

This page: Solar panels on display in Downtown Los Angeles
Opposite page: A Proterra electric bus en route in Stockton, CA.



California Advancing Rapidly Toward 100 Percent Clean Power

By John J. Berger, *Sustain Europe* U.S. Correspondent

Given the lack of climate leadership from America's Climate Denier-in-Chief, *Sustain Europe* continues its focus on the United States with some more sustainability news from across the pond. Our U.S. Correspondent, Dr. John J. Berger, takes a look at renewable energy and carbon farming in the Land of Dreams, California. As the world's fifth largest economy, California plans to become totally carbon-neutral by 2045 and carbon-negative thereafter. The state is also committed to getting 100 percent of its electricity from clean, renewable sources by then. California is one of the first regions in the world to get behind the measures we need to adopt in order to stay under 1.5° C

Whereas research reports by the world's most eminent climatologists seem almost daily to bring foreboding climate news, renewable energy proponents who met at UC Berkeley recently were decidedly upbeat about clean energy prospects.

The expert gathering, "Pathways to 100% Renewable Energy," was all about getting to 100 percent renewable, affordable, and reliable electricity for all.

Heightened Need for Clean Energy Action

Convened by the Renewables 100 Policy Institute of Santa Monica, CA, the day-and-a-half-long plenary was part strategy session, part victory lap, and part mustering evidence that speedily attaining 100 percent renewable power is feasible and practical.

Ken Alex, California Governor Jerry

Brown's senior policy advisor, began the meeting on a sombre note by telling the audience that we will likely lose the late-summer Arctic sea ice by 2050.

Loss of the ice darkens the surface of the Arctic, increasing the absorption of heat and amplifying global heating. New unpublished research, Alex said, indicates that Arctic sea ice loss will have a substantially more powerful heating effect on the Earth than generally realized.

Wind and Solar Outpace Fossil Plant Construction

Supporters of clean energy were nonetheless buoyed by the rapid technological progress and steep price drops in renewable energy and electric vehicles. Both utility-scale wind and solar

power have now become cheaper than coal and some natural gas power plants. More new wind and solar utility generation is now being built in the U.S. than fossil-fuelled plants.

In a keynote to the gathering, California State Sen. Kevin de León, until recently the Senate President pro tempore and now a candidate for U.S. Senate, shared his reasons for optimism about the transition to renewable energy.

Because the state's environmental and energy policies have turned environmental challenges into economic opportunities, he said, Californians now enjoy cleaner air, healthier water, and billions of dollars in savings on energy bills, keeping "Californians' energy spending among the lowest in the nation."

California Aims for Net-Zero Emission by 2045

In a major surprise move this September in addition to signing Senate Bill 100 which commits California to 100 percent renewable power by 2045, Governor Jerry Brown also issued Executive Order EO B-55-18. It commits the state to net-zero carbon emissions across all energy use by 2045 and to "net negative emissions thereafter," in addition to all the state's current emission reduction targets.

The new target is considerably more ambitious than the state's existing goals of reducing its emissions 40 percent below 1990 levels by 2030 and 80 percent lower by 2050. The 40 percent reduction goal is itself already the nation's most ambitious. The new target brings the state—the world's fifth largest economy—in line with the 2015 Paris Climate Agreement's effort to hold the global temperature rise to 1.5-2°C above pre-industrial levels.

Although California is currently still heavily dependent on fossil fuel, particularly on oil for transportation—the public drives 343 billion miles per year—the Governor's order directs the state to go carbon-neutral. That will mean essentially phasing out fossil fuels by 2045. While it does not explain how this is to be accomplished, the order directs the California Air Resources Board and other state agencies to develop an implementation framework and work toward implementing the goal.

The order also directs the state's Department of Food and Agriculture to support the goal through carbon storage in soils (see page 56) and forests. State agencies were further directed to seek broad participation from universities, businesses, investors, and communities in implementing the order. Addressing social equity issues, the Governor's order stipulates that the state's carbon neutrality policies "shall seek to improve air quality and support the health and economic resiliency" of low-income and disadvantaged communities. Because an executive order does not have the force of law, it could in theory be ignored

by Brown's successors in the statehouse and the legislature. In practice, that is unlikely given the widespread and intense concern in the state over the spate of megafires, drought, and other worsening manifestations of extreme weather (in some recent years, fires have emitted more carbon than state climate policies are removing from the air). Nonetheless, to guarantee full implementation of the executive order, legislative action will be necessary.

The order is sure to raise the cost of carbon credits under the state's cap and trade program and to gradually drive the state's fossil fuel sector out of business. Thus the state's powerful oil and gas industries—along with their refineries and the ports, railroads, trucking companies, and agribusinesses that depend on oil and gas—can be expected to mount stiff political resistance.

While Governor Brown's order is the most aggressive move any large state has taken against the fossil fuel industry, and the Governor has also opposed Federal offshore oil drilling, he has faced vehement criticism from his left flank.

Environmental justice activists representing low-income communities and people of colour—with support from U.S. Congressional representatives Ro Khanna and Barbara Lee of California—are pushing Brown to support a ban on fracking and to support phasing out the state's oil and gas industry by ending permits for new oil wells. They are also urging a health and safety buffer zone around oil wells that they say could keep 425 million metric tons of carbon in the ground.

The Governor's critics say that more than 21,000 new oil and gas wells have been drilled in California during the past eight years of his Administration. More than three-quarters of the wells are in low-income communities or communities of colour. Overall, more than 5 million California residents reportedly live within a mile of the state's 84,000 wells.

Economic and Job Growth Compatible With State's Clean Energy Goals

Since the state's Global Warming Solutions Act (AB 32) passed in 2006 establishing the state's cap and trade system, the state's per capita GDP "has grown by nearly twice the national average," de León noted, "and we've easily outpaced the nation in job creation."

De León singled out the state's decades-long record of passing the nation's toughest vehicle emission standards, coastal protections, and energy efficiency standards, along with some of the country's most ambitious clean energy goals.

At the forefront of these efforts, de León last year introduced Senate Bill 100 which would require California to get 100 percent of its power from renewable sources by 2045. [Editor's note: Since the Pathways conference, SB 100 was approved by the California legislature and in early September, it was signed into law by Governor Brown.]

"All the evidence suggests 100 percent clean energy is within reach," de León declared.

Whereas California is currently committed under SB 350 (also by de León) to getting 50 percent of its power from eligible renewables by 2030, SB 100 raises the 2030 requirement to 60 percent. Since large hydropower facilities are not currently considered to be newly "eligible renewables" and since the state's power mix was 15 percent hydro in 2016, by 2030 the state could already be getting at least 75 percent of its power from renewable and zero-carbon sources.

In addition, if carbon capture and sequestration could be done "in a way that is affordable and truly clean," de León said, "that would count under this bill," along with existing hydropower.

Under SB 350, California in 2015 raised its 2030 renewable electricity goal to 50 percent. The state's prior goal had been 33 percent renewables by 2020. California's major utilities are already close to or above

40 percent renewable power and will soon be at 50 percent.

The bill also calls for a 50 percent increase in energy efficiency in existing buildings and seeks to accelerate the electrification of the state's transportation sector.

Hawaii in U.S. Clean Power Vanguard

Representative Chris Lee of Hawaii told the conference that Hawaii—now at 30 percent renewable power—has committed to 100 percent renewables and to phase out fossil fuel power in ground transportation by 2045.

Lee said that while Hawaii is committed to 100 percent renewables by 2045, it will achieve it by 2040—and at a savings of \$5 billion, which is 8 percent of the state's GDP.

"Saving the climate is to preserve our way of life," he stated. "It is for our survival. These problems are [solvable]," he added. "Having the vision of getting to 100 percent renewable energy is what we need."

Like Hawaii, San Francisco has committed to getting 100 percent of its power from renewables by 2045. More than 50 other U.S. cities are also committed to 100 percent renewable power.

Five Million California ZEVs by 2030?

Much to the delight of renewable energy advocates, since electric vehicles can be powered by clean electricity, Governor Brown on January 26, 2018 issued an executive order raising the state's 2030 target from 1.5 million zero emission vehicles to 5 million. The order will also boost the supply of charging and refuelling stations for zero-emission vehicles (ZEVs), and it calls for the investment of \$1.25 billion in cap-and-trade auction revenues in combatting carbon pollution from cars and trucks.

Assemblyman Phil Ting of San Francisco told conferees, "If you want clean air, you absolutely have to have clean cars." According to the Governor's Office, fifty

percent of California's greenhouse gases currently come from the transportation sector along with 80 percent of its smog-forming gases. Ting is sponsoring a bill in the Assembly to ban internal combustion engines in California by 2040.

China, France, the U.K., India, and Norway have announced similar or earlier deadlines for phasing out internal combustion engines.

California already has almost 400,000 electric vehicles, and many jurisdictions are converting diesel bus lines to electric buses. Ryan Popple, president and CEO of electric bus company Proterra, told the conference that business is booming and the technology is improving rapidly, with battery electric buses now capable of eliminating their fossil-fuelled competitors.

Electric buses produced by 2020 will have a 225-mile range, he said, while most transit bus routes require less than 130 miles of travel per day. With electric drivelines now already cheaper than diesels, diesel and



compressed natural gas bus market shares "are going to go to zero," he predicted.

De León's closing remarks were an outspoken rebuke to President Trump. "If the President really wants to put people to work and make America the world's energy super-power, he should follow our lead . . . We didn't grow into the world's sixth largest economy and the epicentre of innovation by embracing 'alternative facts,' or pseudo-scientific nonsense."