

SUNRISE FROM THE WEST: SB 100 Implementation



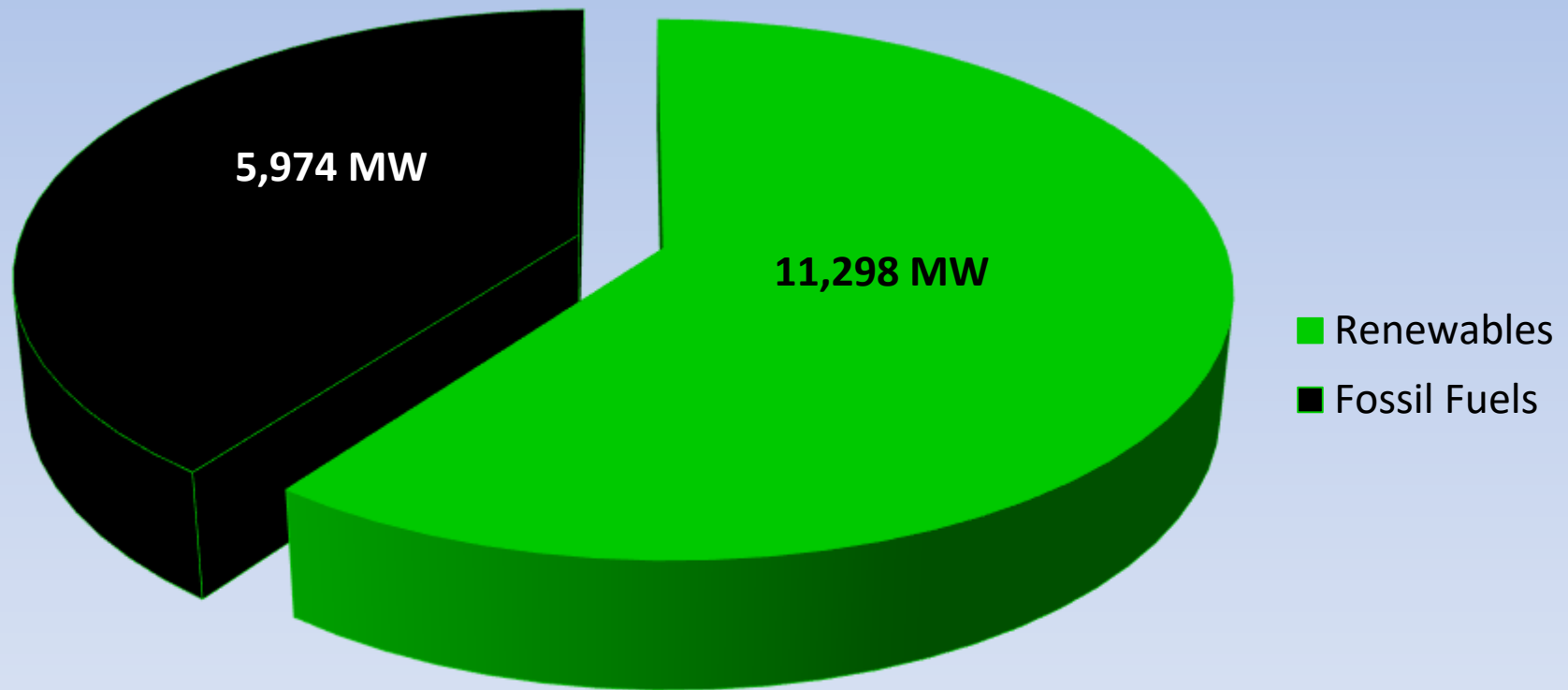
**David Hochschild
Chair
California Energy Commission**

World's 5 Largest Companies Have Committed to 100% Renewable Energy



Most of the New Generation Added to the Grid is Renewable Energy

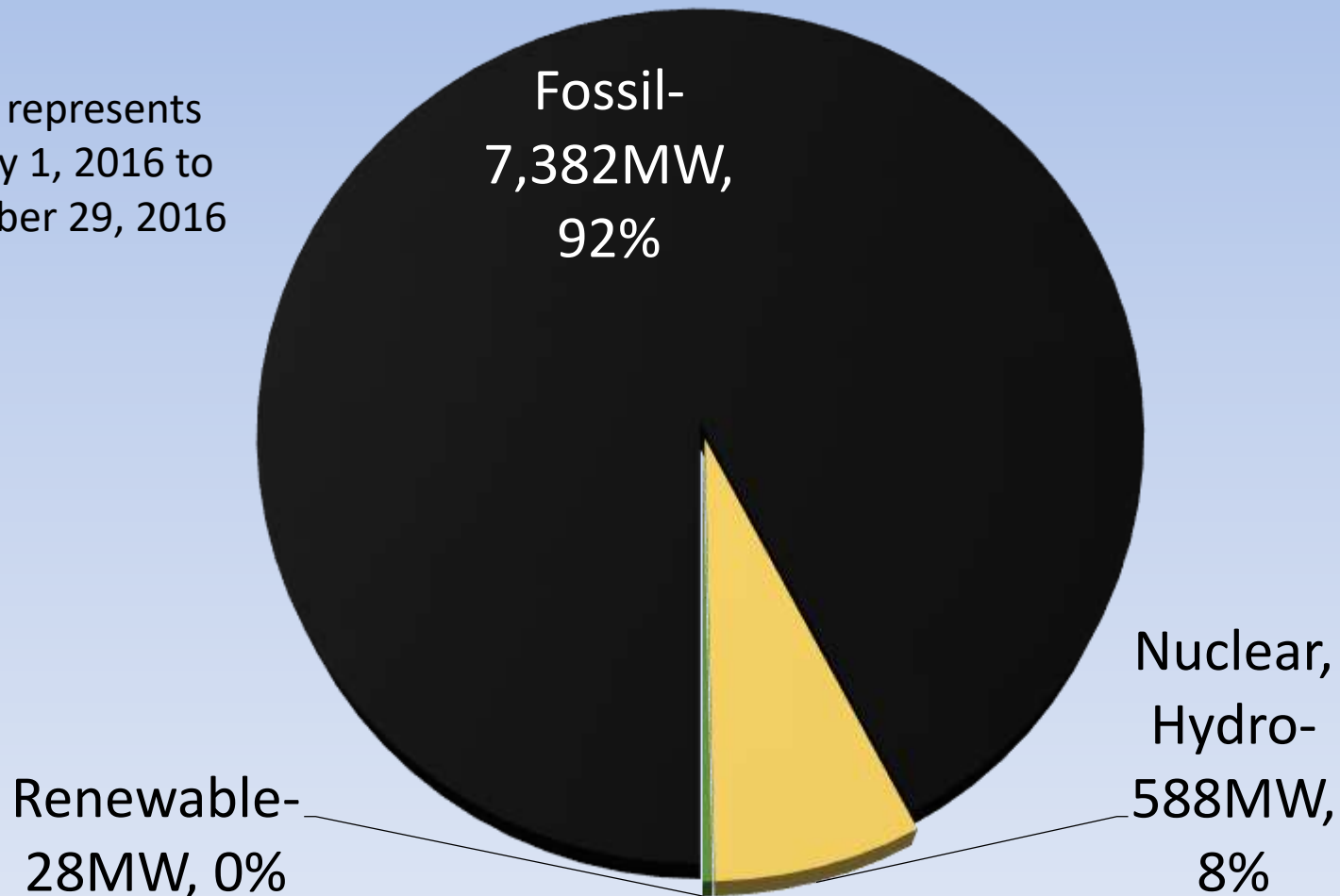
Renewables = 65% of New US Electric Generation Capacity



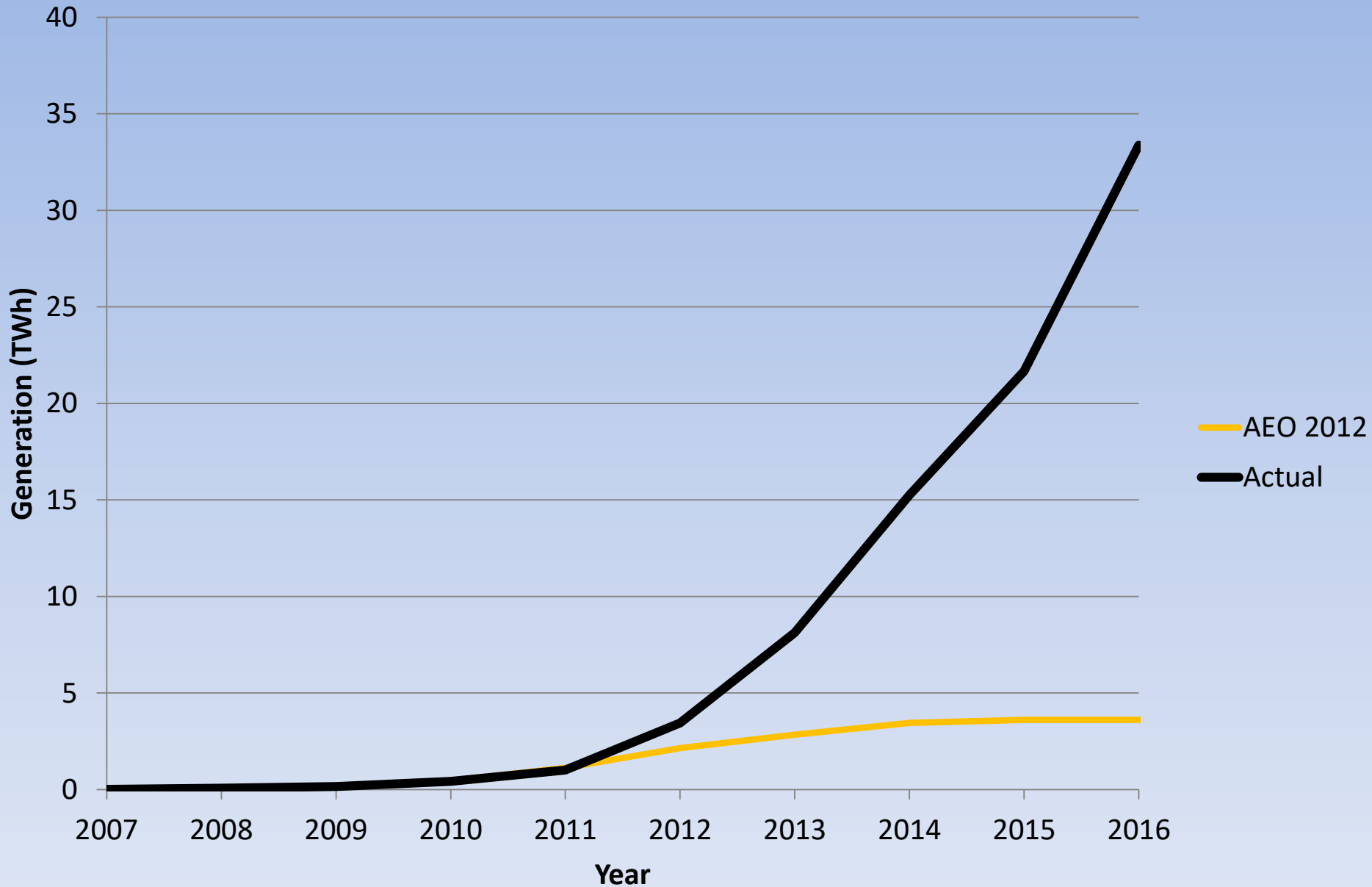
Most of the Retirements are Fossil Energy

Fossil fuels = 92% of Retired US Electric Generation Capacity in 2016*

*Data represents
January 1, 2016 to
November 29, 2016

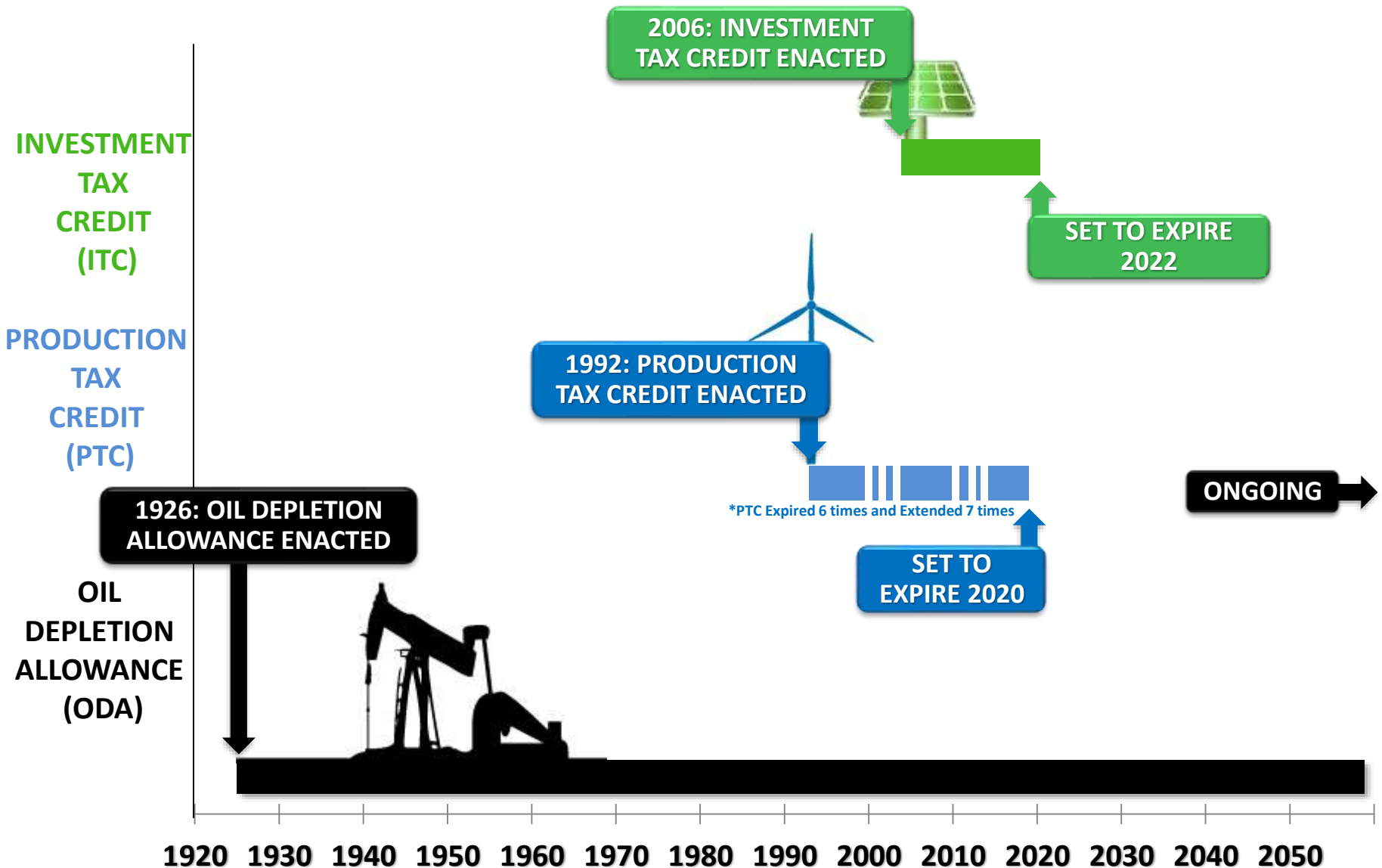


US Solar PV Generation

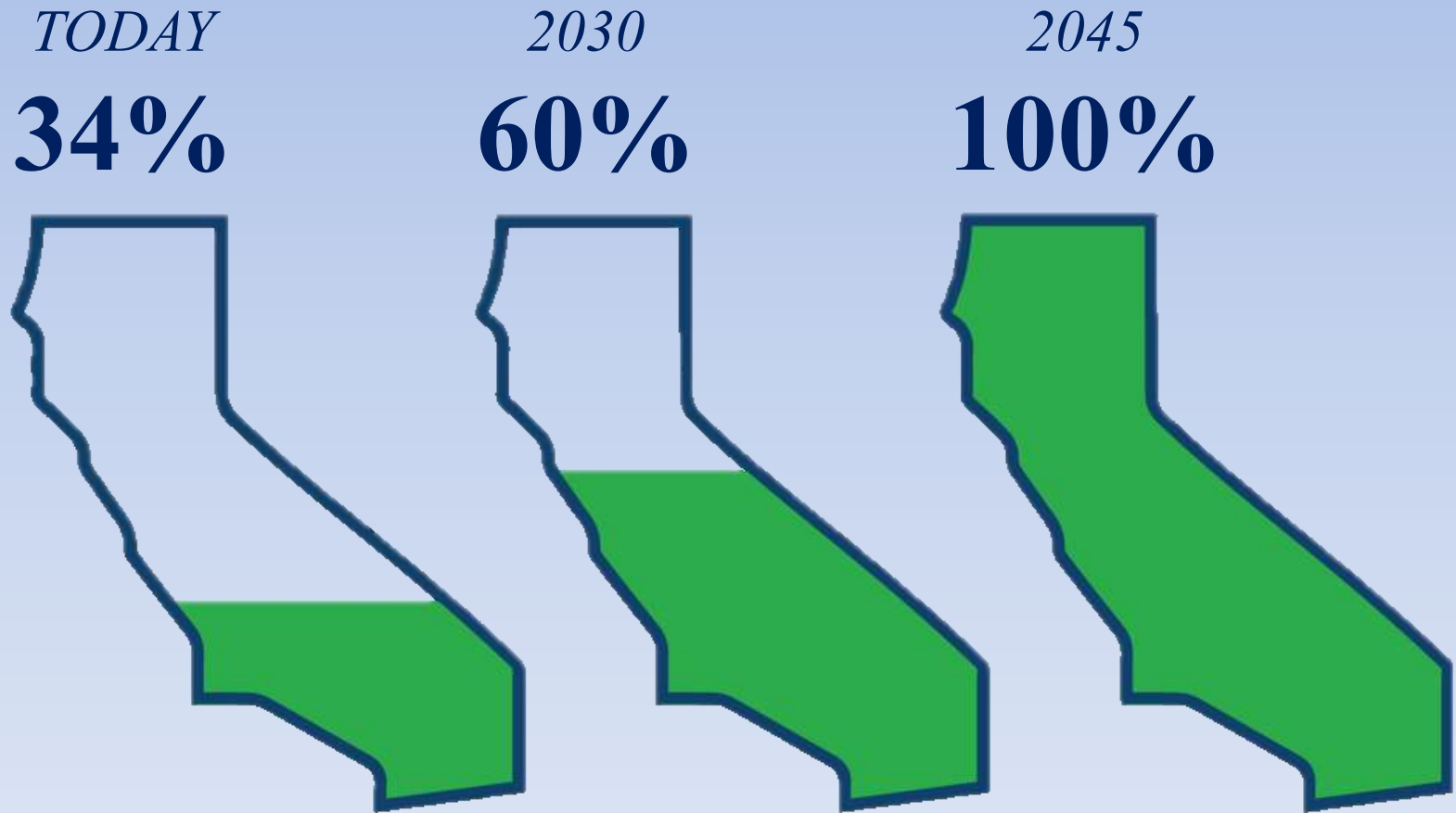


Source: EIA *Annual Energy Outlook* 2004-2017, EIA *Electric Power Monthly* July 25, 2017

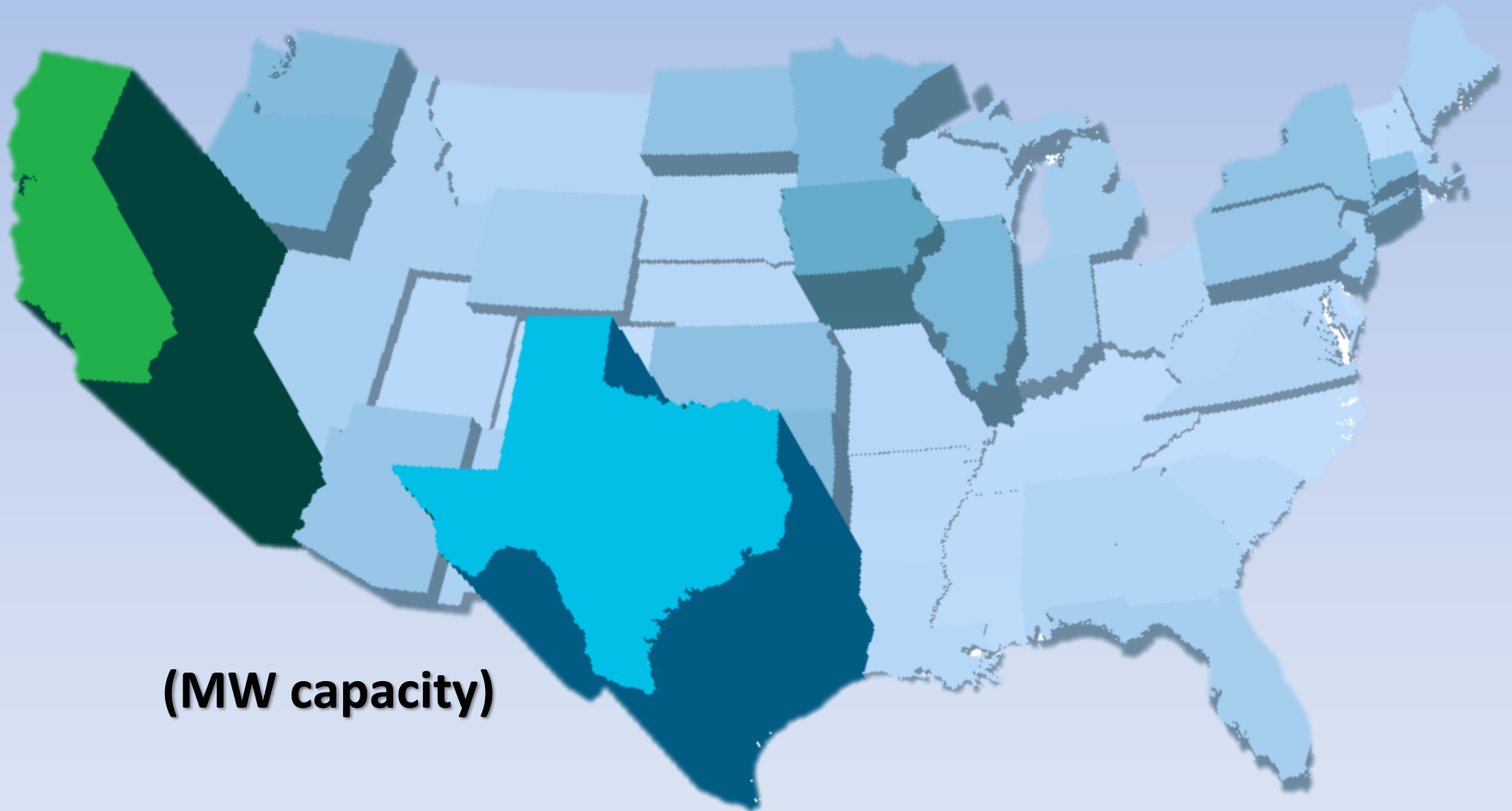
Federal Energy Subsidies



California Moves to 100% Clean Energy by 2045



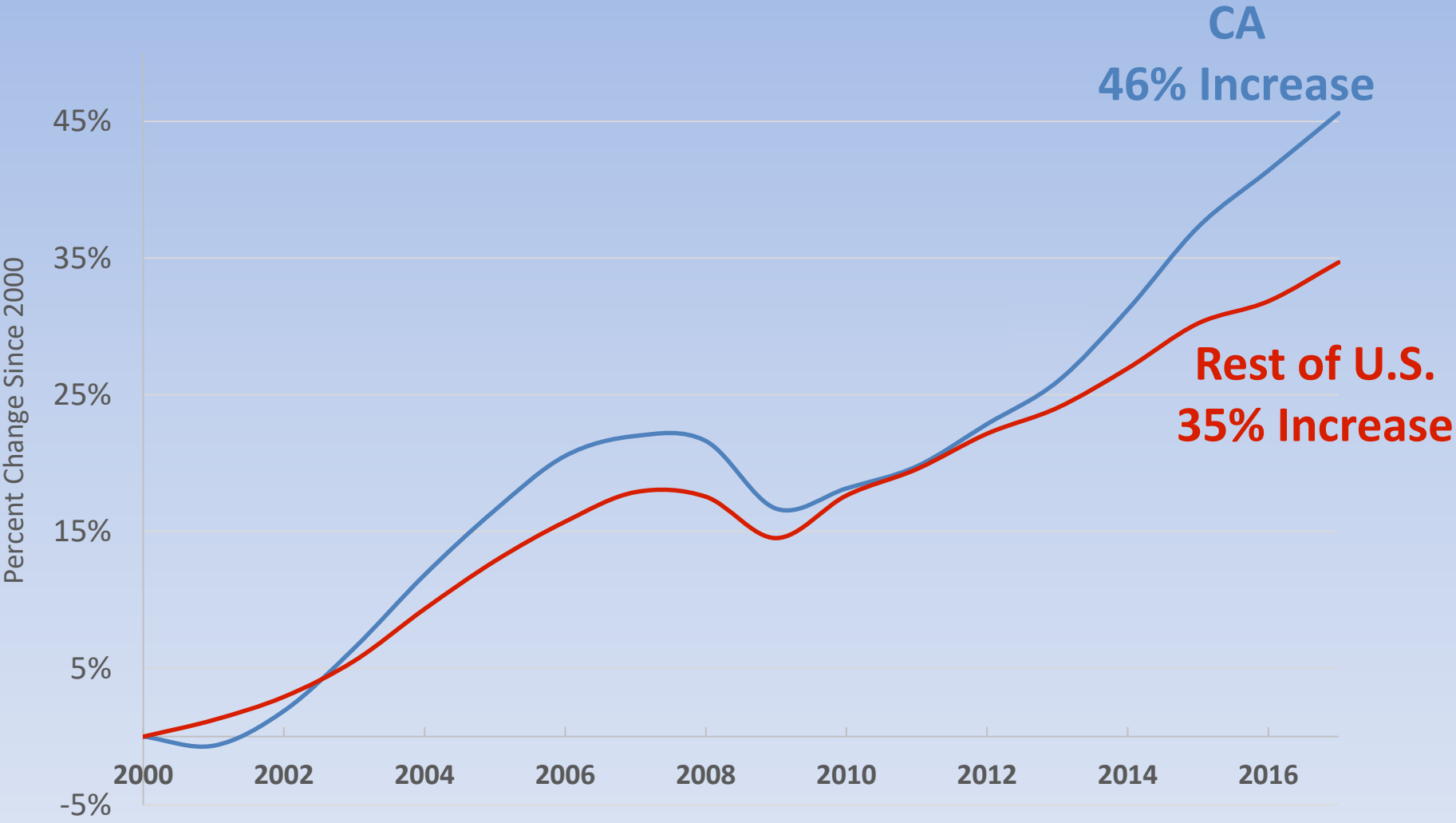
California Leads the US in Renewables Installed. What lessons have been learned?



(MW capacity)

Source: Graphics based on data from the American Council On Renewable Energy (ACORE)
Renewable Energy in the 50 States (2013/2014 Editions)
<http://www.acore.org/publications/50states/>

California's GDP is growing faster than the Nation's



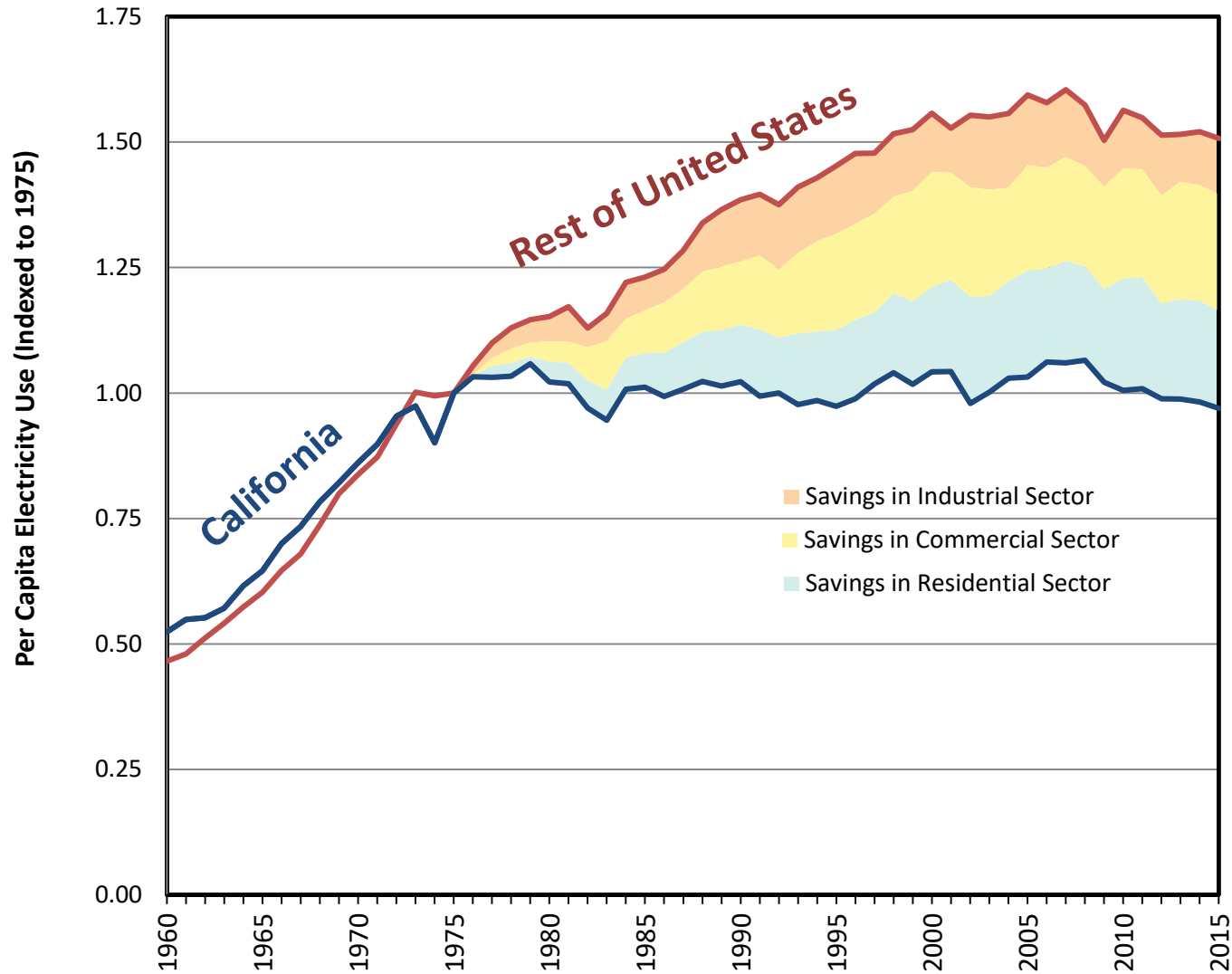
Source: U.S. Bureau of Economic Analysis, California Department of Finance, Real GDP by state (millions of chained 2009 dollars)

California Unemployment Falls to 4%



Source: “Unemployment Rate and Labor Force Data Table,” State of California Employment Development Department, Jan 22, 2018. <http://www.labormarketinfo.edd.ca.gov/data/unemployment-and-labor-force.html>

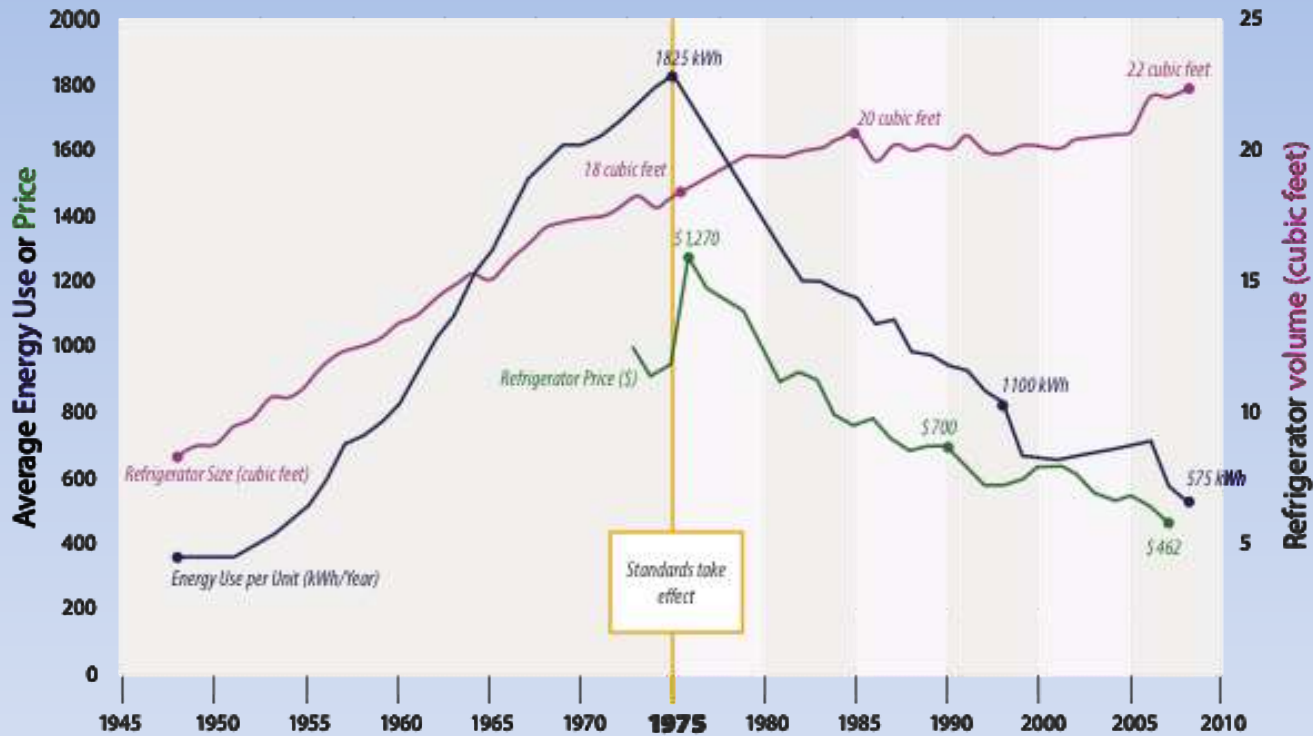
California Advancing Energy Efficiency



Source: EIA, SEDS database (2017)

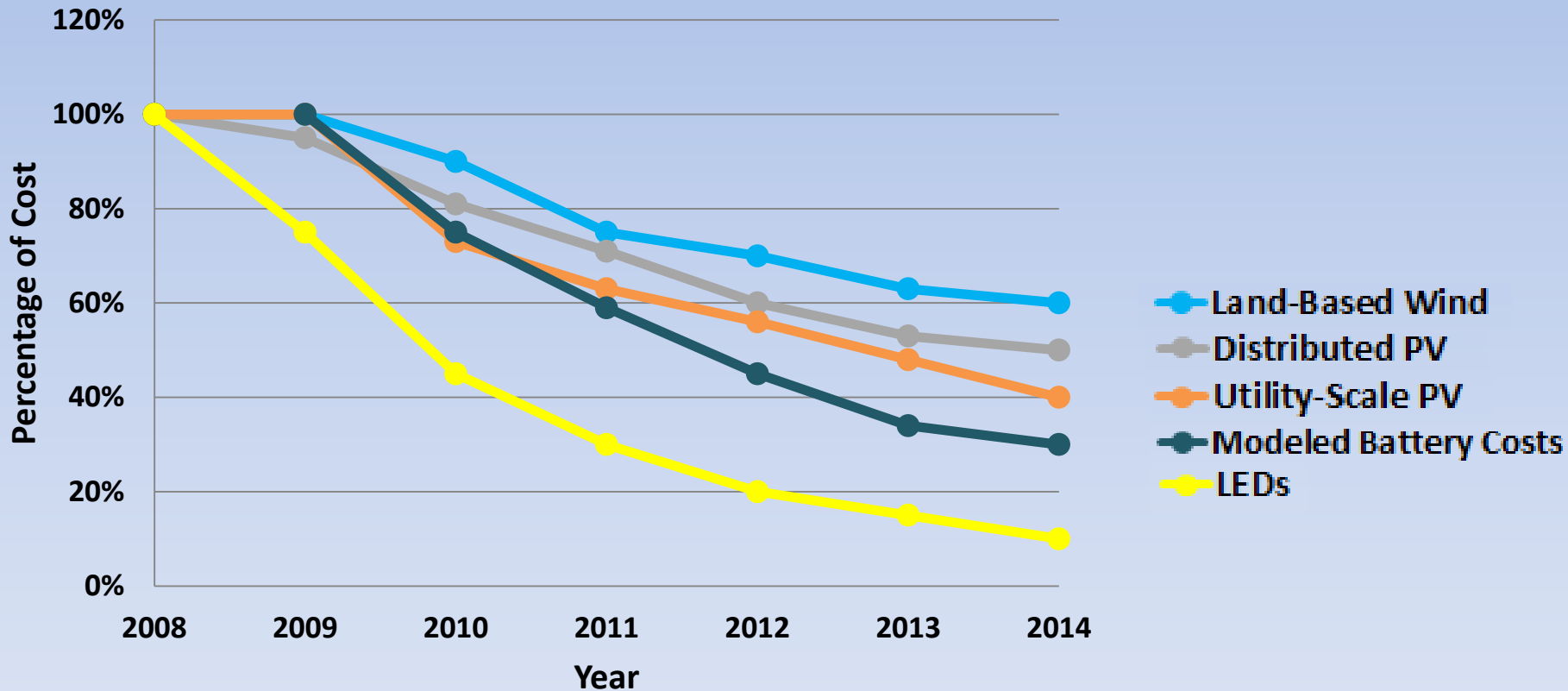
California Advancing Energy Efficiency

New Refrigerator Use v. Time and Retail Prices



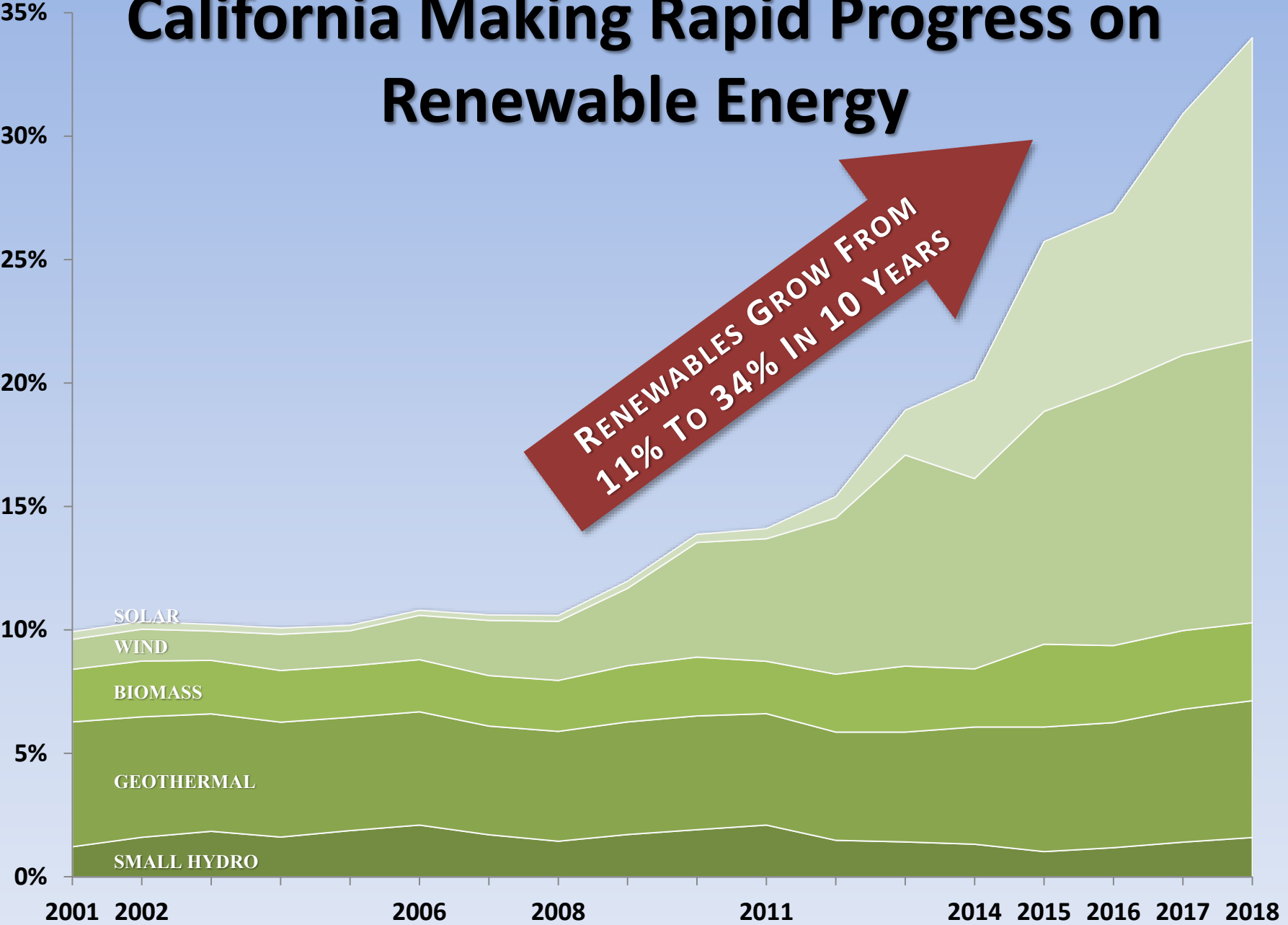
The Falling Cost of Clean Energy Technologies

Indexed Cost Reductions Since 2008



Source: DOE Report, Revolution Now, The Future Arrives for Five Clean Energy Technologies, 2015

California Making Rapid Progress on Renewable Energy



RENEWABLES GROW FROM 11% TO 34% IN 10 YEARS

The World's Largest Wind Project

Alta Wind Energy Center
1550 MW
Kern County, CA



The World's Largest Geothermal Power Plant

Geysers Geothermal Power Plant
955 MW
Lake County, CA



The World's Largest Thin Film Solar PV Project

An aerial photograph showing a vast, rectangular solar farm in a desert. The solar panels are arranged in a grid pattern, with a central vertical aisle and several horizontal aisles. The surrounding landscape is arid and hilly, with some sparse vegetation and dirt roads. The solar panels appear as a dark blue grid against the light-colored desert floor.

**Desert Sunlight Solar
Project
550 MW
Riverside County, CA**

The World's Largest Solar Thermal Power Plant (Tower)

Ivanpah Solar Thermal Project
393 MW
San Bernardino County, CA



The World's Largest Solar Thermal Power Plant (Trough)

Solar Energy Generating System (SEGS)

354 MW

San Bernardino County, CA



World's Largest Solar Rooftop

Apple HQ
Cupertino, CA
17MW



World's 2nd Largest Lithium-Ion Battery Storage Project



Escondido Storage Project
120 MWh
San Diego, CA

California Leads the Nation in Biomass Energy Generation

Honey Lake Biomass Plant
Lassen County, CA

Offshore Wind: CA's New Renewable Resource?

Rhode Island's 30MW Deepwater Wind Project is the first offshore wind project completed in the US.



Largest Manufacturing Plant in CA Produces Electric Vehicles

Tesla employs 45,000
people



Tesla Factory
Fremont, CA



**627,000
ELECTRIC VEHICLES
IN CALIFORNIA
TODAY**

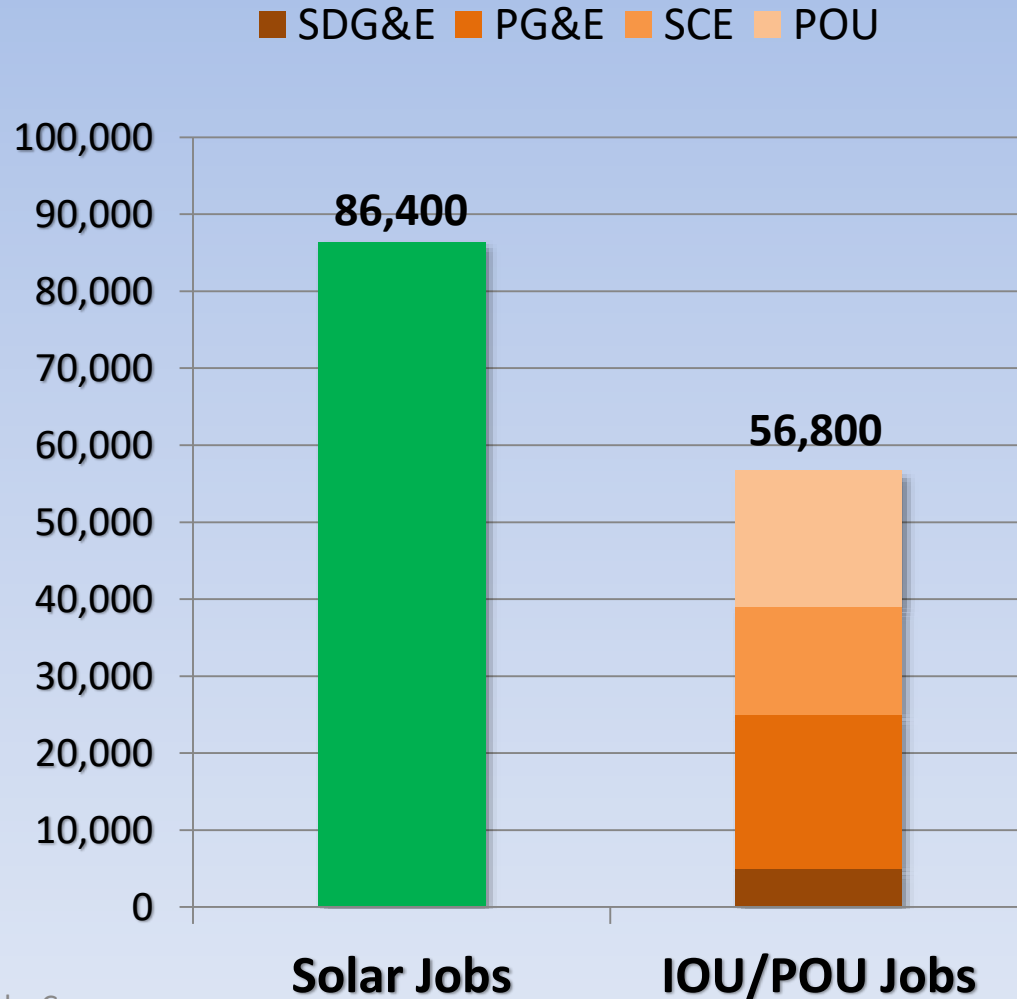
Tesla Inc.'s Model 3 plug-in electric car is the third most-purchased vehicle in the state

CA Vehicle sales, first half of 2019

1. Honda Civic	39,000
2. Toyota Camry	33,600
3. Tesla Model 3	33,000
4. Ford F-series	25,000



More Californians Work in the Solar Industry Than for All Utilities Combined



Sources:

Solar Foundation, 2017 Solar Jobs Census

U.S. Securities and Exchange Commission, Form 10-K, 2014

<http://www.sec.gov/edgar/searchedgar/companysearch.html>

2019: CA Reaches 1 M Solar roofs

2020: Solar Required for all New Homes



Zero Energy Community
Rocklin, CA



Electrification is Rapidly Expanding



Stanford University Converts Space and Water Heating from Natural Gas to Electricity



**Reduces water use and GHG emissions by $\frac{2}{3}$
and annual energy bills by $\frac{1}{3}$**

Now Selling: The All-Electric Home



CityVentures all-electric homes
Bellflower, CA

High Speed Rail is Coming to California and it will be 100% Powered by Renewables...



FOSSIL FUEL DECLINE: ONLY ONE OIL COMPANY REMAINS IN THE TOP TEN LIST COMPANIES....

1978	1988	1998	2008	2018
General Motors \$3337.5M	IBM \$5258.0M	General Motors \$178.17B	Exxon Mobil \$466.28B	Walmart \$500.34B
IBM \$2719.4M	Exxon Mobil \$4840.0M	Ford Motors \$153.62B	Walmart \$378.48B	Exxon Mobil \$244.36B
Exxon Mobil \$2423.0M	Ford Motors \$4625.0M	Exxon Mobil \$122.38B	Texaco \$267.64	Berkshire Hathaway \$242.14B
Ford Motors \$1672.8M	Texaco \$4407M	Walmart \$119.30B	Conoco Phillip \$246.18B	Apple \$229.23B
General Electric \$1088.2M	General Motors \$3551.0M	General Electric \$90.84B	General Electric \$181.58B	UnitedHealth \$201.16B
Chevron \$1016.4M	General Electric \$2915.0M	IBM 78.51B	General Motors \$148.98B	McKesson \$198.53B
Mobil \$1004.7M	AT&T \$2044.0M	Chrysler \$61.15B	Ford Motors \$145.11B	CVS Health \$184.77B
Texaco \$930.8M	DuPont \$1786M	Mobil \$59.98B	AT&T \$124.03B	Amazon.com \$177.87B
Gulf Oil \$752.0M	Chrysler \$1290M	Altria Group \$56.11B	Bank of America \$75.70B	AT&T \$160.55B
Chrysler \$163.2M	Mobil \$1258M	AT&T \$53.26B	Citigroup, Inc. \$51.60B	General Motors \$157.31B

Source: Forbes Fortune 500 list, top ten companies by revenue

CALIFORNIA CLEAN JOBS

California has

5x

more clean energy jobs
than fossil fuel jobs.

Nearly

4 in 10

solar jobs in America
are in California.

Statewide, there were

512,934

jobs in the clean
energy industry in 2018.

Thank you



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