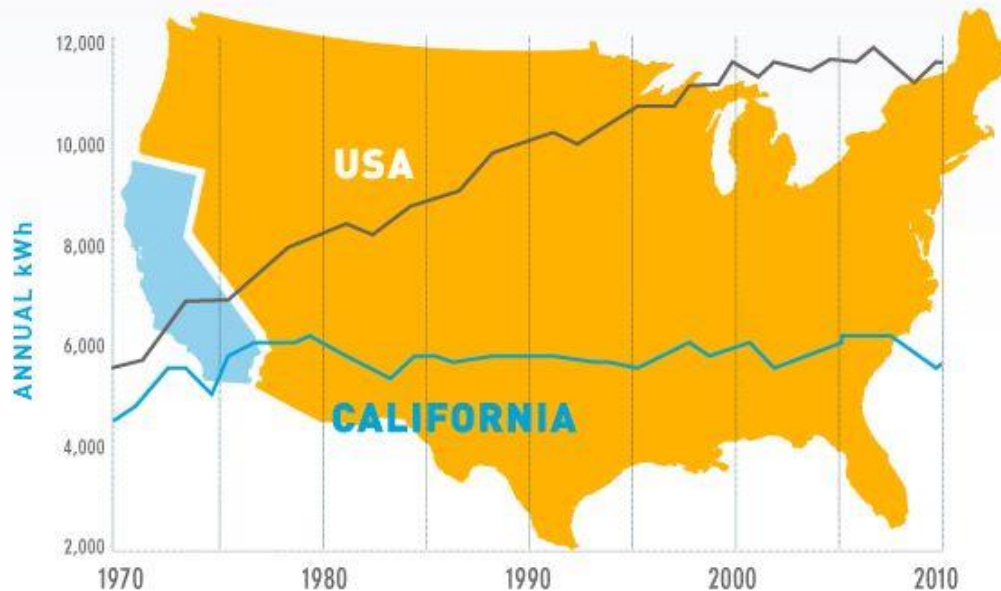
Strong business case for energy efficiency



PG&E's commitment to energy efficiency begins with our customers.

California: energy efficiency a long-held priority

PER CAPITA ELECTRICITY CONSUMPTION



(Source: US Energy Information Administration)

California's energy efficiency model:

- "Loading order," which prioritizes energy efficiency
- Decoupling gas and electric profits from energy sales
- Programs, training and strong customer participation
- Aggressive building codes and appliance standards

PG&E's approach:

- Comprehensive portfolio to reach all customers
- Codes and standards, and emerging technologies
- Workforce education and training
- Integration as a cost-effective grid resource

In California, energy efficiency has helped keep the state's per capita electricity consumption nearly flat since the 1970s, saving customers billions of dollars. PG&E customers saved \$258 million through energy efficiency in 2016.



California: energy efficiency results

DECREASES POLLUTION

- ▶ Avoided at least **30** LARGE POWER PLANTS since 1970s, 11 more expected to be avoided over the next decade 
- ▶ Cuts MILLIONS OF TONS OF POLLUTANTS contributing to asthma, other ills

CUTS ENERGY WASTE

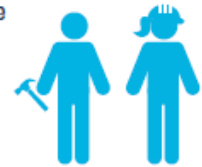
- ▶ Saved enough electricity since 2003 to power **MORE THAN HALF OF CALIFORNIA'S HOMES FOR ONE YEAR** 
- ▶ Met about 1/5 of the state's electricity need in 2013
- ▶ Helped keep per capita electricity use flat vs. 50% increase in rest of U.S. (since 1970s)

SAVES CALIFORNIANS MONEY

- ▶ Efficiency programs saved \$12 billion after costs (2003-2013)
 - ▶ Research projects yielded \$446 for every \$1 invested
 - ▶ Newest building codes to save \$6,000 per house
- ▶ Codes and standards saved a total of **\$75 billion** (since 1970s)

CREATES JOBS, SPURS ECONOMY


- ▶ Efficiency jobs grew 15% compared to 2% economy-wide (2002-2012)
- ▶ California produces 2x benefit for every unit of electricity compared to the rest of U.S.



HELPS LOW-INCOME CUSTOMERS

- ▶ Low-income efficiency programs served almost **3 MILLION HOUSEHOLDS** (since 2003)
- ▶ Saved enough electricity to power **90,000 HOMES** and enough natural gas for nearly **80,000 HOMES** for 1 year

HELPS MEET CLIMATE GOALS

- ▶ Slashed **30 MILLION** metric tons of CO₂ pollution, equal to annual emissions of 6 MILLION cars (since 2003) 
- ▶ Cuts one of the largest sources of California's greenhouse gas emissions



NATURAL RESOURCES DEFENSE COUNCIL



Sectors

- *Five Customer Groups:* Residential, Commercial, Industrial, Agricultural, Public
- *Cross-Cutting Groups:* Codes and Standards, Emerging Technologies, Workforce Education and Training, Finance

Programs

- Scalable strategies for targeted customer savings

Platforms

- Measure, pay for, and claim energy savings

Enablers

- Customer Analytics, Sales and Marketing, Evaluation



PG&E offers a comprehensive energy efficiency portfolio to reach all customers.



Water-energy nexus



PG&E's customers saved about 780 million gallons in 2016 through energy efficiency.



Empowering workforce opportunities

PG&E's approach to workforce education and training

- Teach the energy workforce to recognize energy saving opportunities
- Provide the energy workforce skills, tools, and resources to act upon those opportunities

PG&E services and resources

- Technical training on energy and sustainability
- Building diagnostics tools
- Technical resources and advice



2016 Highlights

- 340 training sessions
- 1,400+ technical consultations

PG&E is working to build a skilled energy workforce capable of meeting California's energy savings goals.



Step Up and Power Down

STEP UP AND
POWER DOWN



Community Partnerships

San Francisco, San Jose

18 Months

May 2015 – Dec 2016

1,275 Businesses

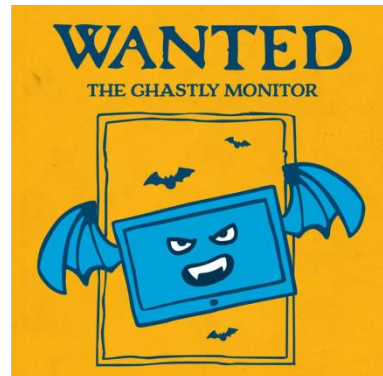
Pledged to Step Up and Power Down

Energy Savings

50+ million kWh

\$2.5 Million

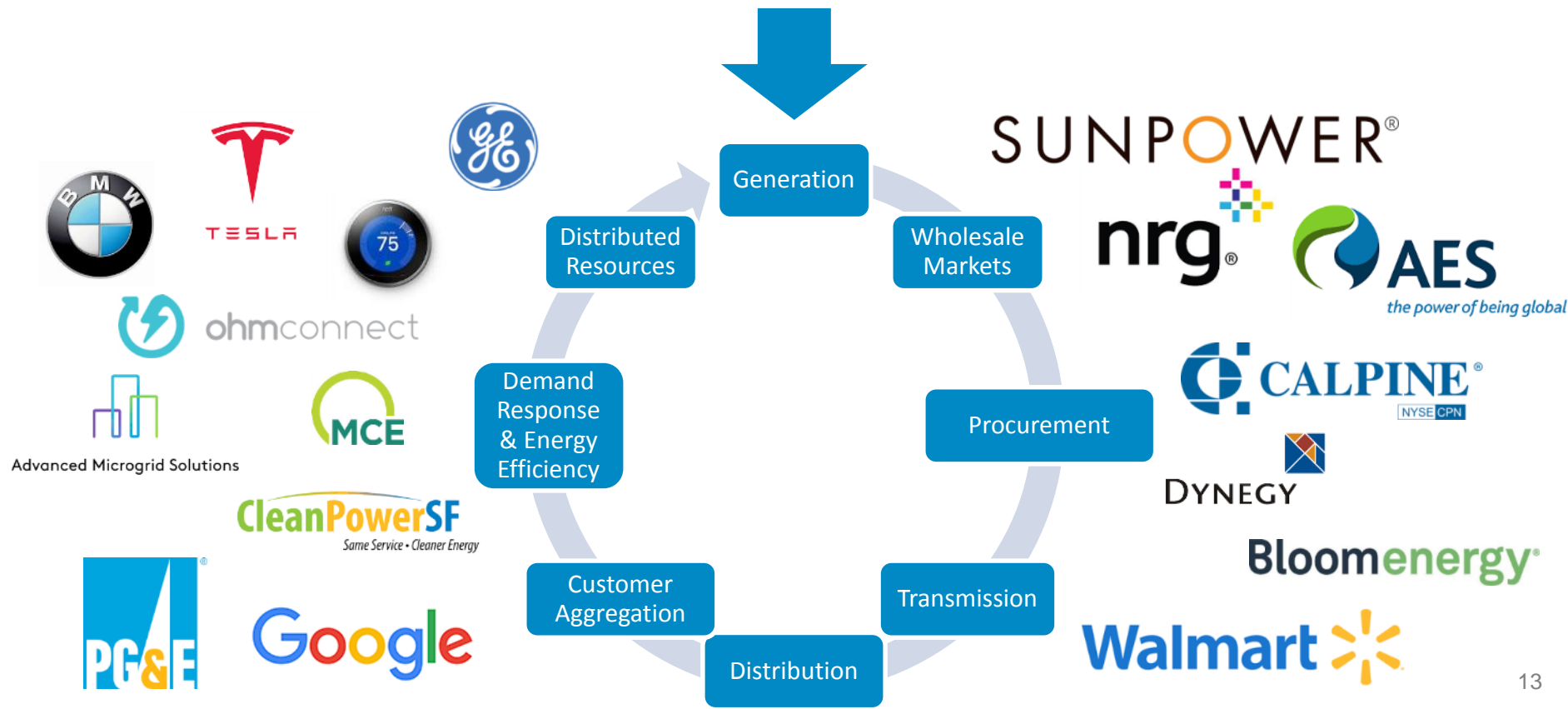
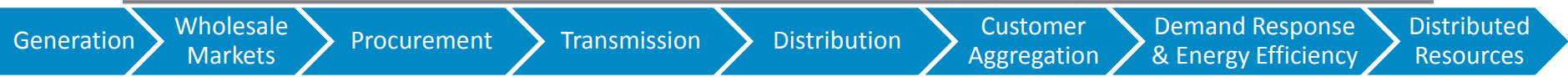
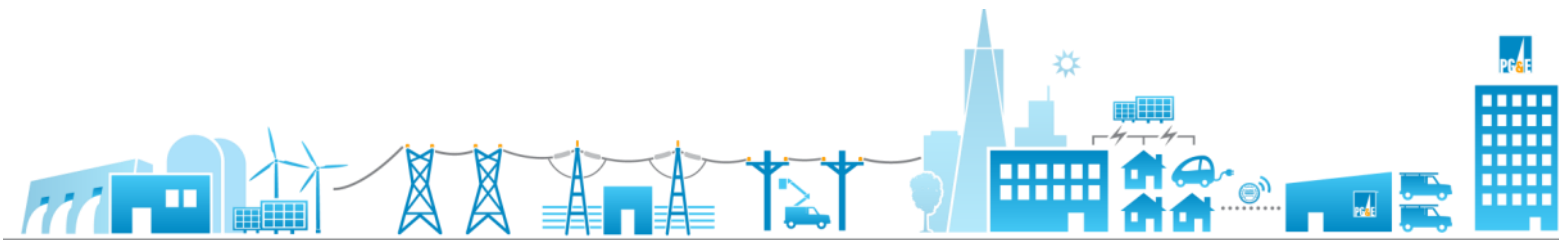
Awarded to the cities for achieving their goals



A community-based movement to reduce energy waste



The energy landscape is transitioning to a more distributed and dynamic future



Targeted demand side management

- Integrate high penetrations of distributed energy resources—including energy efficiency—into PG&E’s electric distribution planning and operations
- Explore distributed energy resources as an alternative to capital investment at electric distribution feeders



PG&E is working to integrate energy efficiency as a cost-effective grid resource with other distributed energy resources.

Importance of collaboration



Collaboration is key to achieving a sustainable energy future.