



Fact Sheet

Jobs in Renewable Energy and Energy Efficiency

June 2011

This factsheet provides the number of U.S. jobs in the energy efficiency and renewable energy industries. These estimates change constantly due to rapid expansion of renewable energy deployment and changing market conditions. *Direct jobs* are jobs associated with the construction and maintenance of energy projects; *indirect jobs* are jobs in industries that provide goods and services to the companies that build and maintain energy projects; *induced jobs* are jobs supported by the economic activity related to energy projects, like an added hotel or deli near a project site. Although indirect and induced jobs are very real, these numbers are largely theoretical (for any industry) because it is difficult to calculate them and different methodologies are used.

This fact sheet relies on estimates from government agencies and industry associations. Not all estimates are calculated the same way or include estimates of all three job categories. The Department of Labor’s Bureau of Labor Statistics is currently conducting surveys on the number of U.S. “green” jobs, which will encompass the energy efficiency and renewable energy industries. Publication of these statistics is scheduled for the spring and summer of 2012. To learn more, visit www.bls.gov/green.

ENERGY EFFICIENCY

Many energy efficiency jobs are within larger industries, like home building and renovation, making them difficult to quantify. In a 2010 study, Lawrence Berkeley National Laboratory (LBNL) estimated energy efficiency jobs in “person-years of employment,” referring to the equivalent of one person working full-time for one year. LBNL estimated that every \$1 million spent on energy efficiency produced 2.5-8.9 person-years of employment, depending on the activity.¹

Activity	Person-Years of Employment (PYE) per \$1 million
Ratepayer-funded Efficiency Activity	6.2
Low Income Weatherization	8.9
Energy Services Companies (ESCOs)	2.5
Insulation	8.9
Federal and State Govt EERE Offices	6.5

Table reprinted from LBNL Report “Energy Efficiency Services Sector: Workforce Size and Expectations for Growth”, September 2010.

Energy efficiency’s net employment impacts go far beyond the definitions above. Jobs also are created from the increased consumer spending that comes with energy savings. For example, a household’s energy dollars that would normally go to pay utilities will be spent elsewhere in the economy. A 2011 study estimated that appliance, equipment, and lighting standards alone generated 340,000 jobs in 2010, based on \$34 billion in energy savings, either created that year or sustained from previous years.²

RENEWABLE ENERGY

Wind: According to the American Wind Energy Association (AWEA), the wind industry and related fields employed 85,000 Americans in 2010.³ However, due to the economic downturn and lack of a long-term energy policy at the federal level, AWEA estimates that the wind industry currently employs closer to 75,000 people.⁴

Solar: The Solar Foundation estimated that the U.S. solar industry employed 93,000 workers in 2010, and expected that number to grow 26 percent by August, 2011.⁵ This marked a nearly 100 percent increase from 2009, when the solar industry employed 50,000 workers, according to estimates.⁶

Hydropower: Navigant Consulting estimated 200,000-300,000 direct jobs currently in the hydropower industry.⁷ This estimate assumes 2-3 full-time equivalents per megawatt (MW) to maintain, operate, and license compliance for the existing 100,000 MW fleet.

Geothermal: The Geothermal Energy Association's latest estimate of the industry was 5,200 direct jobs as of 2010. Indirect and induced jobs were estimated at 13,100 jobs. Geothermal industry employment is expected to increase by 2,805 jobs this year.⁸ In 2008, GEA estimated that direct employment was 4,583 jobs, and induced jobs totaled 11,460.⁹

Biomass: The Biomass Power Association estimates that the biopower industry provides 14,000 jobs in the United States.¹⁰ In 2008, the U.S. biodiesel industry maintained 51,893 jobs.¹¹ Approximately 70,400 Americans are employed directly by the ethanol industry, with an additional 400,677 indirect and induced jobs being produced.¹²

Type of Renewable Energy	U.S. Job Estimates	Relation to Industry
Wind	75,000	Direct/indirect
Solar	93,500	Direct/indirect*
Hydropower	200,000-300,000	Direct
Geothermal	18,300	Direct/indirect
Biomass power	14,000	Unknown
Biodiesel	51,893	Unknown
Ethanol	70,402; 69,564; 260,711	Direct; indirect; induced
Total	853,370-953,370	

** Estimate comes from a direct survey of solar employers, who reported the number of workers who spend 50% or more of their time in solar.*

¹ Goldman, C. et al. 2010. *Energy Efficiency Services Sector: Workforce Size and Expectations for Growth*. Lawrence Berkeley National Laboratory. September, 2010. Slide 19.

² Gold, R. et al. 2011. *Appliance and Equipment Efficiency Standards: A Money Maker and Job Creator*. American Council for an Energy-Efficient Economy. January, 2011. p.1.

³ Hamilton, J. Liming, D. *Careers in Wind Energy*. Bureau of Labor Statistics. November, 2010.

⁴ Email communication. Elizabeth Salerno, AWEA. May 16, 2011.

⁵ The Solar Foundation. 2010. *National Solar Jobs Census 2010: A Review of the U.S. Solar Workforce*. October, 2010.

<http://www.thesolarfoundation.org/sites/thesolarfoundation.org/files/Final%20TSF%20National%20Solar%20Jobs%20Census%202010%20Web%20Version.pdf> (retrieved May 24, 2011).

⁶ Ibid.

⁷ Navigant Consulting. 2009. *Job Creation Opportunities in Hydropower*. September, 2009. http://hydro.org/wp-content/uploads/2010/12/NHA_JobsStudy_FinalReport.pdf (retrieved May 16, 2011).

⁸ Jennejohn, D. 2010 *Green Jobs Through Geothermal Energy*. October, 2010. Geothermal Energy Association. p.6-7.

⁹ Geothermal Energy Association. *Geothermal Basics-Employment*. http://www.geo-energy.org/geo_basics_employment.aspx (retrieved May 23, 2011).

¹⁰ Biomass Power Association. *U.S. Biomass: Growing a Greener Economy*. <http://www.usabiomass.org/pages/links.php> (retrieved May 24, 2011).

¹¹ National Biodiesel Board. 2009. *Biodiesel, Renewable Diesel & Co-Processed Renewable Diesel*.

http://www.biodiesel.org/pdf_files/fuelfactsheets/RenewableDiesel_Co-ProcessedMar09.pdf (retrieved May 23, 2011).

¹² Urbanchuk, J. 2010. *Contribution of the Ethanol Industry to the Economy of the United States*. February 12, 2010.

<http://ethanolrfa.org/page/-/Ethanol%20Economic%20Contribution%202010%20Final%20Revised%20010411.pdf?nocdn=1> (retrieved May 23, 2011) p.7.