SUNRISE FROM THE WEST: SB 100 Implementation

David Hochschild
Chair
California Energy Commission
Nearly 30% of Americans Live in a Community that is Going to 100% Clean Energy
World’s 5 Largest Companies Have Committed to 100% Renewable Energy

- Google
- Apple
- Facebook
- Microsoft
- Amazon
Most of the New Generation Added to the Grid is Renewable Energy
Renewables = 65% of New US Electric Generation Capacity

Source: FERC Energy Infrastructure Update, January-December 2015
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

Fossil-7,382MW, 92%
Nuclear, Hydro-588MW, 8%
Renewable-28MW, 0%

US Solar PV Generation

Federal Energy Subsidies

- **Oil Depletion Allowance (ODA)**
  - 1926: Enacted

- **Production Tax Credit (PTC)**
  - 1992: Enacted
  - Expired 6 times and Extended 7 times

- **Investment Tax Credit (ITC)**
  - 2006: Enacted
  - Set to expire 2022

Set to expire 2020

*PTC Expired 6 times and Extended 7 times*
California Moves to 100% Clean Energy by 2045

TODAY: 34%

2030: 60%

2045: 100%
California Leads the US in Renewables Installed. What lessons have been learned?

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’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%

California Advancing Energy Efficiency

Source: EIA, SEDS database (2017)

Per Capita Electricity Use (Indexed to 1975)

- California
- Rest of United States

Savings in Industrial Sector
Savings in Commercial Sector
Savings in Residential Sector

Source: EIA, SEDS database (2017)
California Advancing Energy Efficiency

New Refrigerator Use v. Time and Retail Prices

- Average Energy Use per Unit (kWh/Year)
- Refrigerator Size (cubic feet)
- Refrigerator Price ($)
- Standards take effect

- 1925 kWh
- 18 cubic feet
- $1,270
- 1975
- $700
- 1985
- $462
- 2005

- Refrigerator volume (cubic feet)


0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400
The Falling Cost of Clean Energy Technologies

Indexed Cost Reductions Since 2008

California Making Rapid Progress on Renewable Energy

Renewables grow from 11% to 34% in 10 years

Source: California Energy Commission, Tracking Progress Report
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

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
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 2/3 and annual energy bills by 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....

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<th>Year</th>
<th>Company</th>
<th>Revenue</th>
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<td>Citigroup, Inc.</td>
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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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