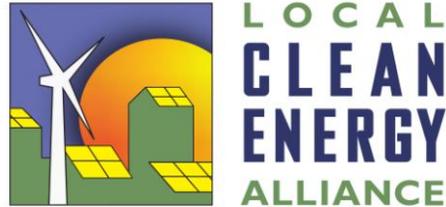


September 28, 2011

Preliminary Jobs Estimate for CleanPowerSF



This document is meant to provide very rough ball-park estimate of the number of jobs created per year in San Francisco from implementing the five-year rollout in the CleanPowerSF 2007 Implementation Plan.

In-city Build-out Targets

The 2007 Implementation Plan calls for building a minimum of 210 MW of in-city resources phased in within the first three years, and with a target of 51% renewables within the first five years. The breakdown for the first three years is as follows:

- 31 MW solar PV
- 72 MW various local distributed generation
- 107 MW local efficiency

The five-year 51% target represents, approximately, an extension of the three-year local build-out rate for another couple of years, so the estimates below actually apply to a five-year time frame.

While solar PV tends to be more job intensive, especially for small installations, than wind or combined heat and power, the 72 MW of “various local” technologies will nevertheless be assumed to be solar PV for the purpose of these rough estimates. Thus, the CleanPowerSF three-year targets used herein are 103 MW installed solar PV generating capacity and 107 MW installed energy efficiency reduction capacity.

Jobs Estimates

A number of studies have been conducted on the jobs-generating potential of different renewable energy technologies. These studies use different techniques and different data in making estimates of the number of job-years created in building renewable energy resources. Most studies estimate direct installation jobs as well as indirect jobs (employment by suppliers) and/or induced jobs (employment due to increased local spending). The results of these studies (which are cited in the following section) represent a range of estimates.

In using these studies, it was assumed that jobs for manufacturing solar panels and energy efficiency supplies would not generally be located in San Francisco, and were therefore ignored. Also, ongoing jobs in operations and maintenance for solar PV and efficiency are relatively small, and were also ignored.

Considering solar PV and energy efficiency jobs separately:

- For Solar PV:

Direct jobs for integration and installation range from: 13 job-years/MW to 26 job-years/MW.
Indirect and induced jobs multipliers range from: 0.7 to 0.9

Total jobs (combining the direct, indirect, and induced) range from 22 job-years/MW to 49 job-years/MW

- For Energy Efficiency:

Direct jobs for energy efficiency range from: 6.6 job-years/MW to 11 job-years/MW
The induced jobs multiplier is reported to be: 9.0

Total jobs (combining the direct, indirect, and induced) range from 66 job-years/MW to 110 job-years/MW

Based on these ranges, the average number of jobs per year for the three-year CleanPowerSF buildout targets are estimated as follows:

CleanPowerSF Jobs per year to build 210 MW in-city resources within first three years

	Direct Jobs (range: midpoint)	Direct + Indirect + Induced Jobs (range: midpoint)
Solar PV (103 MW)	446 – 893: 670	755 – 1682: 1219
Energy Efficiency (107 MW)	235 – 392: 313	2354 – 3923: 3138
CleanPowerSF Total	681 – 1285: 983	3109 – 5605: 4357

Based on the assumptions and ranges above, the CleanPowerSF program is estimated to provide an average of approximately 983 direct jobs each year and 4357 total jobs in San Francisco each year for the first three years of the program, and for an additional two years as well, assuming the 51% renewables target is met.

Sources for Jobs Estimates

Solar PV

1. Source: *Jobs and Economic Development Impact (JEDI) Models*, National Renewable Energy Lab (NREL), 2011:

<http://www.nrel.gov/analysis/jedi>

Direct Jobs (installation; maintenance negligible):

21 job-yrs/MW residential (4kW)

16 job-yrs/MW small commercial (25 kW)

Induced Jobs Multiplier:

0.9 (18 job-yrs/MW) residential

0.9 (14.5 job-yrs/MW) small commercial

2. Source: *Shining Bright; Growing Solar Jobs in Iowa*, Iowa Policy Project, March, 2011:

<http://www.iaenvironment.org/documents/SolarJobsReport.pdf>

Direct Jobs (installation; maintenance negligible): 24 job-yrs/MW

Indirect and Induced Jobs Multiplier: 0.74

3. Source: *Economic Impacts of Extending Federal Solar Tax Credit*, Navigant Consulting, 2008,

<http://www.seia.org/galleries/pdf/Navigant%20Consulting%20Report%209.15.08.pdf>

The study shows: 14.3 for system integration and installation, .3 for annual O&M, 3 for BOS, 11 for manufacturing. No induced jobs are shown.

Direct Jobs (installation and maintenance): <50KW: 14.6 job-yrs/MW* (page page 33)

Indirect Jobs: 3 job-yrs/MW for BOS, not including manufacturing (Multiplier of .2)

Total Jobs: 18/MW (page 27)

Study cited in in: *Bringing Solar Energy to Los Angeles*, Los Angeles Business Council, July 2010)

http://www.labusinesscouncil.org/online_documents/2010/Consolidated-Documents-070810.pdf,

4. Source 4a: *Solar Generation: Solar Electricity for Over 1 Billion People and 2 Million Jobs by 2020* EPIA (European Photovoltaic Industry Assoc.) and Greenpeace, September 2006
<http://www2.epia.org/documents/SG3.pdf>, page 32

Source 4b: Renewable and Appropriate Energy Laboratory (RAEL), UC Berkeley, 2011
Green Jobs Calculator: <http://rael.berkeley.edu/greenjobs>

Direct Jobs (installation and maintenance): 26 job-yrs/MW +1 ongoing jobs/MW

Indirect Jobs multiplier: 0.9

Study cited in: Kammen, *Putting Renewables to Work*, 2006
<http://rael.berkeley.edu/sites/default/files/very-old-site/renewables.jobs.2006.pdf>

5. Source: *Job Creation Studies for Vote Solar* (2004), UC Berkeley, 2004
http://www.votesolar.org/linked-docs/MSR_Job_Creation.pdf

Direct Jobs (installation and maintenance): 13 job-yrs/MW

Indirect Jobs Multiplier: .8 (Regional Input-Output Model, RIMS II)

Energy Efficiency

1. Source: Bell, *Electricity Supply and Price Security in San Diego County*, Appendix 3, 2007
<http://www.jimbell.com/mayor/index.html#Appendix3A>

Direct Jobs: 11 job-yrs/MW reduction

2. Source: Wei, Patadia, and Kammen
Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US?, 2009
http://rael.berkeley.edu/sites/default/files/WeiPatadiaKammen_CleanEnergyJobs_EPolicy2010_0.pdf

Direct jobs: 6.6 job-years/MW reduction

Total jobs (direct, indirect, and induced): 66 job-years/MW reduction

“... We assume that the majority of jobs are induced jobs (90%) and only 10% are direct jobs associated with energy efficiency products or installation, an assumption used by the ACEEE in the past (Geller, 1992). The business-as-usual (BAU) case of energy demand already assumes a certain amount of energy savings and energy efficiency-induced jobs due to existing building codes and appliance standards, industry improvement, and implicit programs (EPRI, 2009), so our energy efficiency net job gains are additional jobs above and beyond this implicit base line level.”

The Local Clean Energy Alliance is the Bay Area's largest clean energy coalition, with 90 affiliated member organizations, including environmental justice, social justice, environmental, business, and community groups. The Alliance sees the need for an integrated state energy policy that includes both energy demand reduction resources and local renewable generation resources. We believe that it is through integrating both these types of resources that communities can achieve their full greenhouse gas reduction and climate adaptation potential while enhancing local economies, providing clean energy jobs, and improving community health.