

Preliminary California Estimates

The primary purpose of this project is to produce a more current and transparent estimate of green jobs in the California economy. This section summarizes the steps used to create the preliminary estimate. This estimate will then be used as the base for the project's next steps: (1) validation and additional calibration of the estimate through an employer survey and (2) a more complete assessment of the jobs stemming from the underlying state policies through a net impact comparison of green jobs created by those policies vs. reduction in other jobs as a result of the costs of those policies.

General Provisions

In general, the procedures used in this report draw on the previous analysis of the various estimates published on green/clean energy jobs creation in California. Similar to many of the estimates discussed in the prior sections, our initial estimate of California green jobs begins with the prior BLS work. This is one of the few works with sufficient documentation to construct comparable numbers, and provides the detail required to delineate between potentially direct and likely indirect jobs as contained in the aggregated numbers found in many of the other reports. Where the available public data is incomplete including due to nondisclosure requirements in the data series, other sources are applied including the detailed breakdowns in CARB (Environmental Business International, 2011), Commerce (2010), Next 10 (various dates), and Brookings (Muro, 2011) along with the more generalized distributions in the other reports.

Base Data

The base data is developed from the Quarterly Census of Employment & Wages (QCEW) data, which is broken down by detailed NAICS industry and available from BLS and EDD by the number of wage and salary jobs, number of establishments, and various other metrics. Estimates in this report are derived from the 2016 annual average data, and will be updated to 2017 after the fourth quarter data is released.

In some cases, the QCEW data is subject to nondisclosure due to the agency data restriction policies. These are handled by using the next highest available NAICS level where data is reported, or estimating from the establishment numbers based on recent employment factors from prior quarters or using comparable national rates.

The QCEW job numbers—as is the case with all the green job estimates considered in this report—are not full time equivalents. Instead, they count the number of jobs by month and average them over the year regardless of whether they are part time, full time, temporary, or permanent. Similarly, the BLS green jobs factors used in the estimate below were not derived from a survey of jobs, but are instead based on the estimated distribution of survey respondent sales between green goods and services and non-green applied to total employment. This approach differs from that used in many of the other estimates covered above, which counted an employee as green/clean energy if they spent as little as 25% of their time on the covered activities. Consequently, there will be some differences arising out the fact that the nature of the “jobs” being measured differences widely across the different sources. This difficulty in translating job numbers into full time equivalents,

however, is a common feature of both the reports reviewed in this document as well as the standard publicly reported jobs data series.

The important difference to note, however, is that the jobs contained in the estimate below are from the same base as is reported by the agencies in the quarterly data and is comparable to those as counted in the original BLS green jobs estimates as well as those by EDD. This factor allows for more consistent comparisons to the overall trends in the state economy, a feature missing in some of the other estimates reviewed here.

Allocation Factors

In most instances, the green job components by industry are developed from the green job rates developed in the BLS estimates, and updated by applying the changing industry mix and industry employment levels shown in the 2016 QCEW data. The BLS estimates provide the most detail in the national numbers at up to 6-digit NAICS. The California results are presented only at the 2-digit level. Consequently, where these are applied, the national rates are used but adjusted as required using the aggregated California indications.

The detailed BLS green jobs rates are available for two years, both 2011 and as revised for 2010. Generally the 2011 rate is applied when the two years are close, and selected based on what distribution information is available in the other years in cases where the two years differ more substantially (e.g., distributions in the other estimate reports, indications of whether the subject industry was growing or slowing, or shifting over more to green offerings).

As discussed in the specifics below, other sources are used in some cases where more current or additional data is available. These include the other reports along with other publicly available data sources.

In some cases, the QCEW data is subject to nondisclosure due to the agency data restriction policies. These are handled by using the next highest available NAICS level where data is reported, or are estimated from the establishment numbers based on recent employment factors from prior quarters or using comparable national rates.

Direct vs. Indirect Jobs

The estimates attempt to focus on direct jobs and delineate between these and the significant level of indirect jobs incorporated into many of the prior estimates, including the BLS numbers. This difference is generally clear for the goods producing NAICS, but not in all cases. For example, the BLS estimates include jobs in a number of construction industries due to factors such as “installation of LEED-eligible drywall” or “use of LEED-eligible paints meeting VOC limits.” These jobs—which would be required for the construction of any building—are simply defined as green due to the materials used being classified as green. On the other hand, BLS includes some site preparation jobs based on the use of “LEED-eligible demolition contractors.” In this case, the jobs are in an establishment providing services specifically certified as having a distinct production process resulting in a “green” outcome.

Services allocation is less clear. BLS estimates include jobs under general automotive repair due to “repair of parts for hybrid cars.” Again, the allocation is based on the “green” nature of the

materials involved and bypasses the fact that owning a car generally requires availability of jobs capable of repairing it at some point. On the other hand, “repair of emissions control systems” along with smog check businesses is directly related to jobs that were created solely as a result of the need for producers or consumers to comply with specific regulations. As another example, jobs are classified as “green” because they involve the “repair of Energy Star certified telephones.” The basic jobs, however, were created because people buy telephones. A “green” telephone designation—unless the components required to make it “green” resulted in the phones breaking substantially less or more frequently—has no discernible effect on the overall level of those jobs. In other examples, “environmental/eco-tourism” tour operators along with “environmental testing services” and “environmental legal services” are jobs that exist largely as a result of changing consumer preferences or state policies, but television broadcasting and radio stations would still likely find content to fill their airtime without “environmental content” specific to their media.

The focus on direct jobs reflects the policy use of green/clean energy job estimates as a purported measure of the resiliency of the California economy in the face of growing regulation. The California economy in recent years has undergone significant structural change, first as a result of the recession and subsequently as a result of increased state regulation of the economy through environmental regulations, notably the climate change program. The direct jobs created in response to this second factor are a measure of the related structural shifts. Measuring the resulting “resiliency” can then be done by assessing the degree the structural shifts rely on continued subsidy payments and policies, and whether they support indirect jobs within the economy to the same degree as jobs within traditional industries that are now negatively affected by those policies.

This delineation is not to say the indirect jobs are unimportant. They still provide income and employment to the population and they contribute to the overall health of the state economy. However, such indirect jobs would still result at some level with or without the current state policies directing them to their current levels. California employers, governments, and households would still be using electricity and other forms of energy but likely produced in a different form. Payments that now go to higher energy rates would still remain in the economy as consumption on other goods, investment, or savings. A more appropriate measure of resiliency is the overall net effect, an element missing from most of the previous estimates considered in this document.

Government Jobs

Government jobs are included in the estimate below primarily to the extent they represent enterprise activities. For example, publicly owned utilities operate hydroelectric and some alternative energy facilities as do a number of water agencies. A number of other enterprise activities, including public transit, water supply, sewerage, solid waste, and parks, are included in the BLS estimates. While they operate today and in some cases have expanded as a result of state and federal “green” policies and regulations, they also constitute historically provided public services and as such form a prime component of the jobs that have reclassified as such in the green jobs studies. These are addressed in the estimates developed for this report but are handled as discussed below. Additional government jobs related to public administration—primarily those involved in the development and administration of the regulations and in the management of government parks and other resources holdings—are also included, but covered as well under the reclassified grouping.

Reclassified Jobs

As indicated, a number of jobs incorporated into the green/clean energy estimates come from long-standing industries that have existed prior to, and in some cases in spite of, current “green” policies. Most of the estimates incorporate jobs for technologies specifically excluded from components of the climate change policies, including conventional hydroelectric, pumped storage hydroelectric, nuclear, and some natural gas facilities. In fact, some of these jobs are being eliminated as the combined effect of the broader set of state policies are resulting in the closure of these facilities as opposed to higher emissions sources. As discussed above, a number of government enterprise activities and traditional regulatory functions similarly predate the current regulatory frameworks.

For the purposes of making this report’s estimates inclusionary, these jobs are incorporated largely as they are treated in the BLS accounting. However, where delineation is possible, the results indicate the portions representing reclassification rather than those resulting from the state’s current regulatory framework.

Estimates by Industry

The following summaries adjustments made to the BLS factors by industry.

Agriculture, Forestry, Fishing & Hunting

Most estimates incorporate the following components:

- Organic farming is generally treated as a green good that has evolved from consumer preferences rather than mandated through regulation. Estimates for crop and animal production were developed from sales and acreage estimates for California (USDA, 2017), applied to total California production numbers from USDA for 2016. These shares were then applied to the related job numbers for each component of the industry. While some studies (Finley, 2017) indicate that organic operations have somewhat higher labor needs than traditional operations at about 2-12% higher, the numbers are also affected from the premium built into the organic sales numbers and differing yields associated with the acreage numbers. Consequently, no adjustments were made for this factor. Related support activities are from the BLS factors.
- The BLS factors also include a component related to grain use for biofuel. However, compared to operations in other states, California biofuel facilities are generally less likely to use processes that shift food crops to industrial uses, and instead rely on feedstocks such as wastes and imported feed grain that is processed for fuel and then sent on to feeding operations. No component is included for this purpose but is instead incorporated in the other industry estimates.
- Forestry and logging includes sustainable certified timber and wood chips and waste for biomass and other purposes. Derived from the BLS factors as are the related support activities.

Utilities

Includes totals for hydroelectric, nuclear, solar, wind, geothermal, and biomass power generation. Jobs related to “advanced natural gas generation” are estimated using the factors in the most recent AEE report. All other components are from the BLS factors. Jobs related to hydroelectric, nuclear, and advanced natural gas are labeled as reclassified due to two factors: (1) the primarily stem from technologies in use prior to the state’s current regulatory regime, and (2) except for small hydro, all are precluded from the Renewable Portfolio Standard component of the climate change program. Energy Commission data shows small hydro as measured by capacity represents 12% of total hydroelectric capacity in the state. However, these projects tend to be highly automated compared to the larger projects, and capacity has not changed appreciably since 2001, well before the current regulatory structure.

Note that the nuclear jobs related to San Onofre no longer are for the production of a product or service like the other components of this estimate, but instead are now focused on the decommission process.

The government numbers include totals for related power generation along with BLS factors applied to totals for Water Supply and Irrigation Systems and Sewage Treatment Facilities. The last two components are labeled as reclassified.

Construction

Applies BLS factors for those components deemed “green” based on the process or construction specialty used, and does not incorporate components tagged as “green” in the BLS numbers based on the use of “green” materials or components in an otherwise typical construction activity. These additional construction jobs will be covered in the indirect estimates of the subsequent project phase. The reclassified component is primarily from in-house construction jobs related to the government-owned utilities covered above.

Manufacturing

Applies BLS factors in most cases, but with adjustments for vehicle component manufacturing and for Tesla’s facility in Fremont based on industry sources.

Trade

Applies BLS factors in most cases, but with adjustments for recycling operations. The reclassified component consists of Used Merchandise Stores, while recycling components are not included in this designation.

Transportation & Warehousing

Applies BLS factors. The covered (private and government) jobs are primarily with bus, rail, and other transit systems, and are consequently are treated as reclassified.

Information

Applies BLS factors. Reclassified jobs cover media jobs which BLS designates as green for reporting environmental content, for example jobs developing environmental content for otherwise extant radio, television, and newspaper outlets.

Financial Activities

Applies BLS factors. No reclassified industries.

Professional, Scientific & Technical Services

Applies BLS factors. Reclassified jobs cover some of the government components.

Management of Companies & Enterprises

Applies BLS factors. No reclassified industries.

Administrative & Support & Waste Management & Remediation Services

Applies BLS factors. Most of the waste related jobs are designated as reclassified except for a portion of Waste Collection based on the state-wide recycling rate and for materials sorting activities.

Educational & Health Services

Applies BLS factors. No reclassified industries

Leisure & Hospitality

Applies BLS factors. Museums, Parks and Historical Sites jobs are designated as reclassified.

Other Services

Applies BLS factors. Various repair activities are designated as reclassified.

Public Administration

To reflect some of the functions incorporated into the EDD estimates, incorporates jobs related to Administration of Environmental Program and a component of Utility Regulation & Administration based on the relevant portion of the Public Utilities Commission positions. Both entries are designated as reclassified.