



America's top CLIMATE COP

The United States has abandoned comprehensive greenhouse-gas curbs, but California is pressing ahead. Mary Nichols is leading the fight against emissions.

BY JEFF TOLLEFSON

Mary Nichols can take some pride in the view as she travels out of Los Angeles. The San Gabriel Mountains rise up to the north, framed by blue sky with just a touch of midday haze. The clear vista comes in large part because of the California Air Resources Board (CARB), the agency that Nichols leads, which has spent decades cleaning up the city's air. Now she and her team are setting their sights even higher — with an ambitious plan to cut California's greenhouse-gas emissions.

With an economy that outranks all but eight countries, California is a political and economic heavyweight that has never been afraid to flex its muscles. It is big enough to make an impact, and now that politicians in Washington DC have abandoned attempts to enact a national climate law, California is forging ahead on its own. Nichols feels the burden of that strategy acutely, and she is well aware of the challenges ahead.

In the run-up to the state elections last November, many feared that Californian voters would follow Washington DC's lead and cast aside the state's landmark climate legislation,

AB 32. The 2006 law requires a 10% reduction in greenhouse-gas emissions by 2020, and critics — fuelled in part by donations from the fossil-fuel industry — argued that the state's economy was too fragile to withstand aggressive new regulations. But voters turned out en masse to preserve the initiative, which is the first comprehensive climate programme in the United States. California has committed to reducing emissions by the same percentage as the European Union, and the state's unique plan could chart new ground internationally.

Since the 1970s, California has pushed the boundaries of environmental regulation, acting out of both pride and self-preservation. The state has pioneered environmental laws targeting air pollution, water contamination and toxic chemicals. It has advanced the sciences of atmospheric physics and chemistry, developed pollution-control technologies and bullied powerful industries into submission in an epic battle against choking smog in the Los Angeles basin. Other states, and eventually the nation, have followed California's path in

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developing regulations to control pollution.

But Nichols and her staff at CARB need to go even further to rein in greenhouse-gas emissions. The agency plans to clean up vehicle fuels, promote renewable energy and squeeze more reductions by improving energy efficiency. It is also designing the world's most comprehensive carbon market, set to launch at the start of 2012. Nichols believes that California will one day be able to demonstrate to the rest of the country how environmental protection and economic growth can coexist.

"People in this state are bullish on the ability of California to survive and change, and they fundamentally care about air pollution and environmental issues," says Nichols. "What we do here matters."

From Washington DC to Brussels and Beijing, government leaders will monitor the state's progress closely. Henry Derwent, president of the International Emissions Trading Association based in Geneva, Switzerland, says that California's plans are reassuring governments around the world that all is not lost in the United States. "The overriding feeling in Europe at the government level is relief," says Derwent. "Even though it's not the entire United States, it's a pretty big consolation prize."

CHARM OFFENSIVE

On this day in February, Nichols is travelling from her office in Los Angeles to a conference on sustainable growth at the California State Polytechnic University in Pomona. But the route along Interstate 10 illustrates the scale of the problem. The greater Los Angeles urban area sprawls outwards through towns and cities, filled with millions of people who love their vehicles.

Despite that, Los Angeles has managed to clean its air through a productive interplay between technology and environmental policy. Nichols says that modern vehicles produce 1% of the toxic pollutants emitted by their forerunners in 1975. The city's population has doubled since then and the use of vehicles has grown at an even faster rate, yet the air just keeps getting cleaner.

But CARB now faces a bigger and broader challenge. If no action is taken, California's emissions are projected to climb from 474 million metric tonnes of carbon dioxide equivalent in 2008 to 596 million metric tonnes in 2020. To reach the target set in AB 32, Nichols and CARB must get the total down to 427 million metric tonnes, the amount that the state was emitting in 1990 (see 'Cleaning up California'). To do that, they need to make emissions reductions everywhere they can, and that is what brings Nichols to Pomona.

She is addressing the small conference regarding one of the latest tools in CARB's belt: SB 375, a 2008 law requiring the agency to set targets for greenhouse-gas emissions from vehicles in all metropolitan areas. Her team set those targets last September, and the local and regional planning organizations must now develop strategies to meet them by, for example, promoting public transport, bike lanes and mixed-use zoning that brings amenities to people instead of forcing them to drive.

CARB set a 13%-reduction target for the area that includes Los Angeles, but many local officials complained that the state was imposing costly rules without providing any money to help them comply. Nichols knows that some of those officials are in the audience, and she has come in peace. As she steps up to the microphone, she gives a confident smile and disarms the sceptical leaders by acknowledging that the law's future is in their hands. "You could probably ignore it," she says, scanning the quiet audience for a reaction. "Nothing will happen, as far as I can tell."

Nichols then launches into a pep talk. SB 375 is not a top-down state solution, she says, but a bottom-up tool to help local and regional governments make their communities into more livable places, where people walk and exercise and spend more time with their families and less time alone in cars. This kind of master planning, she says, could set the stage for more organized — and less contentious — development because all parties would have agreed on the basic framework for growth. Nichols then ties up her talk by offering a small cash sweetener, in the form of grants to help local governments get the process started. There

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isn't so much as a peep of protest, and by the time lunch rolls around conversations are focusing on how to implement the law.

"If we see there is rising opposition, then we need to act and explain or make adjustments," says Nichols on her way back to the office. That kind of flexibility makes it easier for states than the federal government to negotiate difficult new regulations, she adds. "We are closer to the people that we regulate."

If Nichols makes it look easy, she has had a lot of practice. An environmental lawyer by training, Nichols is a diehard Democrat who has burnished her credentials working for environmental groups. She has also honed her diplomatic skills in various government posts, including a previous stint as head of CARB, from 1979 to 1983. She eventually rose to assistant administrator of air and radiation at the US Environmental Protection Agency (EPA) in 1993, under President Bill Clinton. For Nichols, these political appointments always represented an opportunity to put ideas into practice and put her stamp on the world.

"PART OF BEING A SUCCESSFUL LEADER IS HAVING FOLLOWERS."

By the time the California legislature enacted AB 32 in 2006, Nichols was ensconced in academia as director of the Institute of the Environment at the University of California, Los Angeles. She wasn't looking for a job when

Republican governor Arnold Schwarzenegger asked her in 2007 to take over CARB and find a way to meet the target, nor was she particularly thrilled about going to work for a Republican film star. She jokes that when she met Schwarzenegger, she interviewed him for the job, and he passed the test. Convinced that he was genuinely interested in making the programme work, Nichols jumped back into government.

IN THE DRIVER'S SEAT

CARB's plan bets heavily on innovation, some of which the agency is developing and testing at its own facilities. Nichols spends much of her time working from CARB's main science laboratory in El Monte, east of central Los Angeles. This is where agency engineers invented the check-engine light in the 1980s to alert drivers to problems with their vehicle's pollution-control systems. CARB is now developing automated sensors that will allow technicians to more accurately track emissions data in cars using a secure onboard computer. Engineers are busy analysing emissions from advanced vehicles, testing the performance of hybrid electric cars and studying how various technologies could help the state to meet its 2020 goal and a further, non-binding commitment to reduce greenhouse-gas emissions by some 80% by mid-century.

The most ambitious element of CARB's plan is an overarching cap-and-trade programme that will cover roughly 85% of the state's emissions by 2015. Under that system, the state will issue a set number of allowances — initially for free but later through an auction — that companies will need to cover their greenhouse-gas emissions. The total number of permits will decrease each year, and companies will need to either reduce their emissions or buy spare allowances from other companies that have made reductions more cheaply.

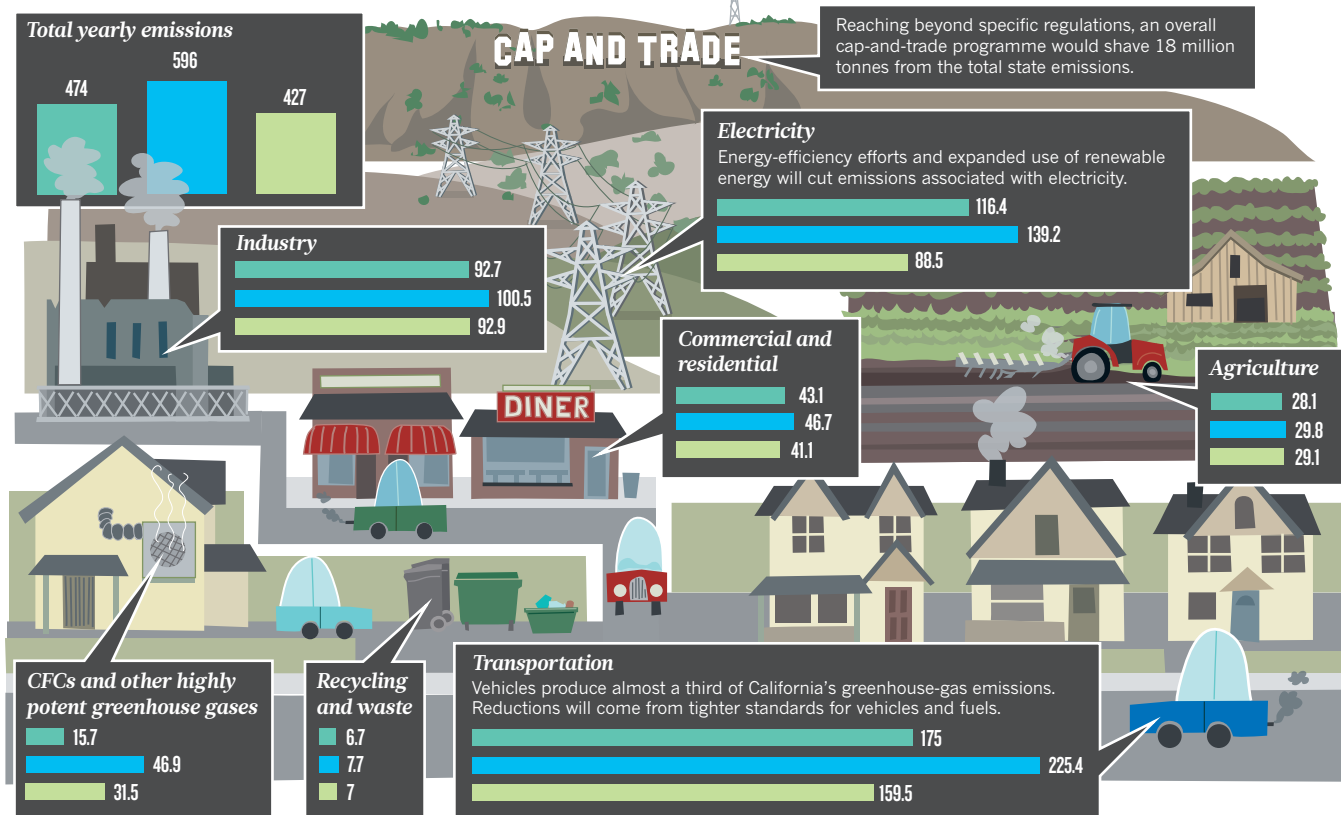
The cap-and-trade programme is an insurance policy. On their own, individual regulations for vehicle efficiency, renewable energy and other items will lower emissions, but they do not guarantee that the state will meet its targeted reductions. The cap-and-trade programme should — if it ever gets off the ground. In March, a California judge determined in a preliminary finding that CARB had failed to do a proper environmental analysis of the programme. The agency is now awaiting a final ruling on how to proceed, but CARB officials hope that the programme will move forward on schedule to begin next year.

Meanwhile, the agency is pressing ahead with other bold plans. CARB is working with partners in Brazil and Mexico to design what would be the world's first market-based programme to allow businesses to offset their emissions by protecting tropical forests. The agency is also establishing another type of offset, involving ozone-depleting compounds



CLEANING UP CALIFORNIA

A state law mandates that California must shrink its greenhouse-gas emissions by 28% from the levels currently projected for 2020. It plans to do this through regulations targeting individual sectors, in combination with an overarching cap-and-trade programme, which imposes a cost on emissions.



such as chlorofluorocarbons, which are powerful greenhouse gases not included in the United Nations' 1997 Kyoto Protocol for reducing greenhouse-gas concentrations. Companies in California could avoid reducing their emissions of carbon dioxide or other Kyoto gases by curbing — or paying someone else to curb — their emissions of the non-Kyoto greenhouse gases, which are not targeted by a more limited cap-and-trade scheme launched by the European Union in 2005.

CARB is trying to avoid pitfalls revealed by the European programme. That scheme, for example, initially issued too many allocations, which led to a collapse in the price of carbon. CARB is taking care to keep an inventory of emissions, so that it can issue an accurate number of initial allowances. But the inventory is calculated in part from figures provided by polluters, so CARB is also carrying out an independent check, funding scientists to measure concentrations of greenhouse gases and other pollutants in the field and then calculate emissions from that data. Already, CARB knows that methane emissions around Los Angeles are higher than the inventory suggests.

Nicholas Bianco, a senior associate at the World Resources Institute in Washington DC who advises agencies on emissions reduction, says that the California cap-and-trade scheme represents a major step forward. "It will be the first of its kind in the world."

James Sweeney, director of the Precourt Energy Efficiency Center at Stanford University in California, says that what is happening in the state is exciting, but he has two fears. The first is that funding for energy and climate research will dry up in the current budget crisis, making the challenge of meeting long-term greenhouse-gas reduction targets in California and elsewhere even more difficult. The second relates to scale. California is important, but it represents just 7% of US emissions.

"The bottom line," says Sweeney, "is that if California is going to have a real impact it will be as the laboratory for the nation."

The chances of that happening are unclear. Northeastern states have a limited cap-and-trade programme for power plants, but western states have backed away from joining California's scheme — although at least

three Canadian provinces are expressing interest. California isn't big enough to run its own system forever, says Nichols, but the state will stay the course for now. She points out that the agency has history on its side.

When CARB published its first greenhouse-gas regulations for cars in 2004, it quickly ran into legal battles with the automobile industry and the administration of President George W. Bush. But last year, the Obama administration brought the various players together in a deal that essentially established CARB's vehicle regulations as national ones.

"When we started the first round of greenhouse-gas standards, the automobile companies wouldn't even talk to us," says Paul Hughes, who headed the effort as manager of the Low Emission Vehicle programme. Today, Hughes says, car makers are engaged at every step in the process as CARB and the EPA prepare to release identical new standards for California and the nation for model years 2017–25. Due late this year, those regulations are expected to translate into an average fuel-efficiency rating of 20–26 kilometres per litre for cars and trucks — a big jump from the current standard of less than 12 kilometres per litre. For Hughes, it is just a matter of time before other CARB policies diffuse outward and upward into the national scene.

On the drive back from Pomona, Nichols ponders the roller-coaster progress of the past few years. With Obama in the White House, it looked as if the United States was finally gearing up for a serious push on global warming. Then lawmakers rejected the idea, leaving California on its own.

The optimist in Nichols thinks that the United States will eventually find its way on climate. But she is also a realist and has a simple message for the rest of the country. "California set itself up to be at the head of what we thought was going to be a parade, but part of being a successful leader is having followers," she says. "At the end of the day, Californians are not going to accept a lonely role as the sole state in the union that is doing anything in terms of carbon." ■

Jeff Tollefson covers energy and environment for *Nature* in Washington DC.