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California records one of its single largest drops in climate pollution on record

Renewables peak as fossil fuel power generation reaches historic low, while transportation emissions also plummet

While not on target to reach 2030 climate goals, state continues to close the gap

San Francisco, Calif. — In one of California's single largest year-over-year emissions reductions on record, the state lowered its climate pollution by 3% in 2023. The drop in 2023, the most recent year for which data is available, was surpassed only by reductions achieved in 2009 during the Great Recession and 2020 during the COVID-19 pandemic. While the state is still not on track to meet its 2030 targets, the 17th annual *California Green Innovation Index*, released today by think tank Next 10, finds that the increased rate of emissions reduction puts those targets closer in sight.

"California is making significant progress reducing greenhouse gas emissions, with huge reductions coming from the electricity sector," said **F. Noel Perry**, **Founder of Next 10.** "While the data show California must increase its ambition in order to meet our 2030 climate goals, it's very encouraging that we are closing the gap. This year, our state became the fourth-largest economy in the world. Our GDP grew as emissions declined, and that's a continued lesson for the rest of the world: climate action goes hand-in-hand with economic benefits."

From 2022 to 2023, GHG emissions per capita in California fell by 2.8% while inflation-adjusted GDP per capita grew by 2.3% over the same time period, demonstrating that **climate ambition and economic growth can complement each other**. The report details how heavy-duty vehicle emissions have fallen dramatically in California, even as the economy continues to grow.

To meet California's goal of reducing greenhouse gas emissions by 40% below 1990 levels by 2030, the state must reduce emissions by an average of 4.4% each year. At the most recent five-year average annual reduction pace of 2.8%, California will meet its 2030 goal in 2035 – an improvement from last year when experts projected the date would be 2037.

"With a federal administration that is hostile to clean energy and climate, it is up to the states to step up and show leadership in energy and climate policies," said **Hoyu Chong, lead researcher and**

principal of CEC Economics. “Now is the opportunity for California to show other states that emissions targets and policy commitments to clean energy deliver real results.”

Renewables surge as fossil fuel power declines

California’s investments in solar, wind and battery storage paid off as renewable power generation rose to meet energy demand while fossil fuels declined. **In 2024, generation from renewable energy sources and large hydroelectric power topped 50% of California’s power mix (52.3%) for the first time**. During the same period, **fossil fuels fell to a record low share of the power mix at 36.3% in 2024,** a 4.8% reduction in just three years.

Power generation from non-hydropower renewable sources increased by 4.4% from 2023 to 2024—the largest increase on record—to 41.3% of the power mix. If the state can maintain this level of annual increase for each of the next two years, California will meet its goal of 50% of generation from non-hydro renewables by 2026 despite missing the 2024 target of 44%.

“California has continued to deploy renewable energy and phased down its gas generation, delivering real emissions reductions,” said **Stephanie Leonard, Research Director at Next 10**. “With increased commitment from our policymakers, I am optimistic that we can meet the bold climate targets we set for ourselves in 2016.”

Transportation emissions continue to fall

While transportation remains the largest-emitting sector at 38% of total emissions in 2023, it also **saw the largest reduction in emissions from 2022 to 2023 at 4.6%, driven by a 17% decline in emissions from heavy-duty vehicles.** While overall emissions from light-duty vehicles fell slightly by 0.6%, due to greater EV adoption and improved fuel efficiency, emissions per vehicle miles traveled (VMT) in the state fell to the lowest level ever at 0.39 tons of CO_2-equivalent per 1,000 vehicle miles in 2023.

“California’s transportation emissions are finally moving in the right direction, which is huge news since this is the sector where we need the deepest cuts,” said **Perry**. “I’m concerned that the elimination of the EV tax credit and efforts to revoke California’s stricter tailpipe emissions standards will slow our progress just as this momentum is building. Still, we're seeing large emissions reductions from heavy-duty vehicles thanks to existing regulations, proving that smart policy can drive transformation even in tough areas.”

Other Key Findings:

Takeaway: Climate policies and greenhouse gas reduction targets have increased California’s progress in slashing its emissions, though a faster pace is required to meet the state’s 2030 goals on time.

- Between 2016 when California passed SB 32, the law instituting greenhouse gas reduction targets, and 2023, the state nearly doubled its emission reductions from the previous decade.

- Every sector has cut their emissions since 2006 except for the commercial and residential sectors, where emissions were 43.9% and 13.0% higher in 2023, respectively.
    - This is primarily due to the use of higher-emitting substitutes for ozone-depleting substances' (SODs) which are used for refrigeration and air conditioning.
- Even if California manages to meet the SB 32 target by 2030, the state would need to increase its emissions reduction rate to 8.8% per year to reach the goal of 85% below 1990 levels by 2045—double the pace required to meet the 2030 target.

Transportation

Takeaway: California made substantial progress electrifying light-duty vehicles in 2024, but maintaining that momentum could prove challenging after the repeal of EV tax credits.

- The transportation sector saw the largest drop in emissions at 4.6%. Emissions from heavy-duty vehicles dropped 17%, largely due to the increasing use of cleaner fuels like biodiesel through the Low Carbon Fuel Standard (LCFS).
- The number of zero-emission vehicles (ZEVs) on-road in California totaled just under 1.9 million in 2024, a 25.3% increase from 2023.
    - Together, ZEV registrations totaled a quarter (25.5%) of new vehicle registrations in 2024 in California.
- To reach the 2030 goal of 5 million ZEVs on-road, ZEV registrations need to increase by an annual average of 17.5% from 2025 to 2030.
    - The repeal of the EV tax credits may make it harder to reach the 2030 goal despite meeting the 2025 goal two years early and historically strong adoption rates.

Renewable Energy

Takeaway: Emissions from California's power sector fell significantly while the state's strategic deployment of utility-scale batteries to store solar and wind power for peak deployment continues to skyrocket.

- Emissions from the electric power sector fell by 4% from 2022 to 2023—driven by a decrease of 2.1% from in-state generation and by 9.3% from imports.
    - From 2006 to 2023, emissions from the electric power sector overall have fallen by 45%, with a 17.4% drop resulting from in-state generation and a nearly 80% reduction from imports.
- In 2024, power generation from solar (in-state generation and imports) increased by 23.8% compared to 2023, after falling between 2022 and 2023.
- Within the first three months of 2025, California broke its previous 2024 record for battery energy storage deployed on the grid, adding 7,272 MW—enough to provide power for between 5.5 and 7.2 million homes.
    - In the next two years, California plans to install 8,551 MW of battery storage capacity — more than the total capacity installed in the two decades before (7,913 MW).

- To meet California's goal of 52% electricity generation from Renewable Portfolio Standard (RPS)-eligible by 2027, the state needs to increase its generation by nearly 11%. To meet the goal of 60% RPS eligible sources by 2030, it must increase by nearly 19%.

Energy Efficiency

Takeaway: While California's electricity rates continue to eclipse the national average, the state's total energy consumption is decreasing, suggesting more adoption of energy efficiency measures.

- California has some of the highest electricity costs per kWh—second-highest (jointly with Connecticut and Maryland) for residential customers ($0.30/kWh), second-highest for commercial customers ($0.24/kWh), and the fourth-highest for industrial customers ($0.19/kWh).
    - In 2023, the average monthly electricity bill for industrial customers was 28.1% *lower* in California than the U.S. average, 67.0% higher in California for commercial customers, and 5.8% higher in California for residential customers.
- Residential electricity rates grew more than three times faster in California (almost 10%) than the national average (almost 3%) from 2022 to 2023.
    - At the same time, energy efficient appliances and greater awareness of energy use have led to an overall decrease in use. The state's energy use in 2023 declined 14% below 2007 levels, when California energy use peaked.
- California's total statewide energy consumption was 4.3% lower in 2023 than in 1990, despite the state being 31% more populous.

Find the report here: https://greeninnovationindex.org/2025-edition/

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About Next 10

Next 10 is an independent, nonpartisan, nonprofit organization that educates, engages and empowers Californians to improve the state's future. With a focus on the intersection of the economy, the environment, and quality of life, Next 10 employs research from leading experts on complex state issues and creates a portfolio of nonpartisan educational materials to foster a deeper understanding of the critical issues affecting our state.