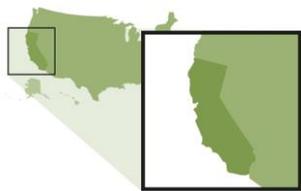




Partner region profile – California

Energy Transition Platform | May 2016

Socio-economic facts



California, United States

Population: 38,800,000 (2014) | **Area:** 423,970 km²

Landscape: diverse with forests (45% of area), mountains but also deserts; on Pacific Ocean

GDP: US\$2,31 trillion (2014) | **GDP/capita:** US\$59,574 (2014)

Economic sectors: 70% services | 20% industry: high-tech, bio-tech, aerospace, manufacturing | 3% agriculture (milk, almonds, grapes)

Jurisdictional power: highly decentralized

Key Energy Agencies: California Energy Commission, California Public Utilities Commission, California Independent System Operator

At the beginning of the 20th century, the economy of California was mainly based on agriculture, mining and railroads. After World War II and the Cold War, the defense sector suffered from severe cuts whereas electronics manufacturing initiated for war-related purposes rose significantly.

Innovation in computer science and software originated in Silicon Valley before spreading to the whole state. High-technologies more generally developed quickly in parallel. Today, the region represents a large share of the US economy and is home to the largest banks and businesses in the US¹. California's leading universities provide its prominent high-tech industry with highly qualified, skilled and educated workers, which helps explain California's dynamic and entrepreneurial spirit.

¹ <http://www.britannica.com/place/California-state/Economy>



This innovative spirit is also reflected in the advanced use of renewables². California's geography is incredibly conducive to solar, biomass, geothermal, hydro and wind power installations, while its powerful manufacturing sector and high-tech industry facilitate the development of such technologies.

Most of the population is located along the coast, in metropolitan areas. In fact, more than 75% of the state's population is located in Los Angeles, San Francisco and San Diego and their spreading suburban areas³.

Energy system and energy policy

California is leading not only the country but also the world in producing power from a diverse set of renewable energy resources. Its robust Renewables Portfolio Standard (RPS) requires electric utilities and other power providers to procure 50% of their annual electric retail sales from eligible renewable energy resources by 2030. This is an increase from the previous RPS of 33% by 2020.

By the end of 2014, nearly 25% of all electric retail sales were served by eligible renewable energy resources. Additional renewable capacity is planned, but further investments in the state's electric transmission and distribution systems will be needed to achieve the 2030 target.

Energy resources (in ground & production)	Produces crude oil (3 rd producer in the US) and natural gas. Also generates a significant amount of renewable energy
Energy mix: consumption by sources and sectors	Sources: mainly natural gas and crude oil, followed by renewables Sectors: transport (38%); industry (24%); households (19%); commercial (18.5%) ⁴
Renewable energy consumption	25% of electricity produced from renewable sources: wind power (39%); geothermal energy (21%); solar photovoltaic (PV) (19%); biomass (14%) ⁵
Imports/exports	Imports 1/3 of annual electricity consumption
Energy market structure (privatized/monopolized)	Hybrid (semi-competitive) wholesale and retail electric power markets. Natural gas supply open to competition

Clean Energy and Pollution Reduction Act of 2015 (Senate Bill 350)

This Senate Bill signed into law in October 2015 enhanced California's existing strategic framework to achieve its ambitious climate and clean energy targets. The bill requires the following:

- Electric utilities and power providers must procure at least 50% of their supply from eligible renewable energy resources by 2030;
- Targets must be developed for each electric and natural gas utility to achieve a cumulative doubling of statewide energy savings from all retail end-uses by 2030;

² ibid

³ <http://www.britannica.com/place/California-state>

⁴ <http://under2mou.org/wp-content/uploads/2015/05/California-appendix-English.pdf>

⁵ <http://www.eia.gov/state/?sid=CA#tabs-1>



- Transition away from petroleum-fueled vehicles to clean and zero-emission vehicles; and
- Foster the creation of a regional integrated electric system, where the intermittent influx from renewable energy resources is efficiently managed – to better balance surplus and scarcity.

Renewable Portfolio Standard (RPS)

The first RPS was adopted in 2002, with a 20% target of electricity to be supplied by eligible renewable energy resources by 2010. The target has been increased to 50% by 2030, as codified in SB 350, to reflect Governor Edmund G. Brown’s commitment to renewable energy resources announced in his 2015 State of the State Address.

The California Energy Commission is one of two agencies responsible for implementing the RPS by certifying whether renewable energy resources are eligible, among other things. The California Public Utilities Commission oversees the states investor owned electric utilities, authorizes each of these utilities RPS procurement approaches, approves RPS eligible contracts and decides on retail rate changes.

Energy transition experience

California is a great example of a thriving economy that has grown while simultaneously reducing its GHG emissions. This decoupling of economic growth with GHG emissions confirms California’s role as an energy transition leader.

Raising the state’s RPS, encouraging reductions in petroleum use for transportation and capturing more energy savings has already begun to show results. It is the first US State to generate more than 5% of its electricity from the sun⁶; it is driving innovation in energy storage technologies; and micro grid installations are booming all over the region, from university campuses to military bases.

Drivers behind this energy transition include a favorable geography, robust government policies, and the innovative and entrepreneurial spirit of businesses that understand the opportunities of low carbon investments. This in turn creates a stimulating environment for both businesses and civil society to take part in the energy transition. For example, the high-tech company Apple is planning to develop its “own grid-scale renewable energy project”⁷ that will provide enough power to meet the annual electricity needs of the company’s headquarters and stores throughout California.

Though California continues to successfully deploy renewable energy resources, it has come with its own set of challenges. Most of these challenges focus on integrating large amounts of power generated from intermittent and variable renewable energy resources such as solar PV and wind installations into the existing electric system. One solution has been to expand the state’s wholesale electric power market to neighboring states. This regional approach allows California and other states in the western US to buy, sell and balance power supply and demand over a larger geographic region, taking advantage of resources closer to where electricity is consumed.

Climate and energy targets:

Reduce GHG emissions to 1990 levels by 2020; below 1990 levels by 2030

Generate 33% of the electricity consumed from eligible renewable energy sources by 2020; 50% by 2030

Double statewide energy savings (electricity and natural gas) by 2030 for all retail end-use

Climate plan:

[AB 32 Scoping Plan](#)

⁶ <http://energytransition.de/2015/06/renewables-remake-californias-energy-landscape/>

⁷ *ibid*

Climate policy and instruments

The state of California has positioned itself as a leader in combatting climate change – attributed to its prominent government leadership, its dynamic high-tech industry as well as significant investments in renewable energy resources.

Despite growth in California’s population and economy, there has been a decrease in per capita GHG emissions between 2000 and 2012 from the industrial, transportation and electricity generation sectors.

Assembly Bill (AB) 32 – California Global Warming Solutions Act of 2006

The legislation passed in 2006 required California to reduce GHG emissions to 1990 levels by 2020, and directed the California Air Resources Board to develop a Scoping Plan describing the strategy to achieve this target. AB 32 has been recognized as the most comprehensive and long-term framework to combat climate change in the US.

AB 32 Climate Scoping Plan (updated in 2014)

This plan first developed by the California Air Resources Board in 2008 was updated in 2014 to reflect California’s 2030 GHG reduction goal and clean energy targets.

The plan identifies approaches to attract funding and low carbon investments and recommends a set of policy actions to reduce GHG emissions such as regulations, monetary incentives, market-based mechanisms and voluntary actions. Some of these policy actions include:

- Transportation: development of a Low Carbon Fuel Standard to decrease the carbon intensity of vehicle fuels by 10% by 2020;
- Cap-and-Trade Program: creation of a carbon market that establishes monetary value and a price for GHG emissions;
- Electricity and Natural Gas: increase in the RPS, financial incentives for distributed renewable energy resources and development of energy efficiency standards for buildings and appliances.
- Agriculture: more efficient fuel and water use; impact assessment of crops and livestock on productivity and GHG.

2009 California Climate Adaptation Strategy

This adaptation plan summarizes the impacts California is and will be facing with a changing climate, and recommends strategies to improve the state’s ability to withstand these impacts. These adaptation strategies are organized around seven sectors (Public Health, Biodiversity and Habitat, Ocean and Coastal Resources, Water Management, Agriculture, Forestry, and Transportation and Energy Infrastructure).

Contact

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Sources:

http://www.energy.ca.gov/renewables/renewable_links.html

<http://www.climatechange.ca.gov/>

<http://www.eia.gov/state/?sid=CA>

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