

# California ISO's ELECTRICITY ROAD MAP

an overview of the major elements of the state's electric grid

# DRAFT

## STRATEGY 1 Facilitate California's transition to a smarter, cleaner, more reliable and secure energy future

Renewable energy can reduce greenhouse gas emissions and create new jobs. However, solar and wind resources can be less predictable than conventional fossil-fuel and nuclear power plants. They are more dependent on weather and tend to be located far from the population and industrial centers they serve. The ISO has initiatives underway to **expand grid infrastructure** to bring renewable energy online, **assess the operational impacts** of a more renewable resource-based fleet, and better **align market rules and grid operations** with these new technologies.

## STRATEGY 4 Explore opportunities for regional collaboration and focused technological innovation

The Western electric grid is itself an interconnected network involving dozens of different regulatory, grid management, utility and other organizations. The Western region offers many possibilities for improving the reliability, sustainability, efficiency and security of the electric system we share – including access to vast resources of hydroelectric, geothermal, wind and solar generation. Working together with our neighbors in the West, the ISO will explore regional opportunities to serve our customers better together, rather than separately. In addition, we will **leverage California's track record of technological innovation** in searching for ingenious solutions to better manage the increasingly complex and diverse electric network we all rely.

## STRATEGY 2 Ensure continued reliability during grid transformation

California's electricity system relies heavily on fossil-fuel power plants reaching the end of their economic and physical lives, in addition to facing tough environmental requirements. Some are located in areas without sufficient transmission access to other power sources; and many also provide essential backup capacity for the less predictable output of renewable resources. To ensure Californians have the electricity they need when and where they need it, the ISO works closely with state agencies to **facilitate the retirement or repowering of older plants without compromising grid reliability** during our transition to a greener power network.

## STRATEGY 3 Strengthen California's global leadership commitment to renewable, responsible and reliable energy

Energy policy involves difficult tradeoffs among competing public and private interests – from customer concerns about cost, energy providers' need for profits, expectations for accountability and a broad commitment to environmental quality and economic competitiveness. Several state and federal entities are involved, with separate and sometimes overlapping responsibilities. To build the electric network required to fuel our state's economic prosperity, the ISO collaborates with stakeholders and other agencies to **streamline the end-to-end approval process for new generation and transmission infrastructure** without compromising required environmental reviews and project assessments.

### WHO WE ARE

The **California Independent System Operator (ISO)** is the nonprofit public benefit corporation that manages the flow of electricity across transmission lines that serve 30 million Californians. We balance electricity load and generation resources across one of the largest grids in the world, covering three quarters of the state. It delivers over 200-billion kilowatt hours of electricity each year. One of ten ISOs in North America, we handle approximately 35% of the electric load in the West.

### WHAT WE DO

We are responsible for ensuring the reliability of electric service, increasing the renewability of the state's generation resource portfolio, keeping prices competitive and strengthening the resiliency of the California power grid.

1. We operate the electric grid to maintain electric reliability. This is a 24-hour-a-day job requiring ISO operators to constantly assess transmission system status. Every four seconds, the ISO balances resources to meet demand; every five minutes, we account for operating reserves and dispatch the most efficient resource to meet demand, while ensuring enough transmission capacity is available to deliver that power.

As we integrate new renewable generation facilities into our grid, our expanded portfolio of resources will include traditional generators and advanced technologies needed to quickly respond to fluctuations in wind and solar production.

2. We plan transmission infrastructure to accommodate new power plants and grid expansions necessary to maintain electric reliability and cost efficiency.
3. We manage a wholesale power market and provide equal access to 25,865 circuit-miles of transmission lines to diverse generators competing to bring power to customers at the lowest cost.

### WHO WE WORK WITH

The ISO works with several hundred entities, including traditional utilities, private power plant owners, other regional grid operators (or balancing authorities), generation and transmission developers, demand response and storage entities, and state and federal agencies. We are regulated by the Federal Energy Regulatory Commission, and we operate under standards set by the North American Electric Reliability Corporation and the Western Electricity Coordinating Council. In addition to environmental regulators, we work closely with the California Public Utilities Commission, which regulates investor-owned utility rates and practices, and the California Energy Commission, which helps shape overall state energy policy.

### California ISO Grid Snapshot

30 million Californians served

25,865 circuit-miles of transmission lines

58,246 MW of power plant capacity

Transmission lines  
 — ±500 kV DC  
 — 500 kV  
 — 360 kV and under

California ISO  
 Other grid operators  
 Highest demand areas

Power plants  
 Type  
 ● Coal  
 ● Geothermal  
 ● Hydro  
 ● Nuclear  
 ● Oil/Gas  
 ● Solar  
 ● Waste  
 ● Wind

Scale in megawatts  
 ● 1,000+  
 ● 100-999  
 ● 0-99

More information:  
 Federal Energy Regulatory Commission  
[www.ferc.gov](http://www.ferc.gov)  
 North American Electric Reliability Corporation  
[www.nerc.com](http://www.nerc.com)  
 Western Electricity Coordinating Council  
[www.wecc.biz](http://www.wecc.biz)  
 ISO/RTO Council  
[www.isortc.org](http://www.isortc.org)  
 State of California, Office of Governor  
[www.gov.ca.gov](http://www.gov.ca.gov)

California Energy Commission  
[www.energy.ca.gov](http://www.energy.ca.gov)  
 California Public Utilities Commission  
[www.cpuc.ca.gov/puc](http://www.cpuc.ca.gov/puc)  
 California Air Resources Board  
[www.arb.ca.gov](http://www.arb.ca.gov)  
 California State Water Resources Control Board  
[www.swrcb.ca.gov](http://www.swrcb.ca.gov)  
 California's Clean Energy Future  
[www.caleanenergyfuture.org](http://www.caleanenergyfuture.org)

California ISO  
 Shaping a Renewed Future  
 916.351.4400 • [www.caiso.com](http://www.caiso.com)

Map is for illustrative purposes only.

