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## **California's greenhouse gas emissions plunged amidst pandemic restrictions, but climate gains may not hold**

*14th annual California Green Innovation Index finds transportation pollution fell  
for the third straight year, even as in-state power sector emissions spiked*

**SAN FRANCISCO** — California's greenhouse gas emission fell a remarkable 8.7% in 2020 amidst pandemic-induced economic disruptions and travel restrictions. But while the significant drop in emissions has helped the state make progress toward its 2030 climate targets, it masks a rise in pollution from in-state power generation, as stubbornly-slow renewable energy growth threatens California's transition to carbon neutrality. At the same time, a drop in emissions from the transportation sector for the third-consecutive year could signal a breakthrough in the state's largest source of climate pollution, if pandemic-era shifts towards hybrid work remain and electric vehicle adoption continues to rise.

That's the finding of the fourteenth annual *California Green Innovation Index*—released today by the nonpartisan nonprofit Next 10 and prepared by Beacon Economics. The report's analysis of the latest available emissions data found that while transportation-sector, commercial-sector, and industrial-sector emissions dropped in 2020, emissions from in-state electricity and agriculture increased.

“Despite the significant 2020 emissions drop, a closer look at the data from this year's *Index* suggests California still faces challenges,” said F. Noel Perry, businessman and founder of Next 10. “The increase in in-state power generation pollution is worrisome. Not only is this pollution hurting the health of those living close to these facilities, this is the sector that overarching decarbonization depends on. We'll need to see a significant increase in clean energy generation—at least 8% per year—in the coming years, to power homes, vehicles and industry.”

The report also analyzed the economic and jobs returns on investment from four of California's signature climate and clean energy programs, and found that a cumulative \$2.76 billion



investment in these programs generated \$5.35 billion in economic output and created 8,521 jobs—while reducing greenhouse gas emissions. The findings should inform California’s budget priorities, as the state pursues strategies to fend off a potential looming recession.

“California’s return on climate investments has been striking,” said Patrick Adler, research manager at Beacon Economics. “The state has shown that it can create jobs and strong economic growth—while also helping to cut the pollution that is driving climate change and adversely impacting communities across California.”

### **TRANSPORTATION EMISSIONS DROPPED FOR THIRD CONSECUTIVE YEAR, SIGNALING POTENTIAL BREAKTHROUGH, ALBEIT TEMPORARY; PUBLIC TRANSIT USE CONTINUES TO DECLINE**

The *Index* found that transportation sector emissions—California’s largest source of greenhouse gas emissions—plunged by a staggering 16.1% in 2020, amidst pandemic-induced travel restrictions and a shift to working from home. The remarkable decrease was driven by a 19.8% reduction in emissions from light-duty passenger cars, a 18.5% decrease from SUVs and light-duty trucks, a 12.2% emissions decrease from off-road vehicles, and a 7.4% emissions decrease from heavy-duty trucks

“Due to the pandemic, the emissions drop from California’s transportation sector in 2020 was remarkable. This is the third straight year that we’ve seen a decline in pollution from the state’s largest and most stubborn source of emissions. The encouraging trends in this year’s *Index* on EV adoption and charging build-out show that EVs are reaching new, lower-income consumers and folks in rural areas,” noted Perry. “But to make continual progress in the transportation sector, we need structural changes to how we move around our cities and towns, and we urgently need to address the looming public transit crisis.”

While electric vehicle sales of all classes fell 16.5% from 2019 to 2020 due to pandemic-related uncertainty and supply chain challenges, sales data from 2021 paint a more encouraging picture. Electric vehicle sales shot up 79% in 2021 compared to 2020, and battery electric vehicles reached 9.5% of new vehicle registration in 2021, up from the previous peak of 6.2% in 2020.

The increase in electric vehicle ownership in rural areas showed the most encouraging signs of growth, increasing by an impressive 57.1% in 2021 compared to 2019. Roughly half of the growth in electric vehicles across the state of California in 2021 took place in rural areas compared to 2019. Promising electric vehicle growth is likely to continue in coming years, as



California tracks towards achieving a landmark regulation adopted this year that will phase out the sale of gasoline cars by 2035.

The *Index's* encouraging data on electric vehicle sales contrasts sharply with its findings on public transit ridership, which plunged a stunning 52% in 2020. More concerning, ridership fell an additional 3% in 2021—even after pandemic restrictions began to lift and some people started returning to the office. The findings suggest that the pandemic could push California deeper into its historical trend of individual car ownership, despite the climate impacts. After a steady decline since the peak in 2018, the vehicle ownership rate rose to 78.4 per 100 persons in 2021, up from 74.7 in 2020.

**Key findings include:**

- Transportation-sector emissions accounted for 37.9% of California's total emissions in 2020, down from 41.2% in 2019.
- Consumer preferences continued to shift towards pickup trucks, mini-vans, and SUVs in 2021, as the light truck sales (+16.6%) more than doubled the sale of cars (+7.1%).
- Natural gas-powered vehicle registrations fell 23.2% in 2021, while registrations of electric vehicles increased by 34%, compared to 2020.
- While sales of battery electric, plug-in hybrid, and hydrogen vehicles increased significantly in 2021, they still only accounted for 2.8% of all registered on-road vehicles in California in 2021, up from 2.2% in 2020.

**SLUGGISH RENEWABLE ENERGY GROWTH PAINTS WORRISOME PICTURE FOR STATE'S TRANSITION TO CARBON NEUTRALITY**

The *Index* found that renewable energy as a share of California's total power mix rose just 0.5% to 33.6% in 2021—even as the state repeatedly faced electricity supply shortfalls during climate-fueled heat waves, underscoring the need for more renewable energy resources. Since 2017, California's pace of renewable energy growth has been slower than the U.S. average, and this year's *Index* finds that the state is now at risk of missing its Renewable Energy Portfolio (RPS) standard target of 50% of energy from renewable sources by 2026.

The impact of not having enough renewable electricity was visible in the state's increase in in-state power sector pollution, which rose 6.3% in 2020, due to increased reliance on natural gas power plants.

“For the first time, the state is at risk of missing its renewable energy targets. It is imperative that the state re-double its efforts to increase new, clean electricity generation to keep up with growing demand in buildings and transportation,” said Perry.



One bright spot in an otherwise worrisome picture for California’s transition to clean electricity is the state’s rapidly-expanding battery storage capacity, which increased by 7.5 times in 2021 compared to 2020—a record high. Battery storage has provided urgently-needed grid resiliency benefits, especially in the evening hours, when California’s robust supply of solar energy begins to drop off.

**Key findings include:**

- Emissions from California’s in-state electricity generation increased by 6.3% in 2020, due to increased reliance on natural gas power plants. However, emissions from the state’s total electric power sector (import and in-state) still ticked down by 1.1%, due to a significant 14.1% emissions reduction from electricity imports.
- For California to meet its 2026 goal of 50% of generation from RPS-eligible renewable sources, the share of electricity generation from renewables would need to increase by 8.3% each year from 2021 to 2026, revised upward from the 6.1% annual growth rate previously predicted in 2018.
- Ongoing drought is significantly hampering California’s electricity generation from hydroelectric. Small hydro made up just 1% of California’s total power generation in 2021—one of the lowest percentages since the RPS program’s inception in 2002.
- California now imports 30.1% of its electricity supply from neighboring markets, with about 61% coming from the Southwest and 39% from the Northwest.
- Electricity generation from RPS-eligible renewable sources and large hydroelectric power made up 42.9% of the power mix in 2021, a slight decrease from 45.3% the year before.
- Electricity curtailment—or the deliberate reduction in output below what could have been produced due to a misalignment between electricity supply and demand—spiked in 2022. As of October 2022, 56.6% more electricity was curtailed than in 2021. Continued investment in battery storage can help reduce the need for curtailment by storing electricity for use during high-demand hours.

**ELECTRICITY FOR HOME HEATING TAKES OFF, IN A TREND LIKELY TO ACCELERATE**

The *Index* found that electricity or solar energy use for home heating surged 7.5% in 2021—the most substantial long-term growth among all other fuels. This increase is set to accelerate in coming years, as local and state commitments to phase out polluting natural gas in buildings take hold. In 2022, California adopted a first-in-the-nation commitment to phasing out the use of gas furnaces and water heaters by 2030.

Electricity or solar energy is also the fastest-increasing primary heating fuel among renter households, increasing by 25.3% between 2008 and 2019, and continuing to rise in 2021



(+39.3% in renter-occupied units; +38.8% in owner-occupied units). Renter-occupied units (40.9%) were about twice as likely to be powered by electricity or solar energy than owner-occupied units (21.4%) in 2021.

**Key findings include:**

- Emissions from the use of Substitutes for Ozone-Depleting Substances (substitutes for ODS) are the fastest-growing source of emissions in California. In 2020, GHG emissions from substitutes for ODS from all economic sectors accounted for 5.6% of total included statewide emissions, up from the 2019 share (4.9%) and a considerably larger share compared to 2010 (2.9%) and 2000 (1.2%). This year, the U.S. finally moved to ratify the global agreement to phase out the use of hydrofluorocarbons (HFCs) known as the Kigali Amendment to the Montreal Protocol—joining the global effort to tackle this concerning source of climate pollution.
- Natural gas combustion in the residential sector declined by 0.64% from 2019 to 2020.
- Emissions from the residential and commercial sectors were down by 0.7% and by 4.1%, respectively, in 2020 compared to 2019.
- Natural gas consumption (per capita) in the residential sector was 21.6% lower in 2020 than in 2000—suggesting both a gradual gain in efficiency and a shift towards electricity for heating.

**WILDFIRE EMISSIONS HIGHER THAN EVER, IN MAJOR CLIMATE CHALLENGE**

The *Index* found that emissions stemming from wildfires broke new records in 2020, totaling over 127 MMTCO<sub>2e</sub>—more than any other sector except for transportation, and a roughly 16% percent jump in comparison to 2019. At the moment, wildfire emissions are not included in the GHG emissions inventory, however, CARB has started a process to include wildfire emissions in its future scoping plan outlining the pathway to achieving carbon neutrality by 2045.

“Emissions from wildfires threaten to undo the work the state has done to reduce emissions across the economy. Recent state budgets have included funding to reduce the risk of wildfires, and the state is working earnestly to reduce the number and severity of fires,” said Perry. “We need to take both the source of emissions, and the root cause of climate change, of this crisis seriously.”

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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.

### About Beacon Economics

Founded in 2007, Beacon Economics, an LLC and certified Small Business Enterprise with the state of California, is an independent research and consulting firm dedicated to delivering accurate, insightful, and objective economic analysis. Leveraging unique proprietary models, vast databases, and sophisticated data processing, the company's specialized practice areas include sustainable growth and development, real estate market analysis, economic forecasting, industry analysis, economic policy analysis, and economic impact studies.