

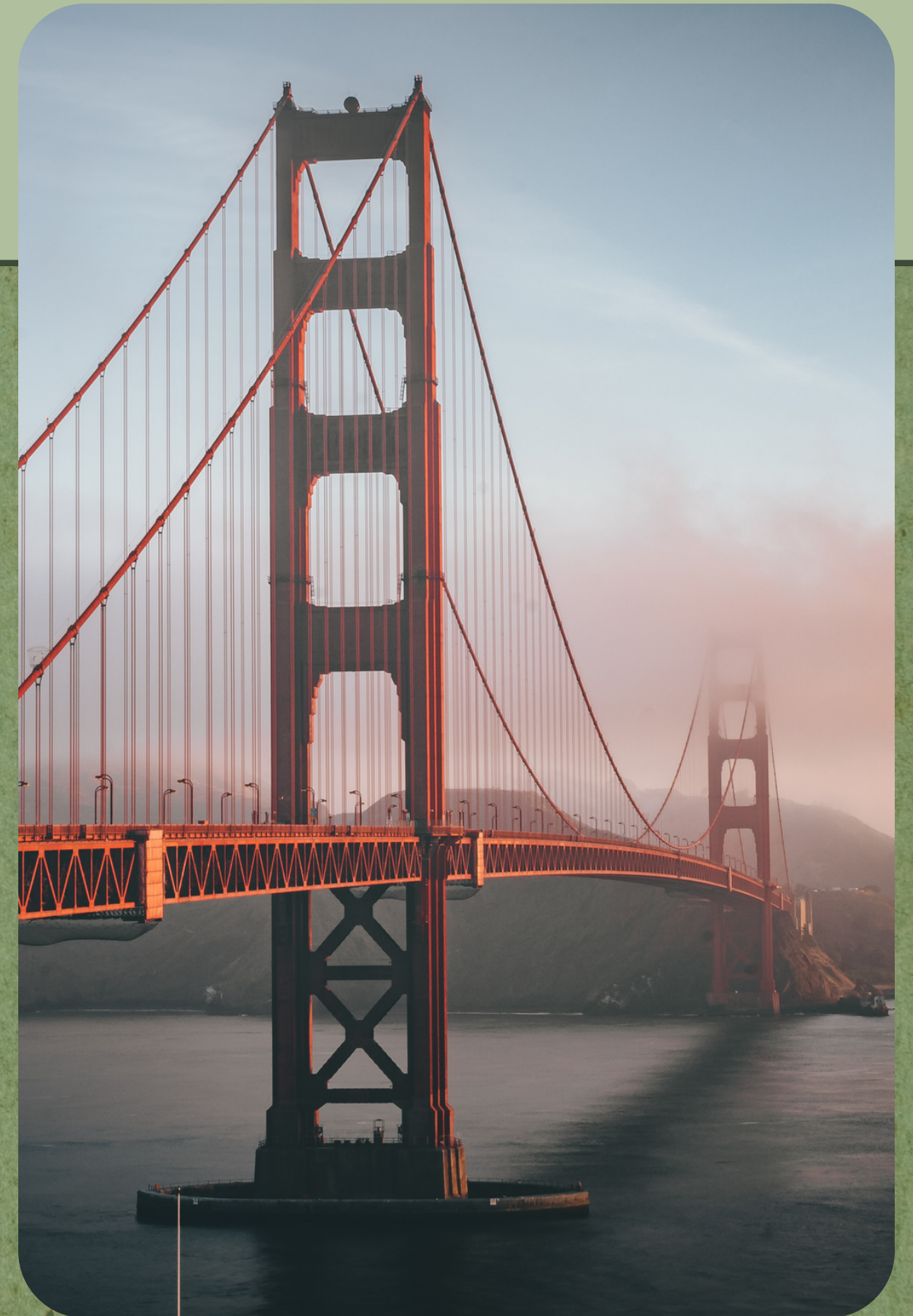


California Clean Energy Policy

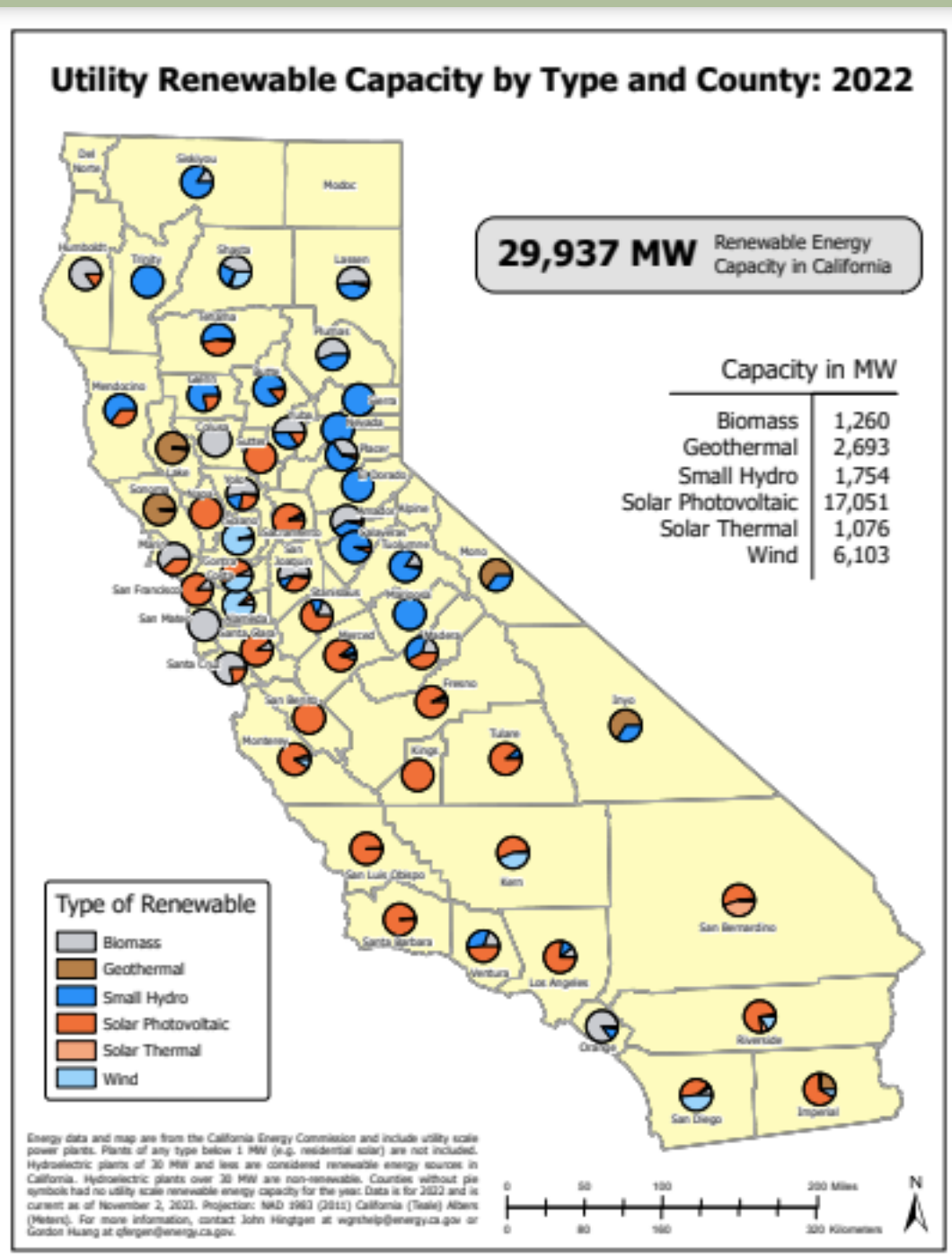
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California: A Climate Leader

- **CA is the most populous state** in the US (39 million residents)
- **Largest economy** in the US, 5th largest globally
- **Progressive politics and strong public opinion on climate change** facilitate ambitious climate policy
 - Public opinion (Yale Climate Opinion Surveys, 2021):
 - 73% report being worried about global warming (+8 from national average)
 - 79% support funding research into renewable energy (+2)
 - 80% support providing tax rebates for energy-efficient vehicles and solar panels (+3)
- Energy usage and procurement
 - CA uses more energy than any other state, except TX
 - CA's per capita energy use is less than almost all other states, due to energy efficiency efforts
 - CA produces more electricity using renewable energy than every other state but TX



Clean Energy Goals & Key Policies



- **Renewables Portfolio Standard (2002+):** Requires electricity providers to procure a certain percentage of energy from renewable sources.
 - **100 Perfect Clean Energy Act (SB 100, 2018):** Sets an RPS goal to generate 60% of electricity from renewable energy sources by 2030 and **100% by 2045**.
- **CA Public Utilities Commission (2022)** set a goal to add 25.5 GW of renewable energy and 15 GW of storage by 2032.
- **CA Energy Commission (AB525, 2021)** established a preliminary planning goal of developing 2-5 GW of offshore wind by 2030 and 25 GW by 2045.
- **Western Grid Regionalization (2023):** Energy regulators from CA, WA, OR, AZ, NM announced a plan to form a new entity to manage power across states, which would further development of clean electricity sources and lower costs for consumers.
- **Funding from CA Energy Commission:** CEC provides grants and incentives to support clean energy development and use.

Solar

Goals:

**100% zero-carbon electricity by 2045
(60% by 2030)**

- **CA is the nation's top producer of electricity from solar energy**
 - In 2022, CA produced 31% of the nation's total utility-scale and small-scale solar PV electricity generation and 69% of U.S. utility-scale solar thermal electricity generation
- **Solar is the largest source of CA's renewable energy generation** - 27% of the state's net electricity generation in 2022 (19% from utility-scale, 8% from small-scale solar generation)
- **Current solar capacity:** At the beginning of 2023, CA had 32,000 MW of solar capacity
 - **Storage capacity:** 5600 MW of storage capacity (July 2023, a 10x increase since 2020)
- **Types of solar:**
 - **Solar thermal facilities + solar photovoltaic (PV) plants**
 - **Utility-Scale:** All CA solar thermal facilities and several of the largest solar PV plants are in CA's southeastern deserts
 - 7 utility-scale solar projects covering 19,000 acres of public land have been approved, and would provide 3,000 MW of electricity (powering 2 million homes)
 - **Small-Scale:** Solar systems with less than 1 MW capacity (aka rooftop solar)
- **Key CA solar policy:**
 - **2012 Western Solar Plan:** Blueprint for solar energy development in AZ, CA, CO, NV, NM, UT
 - **Community Solar (AB2316, 2022):** Creates a community renewable energy program under the CA Public Utilities Commission
 - **CA Solar Initiative (2006):** Includes financial incentives to install solar panels on homes

Wind

Goals:

- (1) 100% zero-carbon electricity by 2045 (60% by 2030)
- (2) Generate up to 5 GW from offshore wind by 2030 and 25 GW by 2045

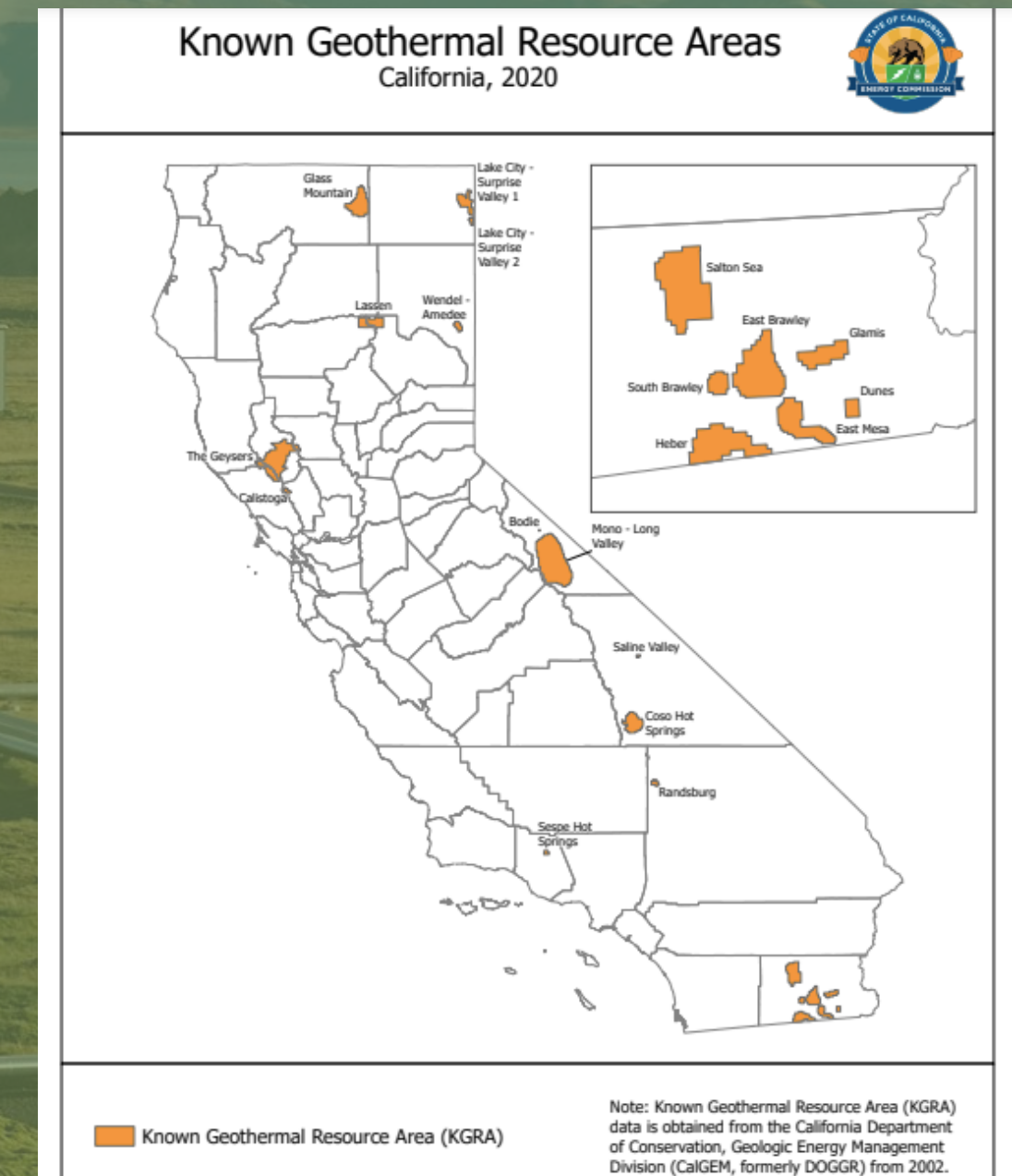
- **CA is 8th in the nation in wind energy production**, which is projected to grow
 - Onshore + offshore wind accounted for 7% of CA's in-state electricity generation in 2022
- **Current wind capacity:** At the beginning of 2023, CA produced 6,200 MW of wind energy
- **Types of wind energy:**
 - **Onshore:** 6 major wind resource areas: Altamont, East San Diego County, Pacheco, Solano, San Geronio, Tehachapi
 - **Offshore:** CA has some of the best offshore wind resources in the country and is positioned to become a leader on floating offshore wind
- **Floating offshore wind developments**
 - Floating offshore wind suits the deep waters of the Pacific Outer Continental Shelf
 - Achieving 25 GW will require building 1,600 turbines (and will create 8,000 union jobs)
 - **5 new leases:** In 2022, the Bureau of Ocean Energy Management sold 5 leases for offshore wind projects in Morro and Humboldt Bays. Next step: set up a central procurement entity to buy the clean power generated by these projects, which will enable project financing.
- **Key CA wind policy:**
 - **AB525, 2021:** Requires CA Energy Commission to develop a strategic plan for offshore wind energy developments; sets offshore wind energy generation goals (25 GW/25m homes)

Geothermal

Goals:

100% zero-carbon electricity by 2045
(60% by 2030)

- **CA is the top producer of geothermal energy in the U.S.**
 - Geothermal power plants use steam to turn large turbines which run electrical generators
 - In 2022, CA produced 69% of the nation's utility-scale geothermal-sourced electricity
 - Geothermal power accounted for 6% of CA's utility-scale generation and 5% of the state's total in-state generation in 2022
- **Geothermal resource areas**
 - **Geysers in the Mayacamas Mountains north of San Francisco are the world's largest geothermal field and the largest complex of geothermal power plants** (725 MW of installed capacity)
 - **Other geothermal resources** in north-central volcanic areas, near the Salton Sea in Southern CA, and along the CA-NV border
- **Geothermal capacity:**
 - Operating geothermal plants have a combined total capacity of 1,867 MW (enough to power ~ 1 million homes)



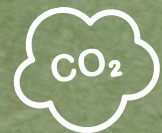
Hydroelectric

Goals:

100% zero-carbon electricity by 2045
(60% by 2030)

- **CA is consistently among the top four hydroelectric producers in the country** (hydroelectric capacity varies annual, dependent on rainfall)
 - **CA has the second-largest hydroelectric generating capacity** (after WA)
 - In 2022, hydroelectric accounted for 8% of CA in-state energy generation
- **Types of hydroelectric power:**
 - **Large hydro:** facilities larger than 30 MW
 - **Small hydro:** facilities smaller than 30 MW
- California's hydro generation plants are mostly in the eastern mountain ranges

Other California Climate Policies



REDUCING GREENHOUSE GAS EMISSIONS

CA Global Warming Solutions Act (AB32, 2006; SB32, 2016): Requires a reduction in GHG emissions to 1990 levels by 2020 and to 40% below 1990 levels by 2030, respectively.



DISINCENTIVIZING FOSSIL FUELS

- **Cap and Trade Program:** A system in which power plants, refineries, and other large facilities buy and sell GHG emissions allowances to meet overall emissions limitations set by CARB
- **GHG Reduction Fund:** State program allocating proceeds from cap-and-trade auctions to support investments and projects that reduce GHG emissions across the state
- **Climate Change Scoping Plan:** Comprehensive plan outlining how to achieve GHG emissions reductions targets



BUILDINGS SECTOR

- Commitment to 3 million climate-ready homes by 2030
- \$1.4 billion to clean, healthy, and fossil free buildings
- **Green Building Standard Program (2022):** Energy efficiency standards and retrofits for existing buildings
- **Equitable Building Decarbonization Program (2022):** Commits \$922 million over 4 years to installing all-electric appliances in low-income homes



TRANSPORTATION SECTOR

- **Automobile Emissions Standards (2022):** Sets first GHG emission standards for passenger vehicles
- **Electric Vehicle Charging (2015):** Requires local governments to plan EV charging infrastructure
- **Low Carbon Fuel Standard (2011):** Reduces the GHG emissions intensity in transportation fuel products
- **Advanced Clean Cars Program (2012, 2022):** Introduces vehicle performance standards and manufacturer requirements to reduce GHG and smog-causing pollutant emissions from cars

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