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STATE OF CALIFORNIA
ENERGY COMMISSION

2023

Integrated Energy Policy Report Highlights

2023 Integrated Energy Policy Report Highlights

The California Energy Commission (CEC) is required to prepare a biennial report assessing energy issues facing the state. The report is crafted in collaboration with a range of stakeholders and results are delivered as the Integrated Energy Policy Report (IEPR).

Energy planning and forecasting presented in the IEPR informs the Integrated Resource Plan (IRP) process directing how much energy load serving entities, like the state's investor-owned utilities, must procure to cover forecasted energy demand.

2023 Integrated Energy Policy Report Topics

- Accelerated Connection of Clean Energy
- California Energy Demand Forecast
- Potential Growth of Hydrogen in California
- Updates on key issues including:
  - Gas System Decarbonization
  - Benefits of the Clean Transportation Program
  - Energy Efficiency

Many of the issues in the IEPR require action if the state is to meet its climate, energy, and air quality goals while maintaining reliability and controlling costs.

Accelerating Connection of Clean Energy Resources

Achieving California's goals for mitigating climate change and protecting the health of all Californians hinges on simultaneously transitioning to renewable generation while electrifying much of our economy. A safe, reliable, and affordable electric grid is the keystone of the clean energy transition.

California needs to accelerate the pace of clean energy resource deployment, including flexible loads like EV chargers and heat pumps connected at the distribution level as well as grid-scale renewables and storage connected at the transmission level. While collectively we have made a lot of progress, there remain significant gaps between deployments today and projected future needs. California is projected to need more than 10 times the number of public and shared private EV chargers and 4 times the number of heat pumps by 2030. And although more than 50 GW of renewable generation and storage is operating in state today, by 2045 projections indicate a need for more than 200 GW.

This chapter was developed in close collaboration between California's energy entities. The chapter is organized around barriers to closing clean energy resource deployment gaps and catalogs the many ongoing activities to help address them. Building from these ongoing efforts, the chapter provides recommendations to accelerate deployment, such as:

RECOMMENDATIONS

- Expand proactive investment in electric grid infrastructure
- Facilitate flexible service connections and deployment of temporary power solutions to connect projects while permanent infrastructure is constructed
- Explore alternative sources of funding for upgrades and maximizing load flexibility to limit ratepayer burdens
- Increase transparency into grid capacity and connection processes through publicly available tools and datasets
- Support faster permitting decisions including through expanding the capabilities of automated permitting tools for local authorities

California Energy Demand Forecast

The 2023 energy demand forecast reflects increasing electricity demand, particularly in the transportation sector and buildings, as well as increased onsite solar generation and battery storage.

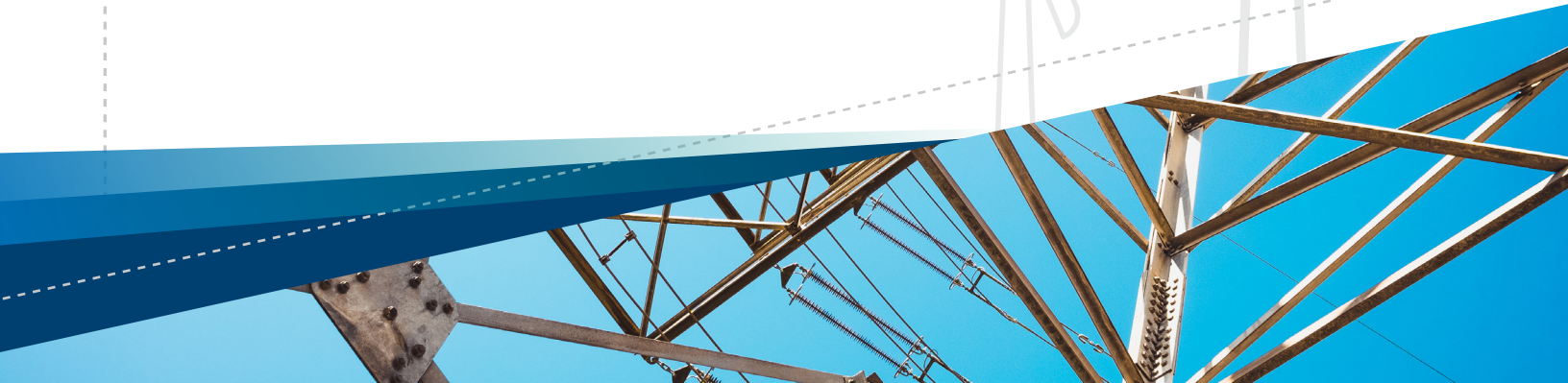
Accounting for rooftop solar and the projected impacts of energy efficiency, building electrification, and transportation electrification, statewide electricity sales grow to almost 350,700 GWh in 2040. This is lower than projections in the 2022 IEPR Update forecast through 2034 largely due to slower growth in projected households and population, increases in rooftop solar generation, and increases in electricity rates.

The managed system peak for the planning forecast reaches 63,204 MW by 2040. Relative to the 2022 IEPR Update, the electricity demand in the 2023 IEPR planning forecast is lower in the near-term due primarily to a lower baseline consumption forecast and increased peak reduction impacts expected from behind-the-meter solar.

California Independent System Operator Peak Demand

2023	44,534 MW
2035	56,937 MW*
2040	63,204 MW*

*Projected



Potential Growth of Hydrogen in California

Senate Bill 1075 (Skinner, 2022) directed the CEC to study and model potential growth of hydrogen in decarbonizing the electric power and transportation sectors in California as part of the 2023 and 2025 IEPRs. The report explores the financial and resource requirements associated with scenarios of hydrogen adoption.

The analysis considers only hydrogen produced through electrolysis (electrolytic hydrogen), using renewable electricity and water to produce hydrogen. The intent is to estimate a high bookend of what large-scale electrolytic hydrogen production could require in terms of renewable electricity consumption and renewable generation capacity for early insights into potential resource planning needs. The preliminary analysis illustrates the significant renewable electricity requirements associated with large-scale deployment of electrolytic hydrogen production in the state.

Electricity Generation: Preliminary findings indicate roughly 35 gigawatts of renewable generation would be required to produce sufficient electrolytic hydrogen to replace all the fossil gas that the 2022 CARB Scoping Plan Update estimates would be combusted for electricity generation in 2045.

Transportation: Preliminary findings indicate roughly 18 gigawatts of renewable generation would be required to produce all of the hydrogen used for transportation in 2040 identified in the 2022 CARB Scoping Plan Update by electrolysis.

These illustrative scenarios are not meant to reflect forecasts of actual adoption.

RECOMMENDATIONS

- Future analyses in the 2025 IEPR will expand production pathways to include biomass feedstocks, as well as the requirements and costs of clean renewable hydrogen delivery and storage infrastructure, which were not included in this preliminary analysis.
- The CEC will develop new scenarios for the 2025 IEPR based on market trends and the findings from the upcoming Senate Bill 100 joint agency assessment of resources needed to deliver 100 percent renewable and zero carbon electricity by 2045.

Updates on Key Issues

Gas System Decarbonization

The CEC's 30-year projections of delivered gas prices to customers for PG&E, SoCalGas, and SDG&E show prices increasing out to 2050 for the residential and commercial sectors, while remaining relatively stable for the industrial and electric generation sectors.

The CEC, along with other energy agencies, gas utilities, electric utilities, local governments, and the private sector are advancing decarbonization efforts such as development of low-carbon fuels (including clean and renewable hydrogen), electrification, and renewable energy.

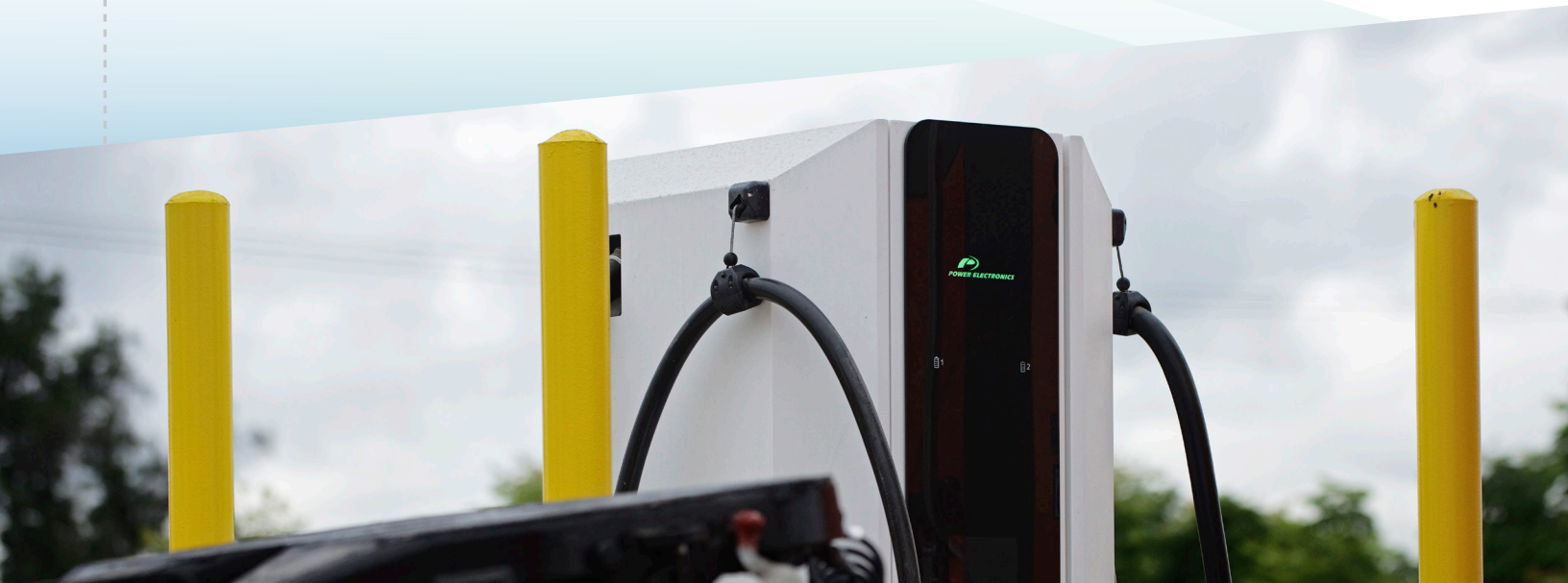
The CEC, CPUC, and CARB are making progress on decarbonizing the gas system through proceedings, rulemakings, and other initiatives. The agencies must continue to implement a long-term, coordinated planning effort to help address challenges to energy affordability, reliability, health, and safety. This effort must also give attention to ensuring a just transition for the industry's skilled workforce.

Updates on Key Issues

Benefits of the Clean Transportation Program

The Clean Transportation Program has provided more than $1.8 billion in funding through the program since 2009. As of July 2023, the Clean Transportation Program has funded nearly 24,000 electric vehicle chargers to support the deployment of EVs in California.

The CEC partnered with NREL to quantify the direct impacts of program investments, both in terms of direct emission reduction as well as long-term transformation to a zero-emission transportation sector. By 2030, the projects funded under the program will directly reduce greenhouse gas emissions by 925 thousand tons CO_2e per year. Also, by 2030, the projects will indirectly induce further greenhouse gas emission reductions, ranging from 165.3 to 522.2 thousand metric tons per year.



Updates on Key Issues

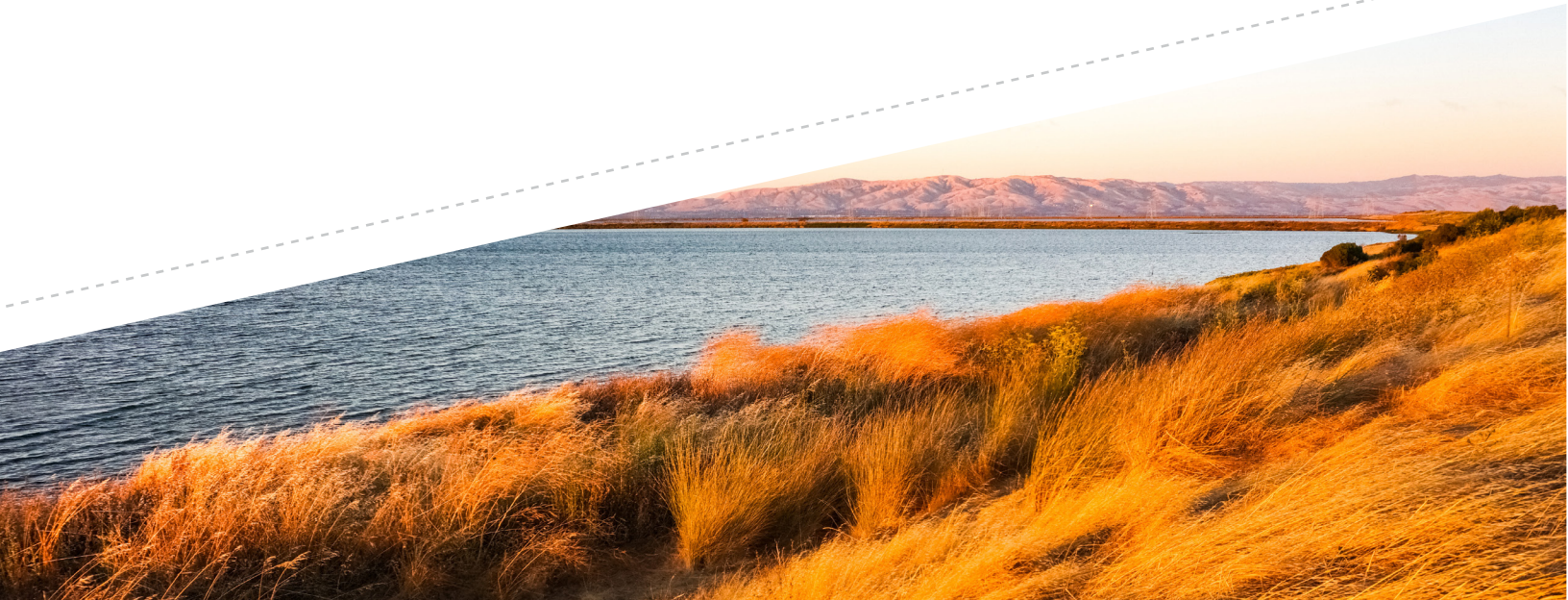
Energy Efficiency

As California focuses on electrifying energy use to meet climate goals, equitably advancing energy efficiency is a foundational part of the transition to a clean energy future.

- On January 1, 2023, 2022 California Building Energy Code went into effect. It applies to both new construction and significant alterations of existing buildings. Over the next 30 years, the CEC estimates that this code update will provide $1.5 billion in consumer benefits.

- In October 2023, the CEC approved the direct install of low- or no-cost retrofits for all-electric measures, as well as energy efficiency and remediation, for low-income, single-family households and multifamily building owners and tenants in disadvantaged communities.

- The same month, the CEC adopted its first flexible demand appliance standards in 2023 requiring controls for residential swimming pool equipment. These standards enable customers to benefit from dynamic electricity rates and have the potential to provide over 500 MW of permanent load flex capacity to support grid reliability. In addition to helping stabilize the electric grid, consumers will save money on their electricity bills. Consumers on a time-of-use rate plan can save an estimated $1,131 over the life of the pool control.



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