



California's forays into clean energy haven't dampened its juggernaut economy, which rebounded from the recession significantly faster than the national average.

## California raises the caution flag on 'green jobs'

Democratic candidates' promises of a clean-energy boom range from modest to outlandish, but California's experience suggests they won't match reality.

SACRAMENTO — California's mixed record of using public investments and environmental mandates to create "green jobs" raises serious questions about the promises of some Democratic presidential candidates to use economy-transforming investments in environmentally friendly technologies to put millions of people to work.

Many of the initiatives touted by the candidates in their environmental plans are already in place in California, and some of them having been promoted as important engines of job creation. But California

stopped counting green jobs in 2013, struggling to separate truly new jobs from existing employment growth.

Nonetheless, candidates have been competing with each other to tout clean energy investments and policies as an economic engine. Elizabeth Warren's (D-Mass.) plan envisions spending \$2 trillion and creating 1.2 million jobs through 2029. Tom Steyer's would deploy \$2.3 trillion and create 1 million jobs via a "Civilian Climate Corps." Bernie Sanders' (I-Vt.) tops them all, vowing to spend \$16.3 trillion and

create 20 million jobs. Beto O'Rourke's \$1.5 trillion plan doesn't have a specific jobs number attached, while Sen. Kamala Harris' (D-Calif.) [touts](#) "millions of new jobs."

Each announcement has generated splashy headlines, as in the case of Warren's plan to spend \$1.5 trillion on federal procurement of domestic cleanly produced products, \$400 billion on research and development and \$100 billion on helping other countries buy American-made clean tech.

"With big and bold investments in American research, American industry, and American workers, we can lead the global effort to combat climate change — and create more than a million good jobs here at home," Warren [wrote](#) in June on the release of her plan.

As California's experience shows, reality doesn't always live up to projections. And while some of the most conservative estimates, like Warren's and Steyer's, appear reasonable based on California's record, the state's experience also reveals just how modest — and unimpressive — those goals would be for a 10-year period.

Most of the proposals being floated by candidates have analogues in California, which is now a decade into its quest to prove that economic growth and greenhouse gases are not inextricably linked. Where Biden wants to install 500,000 electric vehicle charging outlets by 2030, California has a target of 250,000 by 2025. Where Washington Gov. Jay Inslee had wanted to make new buildings zero-carbon by 2030, California has net-zero energy efficiency standards that require solar panels on all new homes. Where Warren proposes a National Institute of Clean Energy to fund cutting-edge research, California has its state Energy Commission, which spends some \$250 million per year on grants and incentives for everything from batteries to hydrogen stations to electric school buses. Warren, Steyer and O'Rourke's "buy clean" requirements for the federal government match California's 2017 law requiring public projects to use low-emission steel, glass and insulation.

California's experience is that jobs have materialized, but that it's been more trouble than it's worth to count them in the aggregate. While "green jobs" were the common argot in 2009, when Obama's American Recovery and Reinvestment Act injected \$790 billion

into the economy, the term has fallen out of favor since — as has calculating its number.

The federal Bureau of Labor Statistics stopped tabulating green jobs in 2013, as did California's Employment Development Department after it [found](#) "no discernible evidence that green firms were more likely to create jobs than non-green firms." A 2008 California law required the creation of a "green-collar jobs council" and annual reports to the legislature, but they dropped off in 2010.

"Green jobs' is a strange and somewhat elusive category," said University of California, Davis economist Dave Rapson.

That's partly because the term encompasses many existing jobs, so it doesn't reflect the job creation goal that politicians are after. "The green job classification hasn't been particularly useful because the work is distributed among so many traditional industries," said Betony Jones, an adviser to government agencies and nonprofits on labor issues who used to work at the University of California, Berkeley Labor Center, which has done some of the most detailed thinking on the amorphous sector. "Where do you draw the line? Do you count recycling jobs but not garbage pickup jobs, and it's the same person?"

Some private groups have been the keepers of the green jobs flame. Over the 6-year period from 2013 to 2018, "advanced clean energy," including energy storage, hydropower, solar, nuclear, ethanol, alternatively fueled vehicles and building efficiency, added 130,350 jobs, according to figures compiled by a Steyer-funded think tank, Advanced Energy Economy. That's about 6.4 percent of California's total non-farm job growth of just over 2 million jobs.

Warren's plan to create 1.2 million jobs over 10 years would add an average of 120,000 jobs per year, or about 5 percent of the U.S.'s annual job growth from 2013-2018. It would also lift GDP by 0.1 percent per year above a baseline assumption of 2.04 percent annual growth, according to an [analysis](#) of the plan the Warren campaign commissioned from Moody's. Steyer's plan to create 1 million jobs would add 100,000 jobs per year. While that's comparable to California's results, it's not exactly the economic "transformation" that Steyer [touts](#).

"A million additional jobs over 10 years, that's not a very large number," said Rob Williams, an

environmental economist at the University of Maryland and a university fellow with the think tank Resources For the Future who published a [working paper](#) earlier this month, which found job creation estimates are not a good rationale for making environmental policy decisions. "The natural amount of jobs created and destroyed every year are just enormously larger than that."

Larger estimates, like Inslee's and Sanders', likely don't reflect net job losses and gains from such labor market shifts, but focus just on the gains.

"In many cases, people are just trying to come up with the biggest number they can come up with," said Williams. "In many cases, what our modeling suggests is these are causing job shifts rather than net job creation. You create clean energy jobs, and you lose jobs in older industries."

Warren's plan, at least, has accounted for that. It assumes the oil and gas industry will lose 160,000 jobs over 10 years, according to Moody's chief economist Mark Zandi.

Sanders' 20 million figure doesn't include losses, according to the University of Vermont ecological economist who did the analysis, Jon Erickson. But he pointed out that Sanders' plan would help workers affected by ongoing declines.

"The economy is hemorrhaging jobs in the coal sector," he said, citing a nationwide decline in coal mining employment over the past 40 years from 250,000 jobs to 50,000 today. "Kentucky today has fewer coal jobs than it did when Trump took office. It's just heading that way, and no amount of wishful thinking is going to turn things around."

His analysis estimates 1.5 million jobs would be created in the wind industry and 3 million in home energy efficiency and weatherization.

"Certainly many of those jobs, you can be thinking of them as transition jobs that would replace losses that are already happening in other industries," Erickson said. "Rather than just let this naturally happen by market forces, the Green New Deal actually helps pay for the economic transition from a fossil fueled economy to a renewable energy fueled economy."

Overall, though, economists don't subscribe to theories of massive job creation. "The sort of standard economist take on all of this is pretty skeptical," said

James Bushnell, another UC Davis economist. "Unless you're in a recession, creating jobs in one sector usually comes at the expense of reduced jobs in another sector." Indeed, California's oil and gas sector shrank by about 6,000 jobs from 2013-18, going from 21,000 to 15,000 jobs, according to state data.

At the least, California's forays into clean energy haven't dampened its juggernaut economy, which rebounded from the recession significantly faster than the national average. "What we know is California's economy has done very well, and we've invested a lot in clean energy," Bushnell said. "I don't know if we're at the point where we can point to causality there. I conclude from that that our investment in clean energy has not hurt the economy. I don't necessarily take it in the direction that it's stimulated growth."

One example that serves as an illustration of California's experience is an energy efficiency program that was put on the 2012 state ballot by none other than Steyer. While he is an outlier among presidential candidates in never having held public office, his decade of experience as the biggest self-appointed promoter of California's energy policies is instructive.

"I think Steyer's probably the only one who knows what he's talking about who has experience with it," said Tom Dalzell, business manager for the International Brotherhood of Electrical Workers Local 1245, the main union representing employees of the state's largest utility, Pacific Gas & Electric.

Steyer, who entered the presidential race in July but has already reached half of the polling levels required to qualify for the fall debates, cut his political teeth in California's clean energy world. He rose to prominence by defending the state's climate policies against a jobs argument at the peak of the recession, bankrolling the campaign against an oil company-sponsored ballot initiative in 2010 that would have suspended the state's greenhouse gas target until the unemployment rate — then at 12 percent — fell below 5.5 percent.

Coming off of that victory, he sponsored a 2012 initiative, Proposition 39, that closed a corporate tax loophole and devoted half of the proceeds to energy efficiency retrofits in schools. The Clean Energy Job Creation Fund, which handed out \$1.5 billion through



last year, provides a real-world comparison to national hypotheticals.

While Steyer [argued](#) at the time that it would create up to 40,000 jobs, the program has resulted in just 8,700 direct jobs, and 19,800 jobs in total including indirect jobs and increased economic activity, according to an [analysis](#) by the UC, Berkeley Labor Center.

Steyer's campaign said that the Prop. 39 job count reflected the fact that only half of the new spending went to schools. The other half went to the state's general fund, "where it goes to other state programs that create additional jobs," spokesperson Ben Gerdes said in an email. As for Steyer's current Climate Corps plan, it's only one part of his broader jobs plan, which will "create a regenerative economy for all Americans" through additional spending on infrastructure and clean energy standards, Gerdes said.

Prop. 39 also created fewer jobs than originally expected because the initiative ended up spending a larger share of funding on schools than envisioned. Efficiency retrofits at schools inherently produce fewer jobs than large, new construction projects, according to one of the key architects of the measure, which was written to give the legislature control over the purse strings.

"The key thing about jobs analysis is you cannot do them without knowing where the money's directed," said Kate Gordon, who served as head of energy and climate for the Steyer-founded think tank Center for the Next Generation and is now California Gov. Gavin Newsom's senior climate adviser, as well as director of the state's planning and research agency. "There was a faction of people who wanted it to be used for commercial real estate and new buildings and upgrades. Those projects create a lot of jobs."

Gordon also previously served as co-director of the Apollo Alliance, the group of environmentalists and labor unions that came up with a plan to spend \$500 billion to create 5 million green jobs. That jobs number made it into Obama's 2008 presidential platform, but didn't fully materialize — despite the 2009 stimulus package -- because it also included a national clean energy standard and a national carbon price, neither of which came to pass, Gordon pointed out.

California has both of those policies. And the biggest single clean energy job engine for the state has indeed been its renewable energy requirements for utilities, which UC Berkeley researchers have [credited](#) with creating 52,000 "job-years" from 2003-2014. That's about 4,300 jobs per year on average, but is more heavily weighted toward the later years, when installations accelerated to about 10,000 jobs per year.

There's been no recent analysis of the number of jobs created from California's cap-and-trade program for greenhouse gases, which has so far generated about \$10 billion through the sale of emissions permits. But a quarter of the revenue has gone to the state's high-speed rail system, which last year [trumpeted](#) the creation of 2,000 construction jobs to date. A 2018 [study](#) estimated that the first four years of cap-and-trade proceeds — \$2.2 billion — had created 19,700 jobs and an additional 55,900 jobs indirectly.

While the numbers aren't huge, the jobs are meaningful to the people who have them. "The Green New Deal says a bunch of things to a bunch of people and it means something different to everybody, but it was pretty strong about creating new work for union workers," Jones said. "And California has a pretty good track record on that."

California's green-collar jobs council has since morphed into state training programs, which received \$12 million in funding from Prop. 39 to train disadvantaged workers, including women, foster youth and formerly incarcerated people. The programs placed 1,721 people into jobs, out of 2,609 people trained. They're now getting funding from the cap-and-trade auctions, as well as the gas tax increase approved by lawmakers in 2017.

"We're going back to the old days of New Deal, big public investments and putting language in those investments," said Tim Rainey, the executive director of the Workforce Development Board, which oversees the training programs.

The trainees are placed as apprentices in jobs being done by union members, including high-speed rail. A particular beneficiary is the Building and Construction Trades Council, which has been one of the most stalwart defenders of oil industry jobs.

The lesson California has learned is not to focus on big-picture numbers. "To the extent it's possible, it's

really important to step away from the specific job number," Gordon said. "This is going to take a rethinking of the way we build infrastructure, buildings, transportation networks, grids, the way we do capital stock turnover of existing companies, infrastructure, everything."

But jobs are still a potent argument in the state legislature, where environmentalists are working to convince unions to stop lobbying against climate policies in favor of continued reliance on fossil fuels. Unions are a swing vote: Sometimes they side with environmentalists, as in their opposition to a bill this session that would have let utilities count existing large-scale hydropower dams towards their renewable electricity requirements — with the attendant effect of reducing the need for new construction projects.

Other times, union workers ally with oil and gas companies, as they [did](#) to torpedo a bill this year that would have curbed oil production and jobs by establishing a 2,500-foot buffer zone between new oil and gas wells and homes, schools, hospitals and playgrounds.

Labor unions have also opposed a years-long effort by renewable energy companies and some environmental groups to coordinate California's electricity grid more closely with surrounding states, because it would enable renewable energy projects to move to right-to-work states. But IBEW 1245 agreed last year to shut down the state's last nuclear plant, Diablo Canyon, by 2025, and the union points to the labor agreements it secured as a potential example for how to transition away from fossil fuels. It's now working with other unions representing oil and gas workers to figure out a "just transition" for them.

On the national level, candidates are also envisioning "just transitions." Sanders' plan would create "millions of good-paying, unionized jobs" in steel and auto manufacturing, construction, energy efficiency retrofitting, coding and server farms and renewable power plants. It would also guarantee fossil fuel workers' wages for up to five years and give them housing assistance, health care, pension support and either job placement or early retirement support.

But on the ground in California, Dalzell isn't optimistic about reaching a compromise with his fellow workers.

"Their on-the-ground reality is different than ours, and so they might have an approach some would consider to be 180 degrees out from ours," he said. "And then steelworkers who represent the refineries, they're very aggressive fighting anything about transportation efficiency, electrification of cars, and on other issues there are tensions."

Meanwhile, the jobs estimates will continue.

"Economists tend to be pretty skeptical that these effects are actually important, but they're clearly important for the politics, so there's this gap between the importance in the political world and the importance economists have paid to it," Williams said.