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It's New York vs. California in a New Climate Race. Who Will Win?

By Brad Plumer

California and New York have recently set some of the world's most ambitious climate targets, aiming to slash their net emissions of planet-warming greenhouse gases down to nearly zero in just three short decades.

Now the race is on to see if either state can pull off this feat — something that no major economy in the world has yet achieved. For now, neither state has a clear advantage, and both must overcome unique obstacles to clean up their power plants, cars and buildings. New York has the lowest per-person emissions of any state in the nation, but California is close behind.

New Yorkers love cars (slightly) less

Transportation is the single biggest source of climate pollution in both states: Cars, trucks, buses and planes are responsible for 41 percent of California's greenhouse gas emissions and 33 percent of New York's.

So far, California has moved more aggressively to address the problem, but has struggled to make progress. The state has passed dozens of clean-car laws and has approved at least $2.5 billion in incentives for electric vehicles and charging stations. But last year, electric cars made up less than 8 percent of new sales. And overall vehicle emissions have been rising in recent years as Californians drive more miles.

"One big lesson we've learned is that there's no single policy that will do the trick," said Daniel Sperling, founding director of the Institute of Transportation Studies at the University of California, Davis. Slashing emissions from vehicles, he said, could require a combination of many things, such as large-scale construction of charging stations for electric cars, the use of "congestion pricing" that sets fees for driving at peak times, and changes in urban planning that help more people live near and access public transportation.

New York won't find it any easier to coax people out of their gasoline-powered cars, and electric vehicles have an even smaller market share in that state. But it does start with one advantage: The average New Yorker drives one-quarter fewer miles each year than the average Californian, in part because so many people live in New York City, with its vast subway system.

California's sunny advantage

Both states have enacted laws requiring utilities to get the vast majority of their electricity from renewable sources by 2030. That means building lots of wind turbines and solar panels, and fast.

For now, California is in the lead.

Wind and solar have grown from a tiny sliver to 21 percent of the state's electricity mix over the past decade, as the costs of both technologies have plummeted. In New York, wind and solar are just 5 percent of the mix, and utilities will have to carve out their own path to catch up. The state isn't nearly as sun-drenched as California, but its coasts are more favorable for offshore wind turbines.

Yet as it races ahead, California is now facing new hurdles. For instance, it sees a huge surge of solar energy during the day that quickly fades by evening, just as people get home. So far, utilities have largely relied on generators powered by

burning natural gas (which emits carbon dioxide) to keep the lights on. They are now exploring strategies like using batteries to store solar power after dusk, or shifting the times when appliances like electric water heaters operate. But these challenges will only get tougher, experts say, as wind and solar keep growing.

New York will face its own set of decisions, like whether to keep its carbon-free nuclear plants online to help complement wind and solar. And managing costs will be a persistent concern: Both states already have some of the highest electricity rates in the nation.

Northeast winters are tough

One big source of emissions in both California and New York is the natural gas and fuel oil that gets burned in homes and offices for heat and hot water.

Both states are starting to replace gas furnaces with electric heat pumps and solar water heaters. But hurdles include not only the high upfront costs of these technologies, but also the need to find enough installers who can retrofit homes. There is also, potentially, a transition problem: Not everyone will go electric immediately, and in the meantime, the dwindling number of gas customers may have to pay higher costs to maintain the existing pipeline network.

"This is more of a policy problem than a technology problem," said Timothy O'Connor, senior director of the Environmental Defense Fund's energy program in California. "But we're learning a lot about how complicated it can be to get the policy right."

New York has an additional complication: Unlike in California, winters can be harsh, and heat pumps often need backup on the very coldest days. One possibility is that New York may explore the use of renewable natural gas, or methane captured from farms or landfill. There's likely not enough of it to heat every building, but it could prove useful for the homes that are toughest to heat with electricity alone.

Heavy industry is hard to clean up

One big difference between the two states is that California, the nation's largest manufacturer, has a lot more heavy industry, including cement, chemicals and oil refining. In New York, industry only makes up 11 percent of emissions but in California that number is 23 percent.

A recent report by the Energy Futures Initiative, a nonprofit research group, warned that it could be hard for California to drastically reduce emissions from industry without advanced new technologies. That might include capturing the carbon dioxide produced by cement plants and storing it underground, or developing renewable hydrogen that can be burned to produce the very high temperatures needed for processes like metal smelting.

"Industry is one of the toughest sectors to decarbonize," said Melanie Kenderdine, who directed the report. "Eventually, you're going to need breakthrough technologies."

But, she added, the state is also in a good position to lead in this research. "California has four national labs and the most research universities of any state in the country," she said.

New York can learn from California

When New York's lawmakers passed a bill last month requiring that the state get to net-zero emissions by 2050, they mostly left it to regulators to figure out the nuts and bolts of how to actually do it.

Here, the state could study the successes and failures of California, where the state's Air Resources Board has, for more than a decade, been pursuing detailed plans and policies for cleaning up different sectors of the economy.

While many of those policies are already having an impact, California has also had some early

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stumbles:

- Its cap-and-trade program, which requires large companies to pay for the carbon dioxide they emit, was initially too weak to have a big effect.

- A law aimed at nudging cities to reduce their reliance on driving has proved insufficient.

- Many of the state's early climate policies, like incentives for rooftop solar panels and electric vehicles, mostly benefited wealthier residents. Policymakers are now trying to help these technologies spread more equitably.

"California's climate change law got into a lot of trouble with the environmental justice community," said Michael Gerrard, director of the Sabin Center for Climate Change Law at Columbia University. But, he noted, there were signs that New York is trying to learn from that experience, as its latest climate bill tried to explicitly address concerns about equity.

California has also not always been as rigorous as it could be about scrutinizing the cost-effectiveness of its climate policies after they've been adopted, said Severin Borenstein, director of the Energy Institute at the University of California, Berkeley's Haas School of Business. That's something he hopes both states will pay closer attention to going forward.

After all, the two states account for only a tiny portion of global emissions. That means the biggest value of their work is "knowledge-creation — learning what works and what doesn't in two states with very different climates and economic patterns," Mr. Borenstein said. "In some ways, that's even more important than whether they hit their goals exactly."

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