

California Green Jobs

An Update to a Review of Current Estimates

In February 2015, the Center completed a review of the many competing estimates of green jobs creation in California, entitled [California Green Jobs: A Review of Current Estimates](#). As stated in that review, the policy interest in green jobs is not new to California. For at least 4 decades, the growing body of regulation in our state continues to be justified in part for its potential to spark technology innovations and entrepreneurship that in turn lead to creation of new industries to offset in whole or in part the cost of those rules on both consumers and businesses. The concept generally behind this focus is that through broader adoption of California rules, economies of scale eventually will be achieved and thereby lower overall costs for all. This policy concept runs through California's current climate change and energy policies just as it did earlier in the 1970s when the state first attempted to regulate its way to a broader reliance on alternative energies.

The following is a brief update of current estimates and claims of green jobs creation in the state.

Claim: California has created more than 500,000 green jobs.

Green job proponents have used the “more than 500,000 jobs created” statistic since at least 2011, when it was used in a re-launch press release for Californians for Clean Energy and Jobs, co-chaired by Tom Steyer and George Schultz.¹ The validity of this estimate is best measured by the fact that this number has not changed in 5 years.

As detailed in the February 2015 review, not all of the 500,000 green jobs claimed by proponents have been created as a result of the state’s current policies and regulations. Estimates using this figure along with most other alternative estimates include a large component of jobs reclassified as “green,” including sanitation workers, government regulators and planners, parks employees, long-time utility workers including those within nuclear and other technologies ineligible under the state’s climate change programs, and other occupations that have existed within the state for more than half a century or longer.

¹ <http://ellabakercenter.org/in-the-news/green-collar-jobs-and-the-environment/“californians-for-clean-energy-and-jobs”>

Claim: Advanced, clean energy jobs employed 411,655 people in California in 2013, with the majority of those jobs in energy efficiency. In 2015, advanced, clean energy jobs increased to 507,703 people.

These numbers are contained in the updated green jobs estimates² recently released by Advanced Energy Economy Institute (AEE), an organization founded in 2011 by Tom Steyer.

The AEE reports are only one of several alternative estimates of California green jobs, and have tended to produce estimate significantly higher than others:

- Next 10 previously issued annual estimates of Clean Economy jobs—including Advanced Energy—using a detailed accounting method developed first by Brookings Institution. The last estimate, which counted only direct jobs, identified about 180,000 jobs in 2014, or only 41% of the comparable figure issued by AEE that year. The most current report by Next 10, however, drops the green job estimate.
- Both US Bureau of Labor Statistics and the state Employment Development Department previously issued estimates of green jobs for a short period prior to 2012. These numbers were developed based on a combination of detailed accounting from establishment records and supplemented by surveys. The estimates are roughly 2/3 of the comparable figures subsequently issued by AEE, and include both private jobs along with substantial numbers of government jobs for traditional occupations such as inspectors and regulators, wardens, sanitation workers, and other environmental agency personnel.

AEE's numbers unlike the other estimates are based solely on surveys. As reports have been issued in succeeding years, they have contained progressively less information on the methodology used and details on their job numbers. The Center's February 2015 review of the earlier reports where more of this information was available identified a number of issues with the AEE estimates:

- The reports are unclear on whether the AEE numbers cover only private jobs, or both private and government jobs as the other estimate sources do. If these numbers purport to cover only the private sector, their estimates would be even further out of line with the other sources.
- AEE's estimates for the green job subsector, Advanced Electricity Generation, covers all generation technologies, including some such as nuclear which are not eligible under AB 32.
- Individual components of the AEE estimates are considerably higher than those from other sources. For example, AEE's Advanced Electricity Generation subsector estimate for 2015 is

² <http://info.aee.net/ca-jobs-report-14>

142,704 jobs, of which 78% are shown as employed in Solar. By comparison, EDD data shows that total jobs in Electric Power Generation, Transportation & Distribution in 2015 for all technologies was only 18,900, of which Solar Electric Power Generation was only about 940. Manufacturing of Turbine and Power Transmission Equipment and Electrical Equipment Manufacturing for all technologies combined added only another 13,700. EDD's occupational data shows only another 2,670 jobs for Solar Photovoltaic Installers. Generously combining these results in a total of 35,300, or only one-quarter of the AEE estimate. The AEE report gives no data on which industries provide the jobs supporting the much larger estimate.

- The earlier AEE reports indicate that the AEE estimates—unlike the Next 10, Brookings, BLS, and EDD estimates—cover both direct and indirect jobs, including “supporting services such as consulting, finance, tax, and legal services related to advanced energy” and “producing, manufacturing, distributing, selling, or implementing components, goods or services related to alternative fuels and vehicles.”³ However, the reports do not indicate the extent to which their estimates have been inflated by including these indirect jobs—a typical economic multiplier would place their direct job estimates closer to the lower estimates previously produced by Next 10.
- More importantly, these indirect jobs would have been created regardless if instead of redirecting public, business, and consumer spending to “Advanced Energy” businesses, the resources behind the government subsidies, higher energy costs, and spending for regulatory compliance had instead been available for investment and consumption for other goods and services. Given the higher cost of most of the technologies involved, the indirect jobs created likely would be greater.

A broader issue with the AEE reports is that they portray their job estimates as demonstration of the contention that California’s regulations are not causing harm to the economy. In fact, the job growth they are showing for these businesses is more a reflection of the accelerating growth of regulations that are causing businesses and consumers to shift their spending on regulatory compliance and purchase of these goods and services.

- These green job estimates show only one half of the jobs picture. While consumers and businesses would still likely purchase some green goods and services in the absence of the growing body of regulatory directives, a large part of the AEE estimates are driven by regulatory compliance which requires the purchase of these goods and services, often at a price premium over traditional alternatives. The green job estimates do not show the associated job losses for other businesses in the state.

³ AEE Institute, [California Advanced Energy Employment Survey](#), December 2014, p. 15

- Many of the identified jobs are heavily dependent on continued subsidies in the form of higher prices (e.g., higher utility rates), direct government payments to the businesses or their customers, or regulations that require purchase of these green goods and services. A survey by Solar Foundation⁴ found that had the 30% federal investment tax credit expired at the end of 2016, “62% of installation firms and 60% of project developers expect[ed] to shed workers.” After reporting only negligible revenue from the sale of ZEV credits in the second quarter (vs. \$57 million in the first quarter), Tesla founder Elon Musk recently criticized⁵ the Air Resources Board for being “incredibly weak in its application of ZEV credits,” and called for stricter policies that essentially would require consumers to pay the higher prices needed to sustain this revenue source.

The reliance of many green jobs in the AEE estimates on continued flow of these direct and regulatory subsidies increases risks to the California economy. While subsidized green jobs like all jobs remain subject to economic cycles, the subsidized jobs carry the added risk of failing when government shortfalls occur, including budget shortfalls such as those experienced during the recent economic downturn or program shortfalls due to revenue disruption as has occurred with the past two cap and trade auctions.

Claim: By 2030, climate and clean energy policies are expected to generate an additional 350,000 to 430,000 jobs in renewable energy generation alone.

A number of green job claims have incorporated these statistics which were recently developed in a study put out by the Labor Center at UC Berkeley, Job Impacts of California’s Existing and Proposed Renewables Portfolio Standard.⁶ These numbers also usually include the report’s estimates that to date, the Renewable Portfolio Standard has already created 52,000 direct and 130,000 direct and indirect jobs during the period 2003-2014.

As indicated in the study and the press release, these are not permanent jobs, but are estimates of temporary construction jobs. To put this into perspective, these estimates translate into the equivalent of only 2,700 jobs a year during the period 2003 – 2014. The higher projections under a 50% renewable portfolio standard by 2030 translates into the equivalent of only 22,000 – 27,000 construction jobs a year, or only about 3% of total Construction jobs in 2015.

⁴ The Solar Foundation, [National Solar Jobs Census 2014](#), p. 51.

⁵ <http://www.autonews.com/article/20160804/OEM11/160809887/musk-criticizes-california-board-over-emission-credits-standards>

⁶ <http://laborcenter.berkeley.edu/job-impacts-ca-rps/>

Like all other green jobs reports, the UC study also does not include the offsetting job losses as investment resources are spent on regulatory compliance rather than other job expansion opportunities, and as consumers and businesses shift spending as a result of higher energy costs under the proposed regulations.

Claim: A Next10 study estimated nearly a million more jobs and \$388 billion will be added to the state's economy by 2050 through extending climate and clean energy programs to meet 2030 goals.

These projections are contained in the Next10 report, California Climate Policy to 2015.⁷ As with many recent studies like this done to support the case for more regulation, this paper projects economic growth under different regulatory scenarios. It does not compare what other growth paths are possible with fewer regulatory compliance costs and lower energy prices.

More importantly, the Next10 report along with similar economic projections prepared by Lawrence Berkeley National Lab and the Energy Commission are all based on a continuation of California's current subpar GDP and jobs growth rates. In fact, these studies show that continued real GDP growth rates of about 2% or below are essential to attaining the current and proposed climate change goals—rates closer to the 4% average the state experienced 1987-2000 and the more than 5% it experienced in the late 1970s would cause the goals to be missed from expanded economic activity alone.

The job growth projections contained in the Next10 report translate into an annual growth rate of only 0.8% to 1.3% annually. In contrast, nonfarm wage and salary jobs in California have been growing at an annual growth rate of 2.1% since 2012, and have expanded at faster rates in prior decades.

This dependence on lower economic growth to achieve the state's emission goals is best illustrated by the fact that to date, the largest emissions reductions to meet the state's existing AB 32 goals were not achieved from policies adopted by the state agencies, but were the result of the recent recession. As estimated by the Air Resources Board,⁸ 30% of all emission reductions previously projected as necessary to the meet the current 2020 goal were the result of the "economic downturn" that began in 2008.

The slower job growth rates projected in the Next10 and comparable reports, however, have potential consequences to the state and its efforts to broaden income growth through better jobs. These include: fewer job opportunities to match continued population growth, diminished opportunities to

⁷ <http://next10.org/sites/next10.org/files/FINAL%20Climate%20Pathways%202015.pdf>

⁸ CARB, [Status of Scoping Plan Recommended Measures](#), August 2011

regain the middle class wage jobs lost in the recent recession and continuing through the ongoing recovery period, continued weakness in public revenues required to support budget priorities, and weakened income growth needed to adjust to the higher energy, housing, and transportation costs associated with these policies.

Claim: California's clean energy and climate programs are saving money.

This more generalized claim is based on two presumptions: (1) that a transition away from petroleum-based fuels is preferable given the recent price volatility and (2) that the spending now being required for alternative energies and energy efficiency upgrades will pay off in the long run through lower energy bills.

The fuels claim is based heavily on the price volatility recently experienced as a result of refinery accidents and the lengthy permit decision process that delayed resumption of full production in the state. The price spread for California regular gasoline compared to the US average grew as high as \$1.03 a gallon, and has continued near the \$0.60 level for the past six months. This period of price volatility is not new, however, and has been a repeated feature of the state's fuel markets ever since the Air Resources Board began issuing fuel regulations that isolated the California market beginning in the early 1990s.

In response to these prior periods, the California Attorney General has conducted at least two reviews⁹ of the conditions that have led to the state's highly volatile prices for gasoline and diesel. These reports found that while part of the increased cost is due to California's higher fuel taxes and higher cost of production due to regulatory requirements (including, now, cap and trade costs), they also conclude that California's past fuel regulations have turned the state into a "fuel island" with few ready, alternative supply sources from other states and nations. These same regulations led to further consolidation in production, as refineries were required to make upgrades to their facilities to comply with the regulations and as many independent refineries were forced to leave the market due to the cost of these upgrades. The result is that prices have become more volatile, and react quickly to any supply problems within the regulatory constrained California market.

Existing Air Resources Board fuel regulations have already created the conditions under which price volatility results from even minor supply disruptions within the state's constrained supply system. Additional regulations—including those designed to reduce petroleum fuel use and therefore available in-state supply sources—will likely lead to even more constraints, continuing or even exacerbating the market volatility the state has experienced since the first fuel regulations were imposed in the early

⁹ <https://oag.ca.gov/antitrust/publications/gasstudy>

1990s. Increasing Air Resources Board regulation has been associated with increasing price volatility. To expect even more constraints will somehow produce savings for most Californians ignores the conditions under which they've lived for the past quarter century.

Concerning the potential savings from broader energy spending, a number of organizations have put out analysis showing a positive return, including a recent piece by Consumers Union.¹⁰ These analyses, however, are based on current engineering study estimates of the potential costs of various regulations already imposed or being considered by the state agencies. These numbers have to be considered in light of the following issues:

- Most savings are long-term savings that require consumers and businesses to make larger up front purchases, e.g., a higher-priced electric vehicle, solar panels, energy conservation improvements to homes. The savings then are realized over 10-20 years, and are dependent on accurate projections of energy prices including fuel costs, electricity rates, and overall energy supplies. In recent years, these projections completely missed the turnaround in energy prices caused by new production technologies for traditional sources such as oil and natural gas. More critically, these projections in essence are based on requiring consumers to buy 10-20 years of energy up front under the expectation they will save in future years through lower monthly bills. These added price premiums—as demonstrated by studies of who actually buys these goods such as solar panels and ZEVs—may be affordable for higher income households, but will be more of a burden for lower and middle class income households even if current subsidy levels are maintained in light of future budget priorities and potential failure of existing funding sources such as the cap and trade auctions.
- The cost savings numbers are based on engineering estimates. The agencies have done no work to evaluate the actual effectiveness or the cost effectiveness of measures already imposed by regulation or measure their actual costs and benefits in the field, and are unable to do so comprehensively since most of the measures already required under AB 32 have yet to be fully implemented. One of the few studies to date was completed last year by researchers at UC Berkeley,¹¹ who found that the costs of energy efficiency upgrades in the aggregate did not provide any savings to the 30,000 households they studied, but instead cost double the actual energy savings.

¹⁰ http://consumersunion.org/news/report-california-clean_transportation-policies-provide-net-savings-for-consumers/

¹¹ <http://e2e.haas.berkeley.edu/pdf/workingpapers/WP020.pdf#page=1>