

Renewable energy bill far from perfect, experts say

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(Photo: Jay Calderon/The Desert Sun)

With one week until California's Legislature closes shop for the year, lawmakers are scrambling to pass an ambitious climate and energy plan. At stake are several top priorities for Gov. Jerry Brown: a 50 percent cut in oil use, a 50 percent increase in energy efficiency in existing buildings, and a 50 percent clean energy mandate.

Some version of the bill will almost certainly pass, despite aggressive opposition from the oil industry and objections from centrist Democrats. There has been little formidable opposition to the clean energy mandate, which is expected to jump-start solar and wind development in the desert and across the state.

But for some clean energy experts, the bill leaves a lot to be desired.

Critics say the bill doesn't do enough to promote clean energy sources that can generate electricity around the clock, including geothermal, biomass and solar with storage. Adding those kinds of power sources to the mix, they say, is needed to keep electricity costs down for homes and businesses, while limiting the carbon pollution responsible for climate change.

"Sometimes the legislative process takes a while to catch up to new information and new developments," said V. John White, executive director of the Center for Energy Efficiency and Renewable Technologies, a trade group. "The governor has not done a really good job of articulating much more than the big picture."

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At the Ivanpah solar plant in San Bernardino County, mirrors focus sunlight on boilers at the top of solar power towers on Oct. 21, 2014. (Photo: Jay Calderon/The Desert Sun)

Even those critics overwhelmingly support SB 350, formally known as the Clean Energy and Pollution Reduction Act. They're confident that California will eventually diversify its clean energy sources, rather than continuing to focus almost exclusively on traditional solar farms and wind turbines, which can't provide power around the clock.

Making that transition a top priority for Assemblymember Eduardo Garcia, a Coachella Democrat who wants to see more geothermal energy plants built along the southern shore of the Salton Sea. Garcia called SB 350 "a good first step."

"There's always more to be done," Garcia said in an interview Wednesday. "The bill isn't completely in its final form. We've got today, tomorrow and five days next week to try to get there."

Anything could change before next Friday. But for now, some critics see the bill as a missed opportunity to limit global warming while keeping electricity costs as low as possible.

Costs and carbon

Traditional solar panels and wind turbines don't contribute to climate change and don't emit local air pollution — and they're getting cheaper all the time. But those resources can't power society alone, because they only generate energy when the sun shines or the wind blows.

If a cloud passes overhead, or the wind dies down, power companies need another energy source ready to go on short notice. Right now, electricity providers usually use natural gas-fired "peaker plants," which can be turned on and off quickly.

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The 800-megawatt Sentinel power plant in Desert Hot Springs, which burns natural gas, is designed to provide power during blackouts and when demand exceeds supply. (Photo: Jay Calderon/The Desert Sun)

Burning natural gas is less damaging to the climate than burning coal or oil. But it still contributes to climate change, not to mention spewing unhealthy particulate matter into the air.

Another problem: Building gas plants that only turn on occasionally is expensive. Several studies have found that a diverse mix of clean energy sources is the cheapest way to get California to its 50 percent target.

"As more and more renewables get added to the power system, it becomes more and more important to think about how those will be integrated, what other technologies you might need, what changes to the current market system might be needed," said Arne Olson, a partner at Energy + Environmental Economics, a consulting firm.

Building more clean energy will almost certainly lead to higher electricity prices. Experts say those costs will pale in comparison to the benefits of limiting climate change, which is already wreaking havoc on public health, the economy and the environment.



Wind turbines and solar panels dominate the landscape along Interstate 10 near Palm Springs on Oct. 21, 2014. (Photo: Jay Calderon/The Desert Sun)

But the exact costs of transitioning to clean energy are still up in the air.

In a [2013 study \(https://ethree.com/documents/E3_Final_RPS_Report_2014_01_06_with_appendices.pdf\)](https://ethree.com/documents/E3_Final_RPS_Report_2014_01_06_with_appendices.pdf), Olson's firm found that getting to 50 percent using a "diverse" approach — include more geothermal, out-of-state wind and solar with storage — would raise energy prices about 9 percent. Continuing to rely mostly on traditional solar and wind farms, the study found, would cause a jump of 14 to 16 percent.

"How are we going to make sure that we build enough renewables in the most cost-efficient manner possible?" Olson asked.

Spokespeople for Brown and California Senate leader Kevin de León, SB 350's author, declined to comment for this story.

Reasons for optimism

Under California's current renewable energy mandate — 33 percent by 2020 — utility companies have largely opted for traditional solar and wind farms, because they have the lowest up-front costs.



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Clean energy sources that provide electricity around the clock — like geothermal and solar with storage — typically have higher up-front costs. California's current renewable energy mandate requires utilities to buy the cheapest power on the market, usually meaning traditional solar and wind.

SB 350 mostly leaves that system in place, but it would instruct utility regulators to consider the benefits of round-the-clock clean energy sources. Most of that language comes from a [bill introduced by Garcia earlier this year \(/story/news/environment/2015/02/02/developers-local-lawmaker-look-clean-energy-goal/22750773/\)](/story/news/environment/2015/02/02/developers-local-lawmaker-look-clean-energy-goal/22750773/), which was intended to boost geothermal development by the Salton Sea.

"Eddy Garcia has more than anybody contributed to making (SB 350) better," White said.



A geothermal power plant on the southern shore of the Salton Sea is visible from Red Hill Bay on Dec. 14, 2012. (Photo: Omar Ornelas/The Desert Sun)

Garcia said he's still trying to get an amendment that would require some new geothermal energy. Even if that doesn't happen, state officials could push for a cheaper, more diverse clean energy mix in several other ways.

For one thing, the California Public Utilities Commission is currently developing a mechanism to calculate the "integration costs" of different renewable energy sources. This would allow utilities to penalize intermittent sources and give more credit to non-intermittent sources when deciding what kind of clean energy to buy.



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At the same time, the California Independent System Operator — the nonprofit corporation that manages most of the state's electricity grid — is working on plans to share electricity with five other Western states. That would make it easier for California to export clean energy when it has more solar or wind power than it knows what to do with, and to import clean energy from other states at other times.

Right now, solar and wind farms that generate more energy than needed are sometimes forced to shut down, a phenomenon known as "curtailment." It's a waste of money and a waste of clean energy, said Laura Wisland, a senior energy analyst at the Union of Concerned Scientists, a nonprofit advocacy group.

"If we can work more closely with our neighbors — and export some of the solar in the middle of the day, if we can't find a use for it and other people can — we don't have to curtail the renewables," she said.



A row of solar panels reflects clouds overhead at the 550-megawatt Desert Sunlight solar farm in Riverside County. It's one of 52 large-scale renewable energy projects on federal land approved by President Barack Obama's administration. (Photo: Crystal Chatham/The Desert Sun)

On its own, SB 350 is "clearly an advance over what exists today," said James Caldwell, a senior technical consultant at the Center for Energy Efficiency and Renewable Technologies. But California must adopt a smarter way of doing things in the next few years, he said.

"I don't think it goes far enough to get where it needs to be in the 2030 time frame. But there's plenty of time to come back and fix it in that time frame," Caldwell said. "Let's get this thing passed and move on."

Rooftop solar

Some round-the-clock clean energy sources have generated controversy for environmental reasons.

Take solar "power tower" projects, like the [Ivanpah power plant in San Bernardino County](/story/tech/science/energy/2014/10/25/tough-road-ahead-concentrated-solar-power/17929439/) (/story/tech/science/energy/2014/10/25/tough-road-ahead-concentrated-solar-power/17929439/), near the Nevada border. It's easier and cheaper to store energy from power towers than it is to store energy from traditional solar panels, but the technology has been criticized for its propensity to kill large amounts of birds.

Then there are "pumped storage" projects like Eagle Mountain, the large hydropower plant that a developer is trying to build near Joshua Tree National Park. Eagle Mountain could store clean energy for use when the sun goes down or the wind stops blowing, but it would drain billions of gallons of groundwater from an underground aquifer.



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[Eagle Mountain hydropower plant takes big step forward](http://www.desertsun.com/story/news/environment/2015/07/01/eagle-mountain-hydropower-plant-takes-big-step-forward/29597953/)

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Some environmental activists, especially in the desert, argue that California shouldn't be building large-scale clean energy plants at all. Instead, they say, the state should focus all its resources on promoting rooftop solar, which doesn't harm desert ecosystems and doesn't require expensive transmission lines.

"It is overwhelmingly more cost effective to do rooftop installations in the urban cores themselves," said Bill Powers, a San Diego engineering consultant and rooftop solar advocate. "No one who is looking at the big picture, and cared about the economics of renewable energy development, would choose to go with large-scale solar in the desert that requires new transmission."



Solar panel installers with Hot Purple Energy (Paul Lemon, right, of Morongo Valley and Phillip Wittwer) bolt on solar panels in a 54 panel home installation job in Rancho Mirage, Wednesday, May 23, 2012. (Richard Lui/The Desert Sun) (Photo: Richard Lui/The Desert Sun)

Olson's consulting firm, Energy + Environmental Economics, has come to a different conclusion.

The firm found that getting to 50 percent largely with rooftop solar would raise average electricity rates for all homes and businesses by about 23 percent — higher than the cost increase in other scenarios, even when transmission is taken into account. That's because building many small rooftop solar installations is more expensive than building a single solar plant that generates the same amount of energy.

Powers has criticized Energy + Environmental Economics, which he says is beholden to the power companies and state agencies who provide most of its business. Those clients, he said, are biased against rooftop solar because it threatens the utility industry's traditional business model.

"The real golden egg for the utilities is the transmission lines," Powers said.

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A creosote bush is dwarfed by transmission towers and lines that carry electricity along the I-10 corridor 45 miles east of the Coachella Valley. (Photo: Jay Calderon/The Desert Sun)

While most experts don't think rooftop solar alone is the best way to meet California's energy goals, they generally agree that large-scale power plants aren't enough, either. Slashing the greenhouse gas emissions that are heating the planet — and doing so in the least expensive way possible — will require as much low-carbon energy as possible.

"In the future we're going to have to choose renewables based on how they help us meet greenhouse gas reductions, and how they help us increase

reliability," said White, from the renewable energy trade group. "Right now those factors are not addressed."

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