



FACT SHEET

Jobs from Renewable Energy & Energy Efficiency

November 8, 2007

National

- According to research by Roger Bezdek for the American Solar Energy Society, the renewable energy (RE) and energy efficiency (EE) industries created a total of 8.5 million jobs in 2006; 450,000 jobs in RE and 8 million jobs in EE throughout the United States.ⁱ
- The Union of Concerned Scientists estimate that a national Renewable Portfolio Standard (RPS) of 20% by 2020 would create 185,000 new jobs from renewable energy development, add \$25.6 billion in income to farmers, ranchers, and rural landowners and save consumers \$10.5 billion in lower electricity and natural gas bills by 2020.ⁱⁱ
- A report from the Renewable and Appropriate Energy Laboratory in Berkeley found that renewable energy creates more jobs per megawatt (MW) of power installed, per unit of energy produced, and per dollar of investment, than the fossil fuel energy-based sector.ⁱⁱⁱ
- The Union of Concerned Scientists estimates that requiring automakers to meet a fleetwide average of 35 miles per gallon by 2018 will create 241,000 additional jobs nationwide by 2020, and increase jobs in the automotive sector alone by 23,900. Such a requirement would also save consumers \$37 billion in 2020 alone and cut national oil use by 1.6 million barrels per day by 2020.^{iv}

States

- A study by the IC2 Institute reports that **Texas** could add 123,000 new high-wage jobs by 2020 to its economy by actively moving toward solar power.^v
- A recent study by the American Council for an Energy-Efficient Economy (ACEEE) reports that by adopting energy efficient strategies **Florida** will save \$28 billion, offset the state's entire future growth in electric demand by 2023, and create more than 14,000 jobs in 2023.^{vi}
- Based on the ACEEE report, **Florida** recently adopted a series of rigorous clean energy policies,

including a dramatic reduction in greenhouse gas emissions, a 20% renewable electricity by 2020 Renewable Portfolio Standard (RPS), and the California motor vehicle emission standards.^{vii}

- According to Environment California, the impact of meeting **California's** previously enacted RPS of 20% by 2017 would create an estimated 119,000 person-years of employment at an average salary of \$40,000. The California RPS has now been pushed forward to 20% by 2010.^{viii}
- Environment California also forecasts that **California's** Million Solar Roof Initiative will create 15,000 new jobs for the Golden state.^{ix}
- The Union of Concerned Scientists concluded that **Washington's** Initiative 937 (I-937), a 15% by 2020 RPS, would create 2.6 times more jobs than fossil fuels, resulting in a net increase of 1,230 jobs by 2025 for the state.^x
- In a report for the American Solar Energy Society (ASES), Roger Bezdek found that **Ohio** created over 500,000 total jobs in Renewable Energy and Energy Efficiency industries in 2006.^{xi}
- A new study by Global Insight Inc. for the Renewable Energy Trust reports that the clean energy sector currently provides over 14,000 jobs in **Massachusetts**, and will soon become the 10th largest sector in the state.^{xii}

International

- According to the European Union Commission on Monitoring and Modeling Initiative on Targets for Renewable Energy (MITRE), net employment growth in the **European Union** is projected to increase to 950,000 under current policies, and up to 1,660,000 under the Advanced Renewable Strategy (ARS) of meeting 22.1% of energy demand with renewable energy by 2010.^{xiii}
- The Danish Wind Energy Association reports that wind energy created over 20,000 jobs in **Denmark**,

supplied 20% of their electricity in 2004 and will supply 25% by 2008.^{xiv}

- According to the ASES-Bezdek report, RE employed over 214,000 people in **Germany** in 2006, 64,000 of whom are employed in the wind industry, according to the German Wind Energy Association.^{xv}
- RenewableEnergyAccess.com reported that **Germany** recently increased its Renewable Energy Sources Act, increasing its renewable energy targets from 20% to 27% by 2020, and to 45% by 2030.^{xvi}
- Erneuerbare Energien, a German Renewable Energies organization, predicted that if **Germany** met its [now outdated] goal of 20% by 2020, 500,000 people would be employed within the RE sector by 2020.^{xvii}
- The European Wind Energy Association reports that **Spain** currently employs about 35,000 people in the wind industry.^{xviii}
- In **Brazil**, the US Agency for International Development (USAID) sponsored a program to train students from the poorest neighborhoods in building renewable energy capacity. Nearly 12-15 million Brazilians live without electricity. The program has been a huge success--over 60% of the graduates from the 8-month long program now have jobs or are attending university full-time, and rural communities are benefiting from the new access to electricity.^{xix}

Wind

- According to the American Wind Energy Association, the United States currently has over 11,000 MW of installed wind energy capacity. Roger Bezdek concludes in his ASES report that in 2006 the wind industry created 16,000 direct jobs and 36,800 total jobs in 2006.^{xx xxi}
- According to a study by the Renewable Energy Policy Project, a national development of 50,000-70,000 MW of wind energy could potentially create 215,000-331,000 full time equivalent job/years of employment.^{xxii}

Biofuels

- The ethanol industry produced 5 billion gallons in 2006, and created 163,034 jobs in all sectors of the economy during 2006 according to a report by the Renewable Fuels Association. Ethanol Across America reported the creation of 5,300 jobs in Minnesota, 5,187 jobs in Iowa and 3,000 jobs in Nebraska.^{xxiii xxiv}
- Assuming biodiesel growth reaches 650 million gallons of annual production by 2015, the National Biodiesel Board estimates an additional 39,102 jobs will be created between 2006-2015.^{xxv}

Geothermal

- The Geothermal Energy Association (GEA) reported 4,583 direct jobs in 2004, with an average salary of \$40,000-50,000.
- The Energy Information Administration (EIA) projected an increase of 2,455 MW in the geothermal industry by 2026, which would create 8,764 direct jobs and 21,910 total jobs by 2026 according to GEA.^{xxvi}

Solar

- Predicted to become a \$15 billion industry by 2020, the solar energy industry employed over 20,000 people in 2001, and is expected to employ 150,000 people in 25 years.^{xxvii}
- The Solar Energy Industries Association (SEIA) has a goal of supplying half of all new U.S. electricity generation from the sun by 2025, creating over 260,000 jobs by 2030.
- SEIA estimates that extending the Investment Tax Credit (ITC) by 8 years will create more than 55,000 new American jobs in the solar industry and over \$45 billion in economic investment by 2015.
- A joint analysis by Greenpeace and European Photovoltaic Industries Association (EPIA) shows that if 205 gigawatts of photovoltaic (PV) systems capacity are in place by 2020, solar energy could provide 2 million jobs worldwide.

Wave & Tidal

- Pat Cooke, Chairman of Able Engineering and head of the FreeFlow 69 project, estimates that a 1,000MW wave and tidal power system could create up to 2,000 manufacturing and installation jobs and 100 permanent jobs.

Coal

- According to data from the National Mining Association (NMA), jobs in the U.S. coal mining industry have been decreasing steadily since 1985 (185,000 jobs in 1985, now down to 80,000 in 2005).^{xxviii}
- FutureGen, a government-sponsored \$1.5 billion 275MW clean-coal, near-zero emission plant, is expected to create 200 permanent jobs and 600-700 jobs during construction according to the Department of Energy.^{xxix}

Coal-to-Liquid

- The Coal-to-Liquid Coalition reports that a typical 10,000 barrel/day CTL plant creates 200 direct jobs on-site, 150 jobs at supporting coal mines and 2,800 indirect jobs throughout the region.

Nuclear

- According to the Nuclear Energy Institute (NEI), a 1,000 MW nuclear plant creates 400-700 permanent jobs.^{xxx}

Natural Gas

- According to NaturalGas.org, natural gas provides the United States with about a quarter of our energy. Data from the Department of Labor shows that distribution of natural gas employed 106,400 people in 2006.

Green Collar Jobs in Congress

- The \$100 million “Sanders-Clinton Energy Efficiency and Renewable Energy Worker Training Program” amendment (S.A. 1502) was adopted as part of the CLEAN Energy Act of 2007 (H.R. 6) which passed in the Senate on June 21, 2007.

- The “Green Jobs Act of 2007” (H.R. 2847), is a \$125 million program for job training in the renewable energy and energy efficiency industry, which was passed with the House Energy bill (H.R. 3221) on August 4th, 2007. The Sanders-Clinton worker training program is designed as a “stand alone” program within the Department of Labor, while the Green Jobs Act of 2007 is designed for the Workforce Investment Act program within the Department of Labor. The House version also has a 3rd grant section specifically for the “Pathways out of Poverty Demonstration Program,” hence the \$25 million difference between the Green Jobs Act of 2007 and the Sanders-Clinton amendment. Despite minor differences, these two pieces of legislation were crafted together and are expected to come together to form one Renewable Energy and Energy Efficiency worker training program.

ⁱ *Economic and Jobs Impacts of the Renewable Energy and Energy Efficiency Industries: U.S. and Ohio*, Roger H. Bezdek of Management Information Services Inc. for American Solar Energy Society, July 2007

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ⁱⁱ *Cashing in on Clean Energy National Analysis*, Union of Concerned Scientists, July 2007

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ⁱⁱⁱ *Putting Renewables to Work: How Many Jobs can the Clean Energy Industry Generate*, Renewable and Appropriate Energy Laboratories, April 2004

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^{iv} *Creating Jobs, Saving Energy and Protecting the Environment: An Analysis of the Potential Impacts of Investing in Efficient Cars & Trucks, a 2007 update*, Union of Concerned Scientists, June 2007

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^v *Opportunity on the Horizon: Photovoltaics in Texas*, IC2 Institute, University of Texas- Austin, June 2007

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^{vi} *Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demands*, American Council for an Energy Efficient Economy, June 2007

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^{vii} *Governor Crist Signs Executive Orders to Reduce Greenhouse Gas Emissions*, Governor Charlie Crist Press Release, July 16 2007

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^{viii} *Renewable Energy and Jobs: Employment Impacts of Developing Markets for Renewables in California*, Environment California Research and Policy Institute, July 2003

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^{ix} *The California Solar Initiative: A monumental step to a million solar roofs*, Environment California, March 2007

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^x *The Washington Clean Energy Initiative: Effects of I-937 on Consumers, Jobs & the Economy*, Union of Concerned Scientists, October 2006

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^{xii} *Massachusetts Clean Energy Industry Census*, Massachusetts Technology Collaborative, Renewable Energy Trust, August 2007

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^{xiii} *Meeting the Targets and Putting Renewables to Work- FLYER*, EU Commission on Monitoring and Modeling Initiative on Targets for Renewable Energy (MITRE)

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^{xiv} *Denmark- Wind Energy Hub*, Danish Wind Energy Association, 2004

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About the Environmental and Energy Study Institute

EESI is a national nonprofit that works to advance a cleaner, more secure and sustainable energy path. EESI was established in 1984 by a bipartisan group of Congressional environmental and energy leaders to meet the critical need for rigorous, informed debate, independent analysis and innovative policy development related to energy and environmental issues.