<< Back to E&E Publishing index page.

CALIFORNIA:

How will the state get 50% of its energy from 'renewable resources' by 2050?

Debra Kahn, E&E reporter

ClimateWire: Wednesday, January 21, 2015

Gov. Jerry Brown (D) received plenty of early support for his proposal, in his Jan. 5 inaugural speech, to get half of California's electricity from renewable sources by 2030.

A lawyer who represents renewable energy developers said the media coverage of Brown's goal has sparked interest from the public as well as renewables advocates. "I've gotten several calls from landowners saying, 'I have land I'd like to lease to a wind developer, can you give me a call?'" said Jerry Bloom, chairman of the law firm Winston & Strawn's energy practice.

Observers say the goal -- as well as Brown's other inaugural pledges to halve petroleum use and double the efficiency of existing buildings -- points to sweeping changes in how California plans for and procures its energy.

Achieving 50 percent renewables by 2030 would be the most ambitious target in the country, by far. State energy experts hypothesize it may take more than merely expanding California's existing renewables portfolio standard of 33 percent by 2020.

Brown "did not use the words 'renewables portfolio standard,'" said Jan Smutny-Jones, CEO of the Independent Energy Producers Association, referring to the increasingly common policy, now in place in 29 states. It requires a certain percentage of electricity to come from renewable energy by a given year. "It's '50 percent renewable resources,' so what does that mean?"

An advocate for rooftop solar installations agreed that the 50 percent goal opens the door for new policies.

Re-creating the future

"That's the million-dollar question right now: What does this new policy framework look like, how much do we draw from the past, how much do we re-create for the future?" said Bernadette Del Chiaro, executive director of the California Solar Energy Industries Association.

Businesses in California have been thinking about this goal for some time. An analysis is well underway on how the state can cut its carbon footprint in half by 2030. It's being funded by about two dozen companies, trade groups and foundations with interests in large-scale renewable energy, including GE, Sunpower, NRG, BrightSource Energy, the American Wind Energy Association and the Energy Foundation.

Phase 1 of the study, conducted by the National Renewable Energy Laboratory, created two scenarios where the grid could use renewables, natural gas, energy efficiency, storage, and combined heat-and-power plants to reduce electric-sector emissions to 47 million metric tons of CO2 total -- 50 percent below 2012 emissions levels.

Phase 2, due out early this year, will include analyses of potential effects on reliability and utility rates.

V. John White, director of the Center for Energy Efficiency and Renewable Technologies, which is spearheading the study, said Brown's proposals -- which also include a pledge to halve petroleum use and double the efficiency of existing buildings -- could dovetail with existing efforts to set an overall 2030 emissions target for the state. A bill introduced in the state Senate last year by Sen. Fran Pavley (D), S.B. 32, would require the state's Air

Resources Board to approve a 2050 emissions target of 80 percent below 1990 levels and provides for interim targets in 2030 and 2040, as well (***E&ENews PM***, Jan. 5).

The eventual policy could be much broader than the current strategy of renewables procurement, which relies on the California Public Utilities Commission to approve contracts between developers and utilities based on lowest cost.

"While the 50 percent goal can be readily achieved, it needs to be achieved in the context of a greenhouse gas reduction target, and the means of achieving those renewables to get to the low-carbon number will require a different way of procuring than the compliance-based RPS," White said.

Policies will need to focus on not just increasing the amount of wind, solar, biomass, geothermal and other renewable sources, but also boosting energy storage and demand response so the grid can handle the influx of renewables.

"It has every opportunity to reignite the market and create demand for more renewables, but in my view, to be successful, it has to be organized around the goal of achieving the greenhouse gas reductions and using renewables, storage, demand response as the backbone of the grid and not just as an ancillary add-on," White said.

Wrestling with the 'duck curve'

California's grid is already experiencing the effects of surplus renewables.

Any discussion of integrating renewable electricity in California begins with an explanation of the "duck curve." For years now, state energy experts have been warning about the phenomenon, named after the shape that electricity supply and demand is taking as renewables ramp up during the middle part of the day.

That creates two problems: one, when renewables create a surplus that competes with traditional power plants, whose economics demand that they run continuously; and two, when the intermittent nature of renewables causes the quality of electricity to decline.

Four times this past spring, the state's grid operator had to shut off wind and solar power when it exceeded demand. The largest such curtailment was 1,100 megawatts during the morning of April 27, 2014.

"Grid operators are now seeing overgeneration beginning to manifest itself during the midday hours necessitating curtailments, just as the duck curve forecasted," said CAISO spokesman Steven Greenlee.

The plants that were curtailed likely received all of their contracted payments from the utilities, as contracts generally have a small curtailment provision built in. But as curtailment becomes more likely, contracts could become more flexible in the future, Bloom said.

"I think it means the contracts will allow for increased flexibility for dispatch by the utilities over time," he said. "There's a big change from the old days, when if you produced, they had to take it."

There will be a need to incorporate energy storage into renewables projects, as well. Right now, a solar project without storage would beat out one with storage solely on cost, even though utilities are under a new mandate as of last year to procure 1.3 gigawatts of storage by 2020.

"There's no value associated with solving the duck belly problem or being better integrated into the grid," Smutny-Jones said. That, too, can be dealt with through the procurement process, he said.

Another solution frequently mentioned is to use the excess midday renewable power for other things, such as charging electric vehicles or even desalinating seawater.

Energy storage and alternative uses

"This is an area we've been looking at internally as potentially a big opportunity," Smutny-Jones said. "The question is, can that power be utilized in a way that has some additional benefit, either economically or through the climate change issue?"

When asked whether he anticipated fossil fuel generators to oppose Brown's goal, Smutny-Jones said he didn't.

"No, I don't think so," he said. "I represent most of them."

The state already has very little coal-fired generation, due to the 2006 law S.B. 1368, which prohibits new contracts with power sources that generate more than 1,100 pounds of carbon dioxide per megawatt-hour. Coal-fired power totaled just 0.51 percent of in-state generation in 2013, according to the California Energy

Commission. Natural gas made up 60.5 percent of in-state generation.

"The simple fact of the matter is, California needs a clean gas fleet to keep the lights on," he said. "While the rest of the country is shifting from coal to gas, we've got a relatively clean gas plant that will continue to provide backup services when other renewable technologies aren't there to meet the overall load."

A manufacturing industry representative said he worried about the potential cost to electricity customers, particularly large-scale users.

"This is a difficult place to compete as a manufacturer, and it's getting harder," said Gino DiCaro, spokesman for the California Manufacturers & Technology Association, which includes such members as Anheuser-Busch, Boeing, Chevron, Kraft Foods and Kimberly-Clark.

He said California's industrial electricity rates are about 80 percent higher than the national average, and that part of the disparity is due to the existing 33 percent RPS. "We can't just make bold, ambitious goals without understanding exactly what they're going to cost our economy," he said.

Still, DiCaro praised Brown's approach thus far in terms of coordination between the roughly half-dozen state agencies that are involved in setting energy policy.

"The governor's office seems to be better coordinated wth all the different agencies than ever, and that's a good thing," he said. "We can't be lumping policy on top of policy to reach this goal."

Twitter: @debra_kahn | Email: dkahn@eenews.net