

ASSESSING CALIFORNIA'S EFFORTS TO ADDRESS THE RISKS OF CLIMATE CHANGE

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For the last two decades, the state of California has led all other American states, as well as the federal government, in its commitments to addressing the risks of global climate change. The state's leadership in this policy area reflects its longstanding history as a pioneer in environmental regulation. Yosemite was the nation's first protected wilderness, and California enacted America's first statewide air pollution regulations as well as the nation's most extensive controls on coastal development. Automotive emissions controls began in California and were subsequently adopted by the rest of the United States.

Some of the California's most consequential climate change policy initiatives actually predate the emergence of this issue on the policy agenda. In 1982, the California Public Utilities Commission enacted "decoupling," which incentivized the state's utilities to meet energy demand by promoting energy efficiency and conservation rather than by building new power plants. In a similar vein, the state strengthened its energy efficiency building codes and enacted the nation's first energy efficiency standards for appliance.

These regulatory approaches and standards, which have been steadily strengthened, have played a critical role in stabilizing residential per capita energy consumption and making California the nation's second most energy efficient state, behind only Massachusetts. Through 2018, energy efficiency measures resulted in the reduction of more than 2 million metric tons of CO₂ emissions in California. Remarkably, California's power use has remained stable, even as the state's population and economy have continued to grow.

In 2002, the State Legislature directed the California Air Resources Board to limit greenhouse gas emissions (GHG) from automobiles, marking its first policy initiative to explicitly address the impact of climate change. The state's efforts to reduce GHG emissions from transportation have been wide-ranging. They include mandated reductions in fleet average emissions of carbon dioxide (a policy that is being challenged by the Trump administration), a Low Carbon Fuel Standard designed to increase the supply of and demand for vehicles powered by hydrogen and electricity, and financial and other incentives to promote the sale of zero-emissions vehicles.

With 600,000 zero emissions vehicles currently on the road—and with their sales steadily increasing—California is well on its way to achieving its goal of having 1.5 million such vehicles by 2025. However the state is likely to fall short of its broader goal of a 50 percent reduction in vehicle GHG emissions by 2025 because vehicle ownership rates are growing and many Californians are driving longer distances to work. Consequently, notwithstanding its several policy efforts, GHG emissions from transposition are increasing.

A cornerstone of California's commitment to addressing the impact of global climate change was the passage of the California Global Warming Solutions Act of 2006, also known as AB 32. This legislation established the goal of reducing the state's GHG emissions back to their 1990 levels by 2020, making it the most ambitious climate change legislation in North America. It also

required that one-third of all energy consumed by the state be produced from renewable sources by that date.

Pursuant to this legislation, CARB established a cap-and-trade program to drive improvements in energy efficiency by pricing the GHG emissions produced by the state's manufacturing firms, utilities, and distributors of transportation fuel and natural gas. The GHG emissions covered by the program were capped and were then required to be steadily reduced. Revenues from cap-and-trade—which have totaled \$3.4 billion—have been used to improve energy efficiency in homes and public buildings, to plant trees in urban areas, to subsidize the sales of zero-emission and plug-in hybrid vehicles, to purchase more fuel-efficient buses, and to fund the state's high-speed rail project. These multiple "California Climate" investments have reduced GHG emissions by 36.5 million tons.

California met its 2020 GHG reduction targets by 2016—four year ahead of schedule. Since 2006, the state's overall GHG emissions have declined 13% and its per capita emissions by three tons. That means the state is using less carbon to support its economy, which has increased in size by 46 percent since 2000.

Much of this carbon reduction is due to the decline in GHG emissions from electric power generation, which have fallen by half since 2008. This fall, in turn, is primarily linked to the steady growth of renewable energy. Since 2002, the use of such energy has tripled: solar, wind, biomass and geothermal now meet more than a third of the state's energy demand. The state is home to the nation's largest wind farm and the world's largest solar thermal plant. In 2018, the state required that all new homes be equipped with solar power.

Building on its successes and increased public concern about the risks of climate change, the state has made its climate goals more ambitious. In 2017, California enacted legislation requiring GHG emissions to be reduced 40 percent below 1990 levels by 2030; half of its energy must be produced by renewables by that date.

In 2018, the state went a step further by requiring that the production of electrical energy be 100 percent renewable or from carbon free sources by 2045. This represented a step toward the ultimate objective of cutting GHG emissions to 80 percent below the level of 1990, which was the goal envisioned in the 1997 Kyoto climate treaty.

Achieving California's more immediate 2030 goal will require that the state double its rate of emission reductions over the next decade. Whether this is feasible remains unclear. One ongoing challenge has to do with transportation. Californians may care about the environment, but they also drive more than 300 billion miles a year and zero-emissions vehicles still represent a small portion of new vehicle sales. Only 10 percent of travel is on public transit, and building high density housing close to bus and rail lines remains controversial in many urban communities. While the costs of renewable energy have steadily declined, an important constraint on its continued growth is the lack of adequate and reliable storage capacity—as well as space to build more solar plants and wind farms.

The state will also be challenged to increase the energy efficiency of its buildings and address the emissions from agriculture—all of which it needs to do to achieve its 2030 goals as well as those beyond. Reducing emissions from industries such as oil drilling and cement production requires new technologies that do not yet exist.

But even if California falls somewhat short of any of its future GHG reduction goals—because the targets prove too expensive, technically unfeasible, or politically unpopular—California’s accomplishments to date demonstrate that GHG reductions can be significantly reduced without undermining economic growth. This is an important lesson from a state whose policy innovations other governments should learn from and emulate.