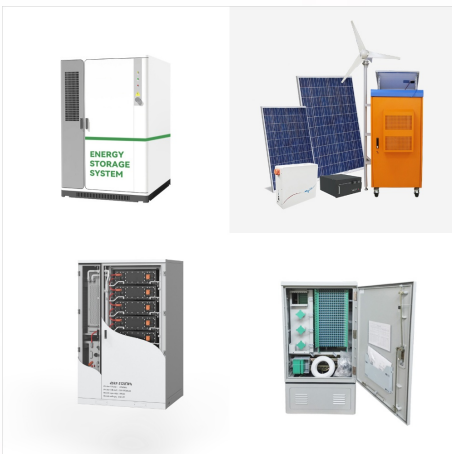




There are five energy-use sectors, and the amounts???in quadrillion Btu (or quads)???of their primary energy consumption in 2023 were: 1; electric power 32.11 quads; transportation 27.94 quads; industrial 22.56 quads; residential 6.33 quads; commercial 4.65 quads; In 2023, the electric power sector accounted for about 96% of total U.S. utility-scale ???



This report presents a roadmap for the buildout and deployment of renewable hydrogen production plants in California. The report provides a fact base to support policy decisions and inform stakeholders. The supporting analysis assesses the demand, in the transportation and other sectors, for and cost of renewable hydrogen to serve California. The ???

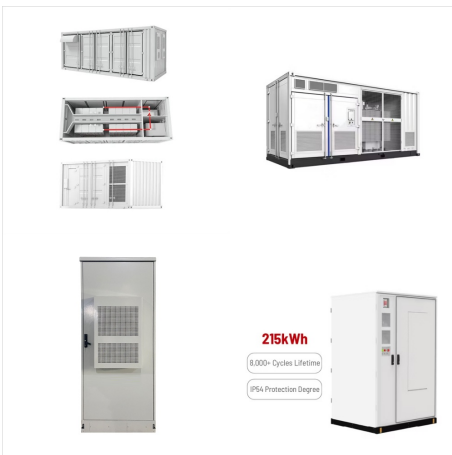


To reach the ambitious goals laid out in Senate Bill 100, California must triple its renewable energy production over the next decade. A broad approach to research across a wide array of renewable energy resource areas will enable California to avoid technology lock-in and drive a diverse approach to meeting its renewable energy goals.

# CA RENEWABLE ENERGY PRODUCTION



California's clean energy agenda is ambitious, and we are exceeding many of our preliminary targets years ahead of schedule. But to reach our ultimate goal of 100% clean electricity by 2045, we need to build more clean energy, 33% renewable energy . Reduce greenhouse gas emissions to 1990 levels . 1.5 million zero-emission vehicles sold



The California Energy Commission assesses and analyzes California's energy industry, supply, production, transportation, delivery and distribution, energy shortage contingencies, demand, and prices. The Energy Commission also forecasts electricity ???

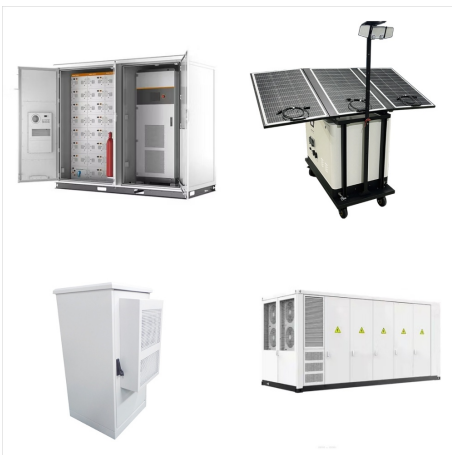


SACRAMENTO ??? California's battery storage capacity has expanded rapidly, increasing by 3,012 megawatts (MW) in just six months to reach a total of 13,391 MW. This growth marks a 30% increase since April 2024, underscoring the state's swift progress in building out clean energy infrastructure, especially during a summer marked by record-breaking heat.

# CA RENEWABLE ENERGY PRODUCTION



Our state established a landmark policy (SB 100, 2018) requiring 100% of our electricity to come from renewable energy and zero-carbon resources by 2045. This plan marks our progress ???



The project involved the expansion of an under-construction biorefinery in Paramount, California from a domestic manufacturing capacity of 30 million gallons of renewable diesel fuel by an additional 33 percent. In addition, to expanded capacity, the project expanded functionality to co-produce a renewable jet fuel that is market ready and of the quality that ???



California is one of the top renewable energy-producing states in the country. The author created this plot using data from CAISO Production and Curtailment Data. A similar curtailment event happened again on two Sundays in Spring 2022: March 13 and May 29. There was more generation than needed on lightly loaded Sundays, leading to more

# CA RENEWABLE ENERGY PRODUCTION



Renewable Supply and Demand. Renewable energy is the fastest-growing energy source globally and in the United States. Globally: About 11.2 percent of the energy consumed globally for heating, power, and transportation came from modern renewables in 2019 (i.e., biomass, geothermal, solar, hydro, wind, and biofuels), up from 8.7 percent a decade prior (see figure ???)



Renewable energy sources are making up a growing portion of California's power supply. For the first time, wind, water and solar power combined are consistently meeting or surpassing 100% of the



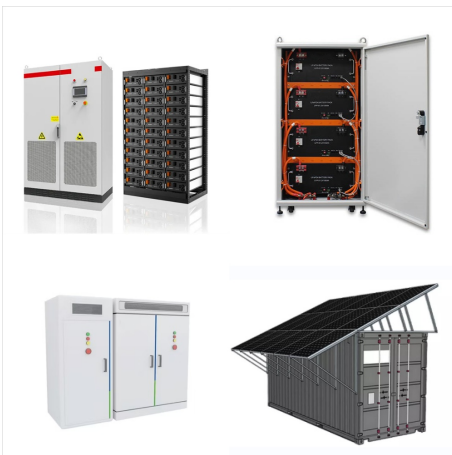
California's economy depends upon affordable, reliable, and environmentally sound supplies of power generated from renewable energy, hydroelectric power, and natural gas. An increasing percentage of energy consumed by Californians comes from renewable sources such as solar, wind, geothermal energy, biomass, and small hydro.



# CA RENEWABLE ENERGY PRODUCTION



Thanks to state budget investments and funding from the Biden-Harris administration, California has \$41 billion at work to help build a 100 percent clean electric grid, strengthen the state's water resiliency and boost water ???



The Clean Hydrogen Program was established by Assembly Bill 209 (The Energy and Climate Change budget bill, Chapter 251, Section 12, Chapter 7.6, Article 4, enacted in September 2022) to demonstrate or scale-up hydrogen projects that produce, process, deliver, store, or use hydrogen derived from water using eligible renewable energy resources, or ???



In 2020, renewable energy sources (including wind, hydroelectric, solar, biomass, and geothermal energy) generated a record 834 billion kilowatthours (kWh) of electricity, or about 21% of all the electricity generated in the United States. Only natural gas (1,617 billion kWh) produced more electricity than renewables in the United States in 2020. . Renewables ???



According to the California Solar and Storage Association, residential solar installations have dropped by 66% in the first quarter of 2024 compared with the same period in 2022.



Crimson Renewable Energy LP. proposed to increase the production capacity of its existing biodiesel production facility, located in Bakersfield (Kern County), via a series of process upgrades that were designed to reduce existing bottlenecks and speed throughput. Crimson Renewable Energy LP. estimates a total production volume of 21 million

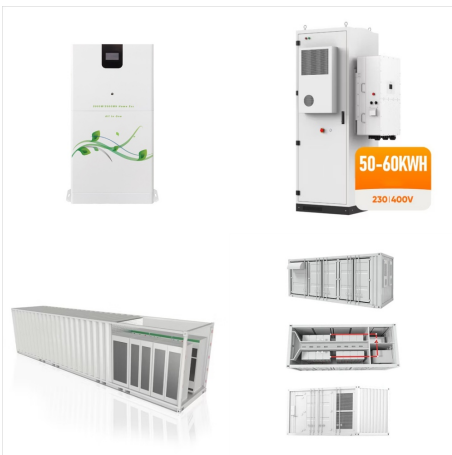


? The California Independent System Operator (ISO) on Saturday set a new record of just below 100% for renewable power generation on the grid. In a tweet on Monday, it said that 99.87% of momentary demand was served by renewable energy at 1450 local time. This beats previous records of 97.6% in early April and of 96.4% in late March.

# CA RENEWABLE ENERGY PRODUCTION



From January to mid-July of this year, zero-carbon, renewable energy exceeded demand in California for 945 hours during 146 days ??? equivalent to a month-and-a-half of 100% fossil-fuel-free



The latest data from the California Energy Commission shows that in 2021, 59% of the state's energy came from renewable and zero-carbon resources. But to fully meet our goals, it will take investment from both the public and private sectors, and modernizing our rules to ensure we can build the clean energy projects we need to power our state.



The plant named SoHyCal is run by H2B2 Electrolysis Technologies, which focuses on green hydrogen energy solutions, is located in Fresno, California. The 100 percent renewable hydrogen production

# CA RENEWABLE ENERGY PRODUCTION



To reach the ambitious goals laid out in Senate Bill 100, California must triple its renewable energy production over the next decade. A broad approach to research across a wide array of renewable energy resource areas will enable California to avoid technology lock-in and drive a diverse approach to meeting its renewable energy goals.



From about 1990 to 1993, California's biomass power generation was at its highest (more than 800 MW of installed capacity). In 1996, the energy production from biomass dwindled to about 590 MW. The expiration of price support to the biomass industry from the government is the main reason for the reduction in biomass power generation in California.



SACRAMENTO ??? The U.S. Department of Energy (DOE) and ARCHES announced the official signing of a landmark \$12.6 billion agreement to build a clean, renewable Hydrogen Hub in California, including the up to \$1.2 billion in federal funding that was announced last year when California was selected as a national hub. ARCHES is the first of seven Hydrogen Hubs ???



# CA RENEWABLE ENERGY PRODUCTION



The data is collected under the authority of the California Code of Regulations, Title 20, Division 2, Chapter 3, Section 1304(a)(1)-(2). Data reflects the CEC-1304 QFER Database as of May 8, 2024.  
Download data for Electric Generation Capacity  
Energy - Excel