



SOLAR DECATHLON 2009

Green Jobs

Find Your Place in the New Green
Economy



National Renewable
Energy Laboratory





Agenda

1. What is it
2. Types of jobs
3. Examples from Energy industry
4. Training & Resources
5. Questions & Answers



Green Jobs Defined- EE & RE

- Jobs in the Renewable Energy and the Energy Efficiency industry
 - Workers and revenue in the major RE technologies: wind, photovoltaics, solar thermal, hydroelectric power, geothermal energy, biomass (ethanol, biodiesel, and biomass) and fuel cells and hydrogen.



Green Jobs Defined – EE & RE

- Jobs in the Energy Efficiency industry
 - Energy Services Companies (ESCO's) - such as weatherization, insulation, efficiency remodeling, etc.
 - Energy Efficiency (EE)
 - Workers and revenue that are part of the EE industry - recycling, reuse, remanufacturing
 - Energy Efficient construction firms, green builders and related industries
 - Also workers and revenue in industries in which only a portion of the output is classified within the EE sector – household appliances (Energy Star vs. others) HVAC systems.



Why?

*Choose a job you love
and you will never have
to work a day in your life.*

Confucius



And.....

- Can be defined by either the nature of the job or the nature of the employer.

Jim Cassio, author "Green Careers, Choosing Work for a Sustainable Future."

- A blue collar job that's been upgraded to better respect the environment.....

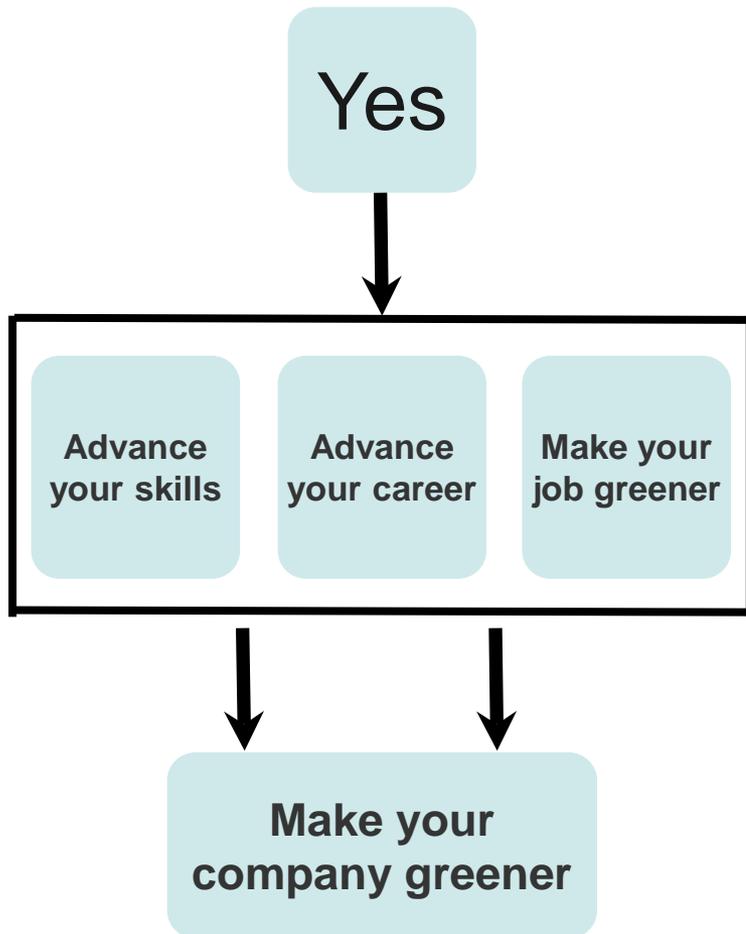
Van Jones, Former White House Special Advisor on Green Jobs

- Employment opportunities in four parts of the green economy: Green Products, Renewable Energy, Green Services, Environmental Conservation.

State of Minnesota's working definition Nov.2008, partial quote



Is your *current* job Green?





A Green product/service

• Is one that:

– Reduces

- impacts on planet
- consumption
- strife/insecurity
- waste

– Increases

- security
- health
- equity/abundance
- local economies

Is Not*:

- Just marketing & greenwashing
- a fad/short term
- based solely on financial profit
- “throw away”/short term products

*Not every job is green, but every *sustainable* industry will have to survive in a carbon-limited “green” economy.



Unique Facets of Green Economy

- **“Cause” factor:** if it’s something we’d do for free anyway, where’s the profit in it?
- Our free-market model is based on growth. How to grow and conserve at the same time?
- My **green** vs. your **green** or **“Can’t we all just get a-lawn”?**
- Silver bullet theory: “Technology will save us!”



Core Green Concepts

1. Putting a price on CO₂ emissions is necessary to build a sustainable market based economy.
2. Triple bottom line business is both practical and necessary: **People**, **Planet**, **Profit**.
3. Clean energy is the essential requirement, then clean water, air, food, and sustainable/clean products.



Green Industries

- **Buildings**
 - Why buildings first? 76% of all utility-provided energy is used to power buildings.
 - US Green Building Council (USGBC)
 - Architecture2030.org
- **Transportation**
 - Public transit
 - Renewable fuels & Vehicles
 - Shipping
- **Energy**
 - Electricity, natural gas, heating/cooling
- **Consumer & Products ----→
Recycling/Reuse**



Types of Green Jobs

Hands-on

- Construction
- Agriculture
- Green mfg
- Landscaping
- Recycling

In office/information

- Engineering/design
- Finance*
- Marketing/PR*
- Analysis/Research

With People

- Education/Training
- Developing economies
- Customer service
- Community organizing



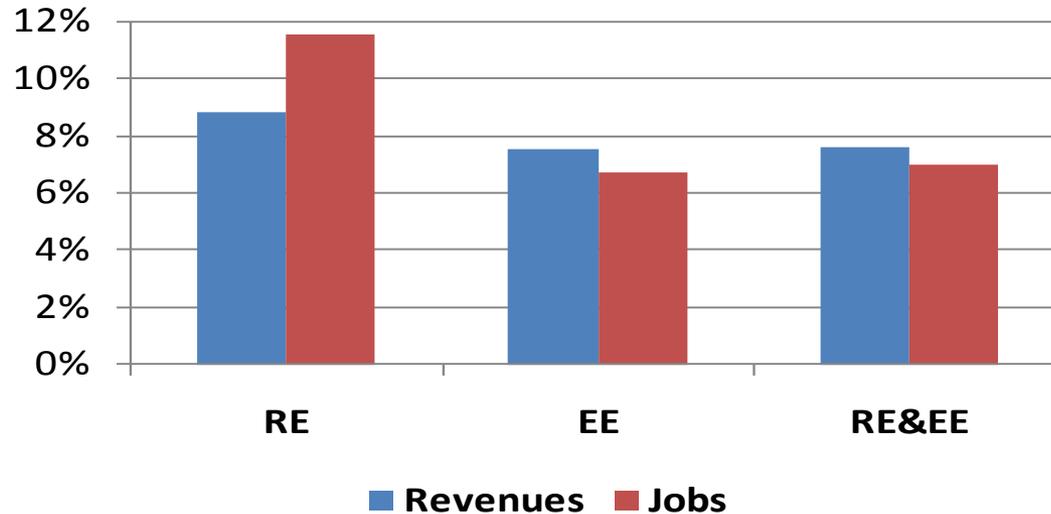
Photos: Wikimedia Commons

John Morris of the University of Maryland takes a breather while working on his team's house.

(Credit: Kaye Evans-Lutterodt/Solar Decathlon)



Renewable Energy & Efficiency



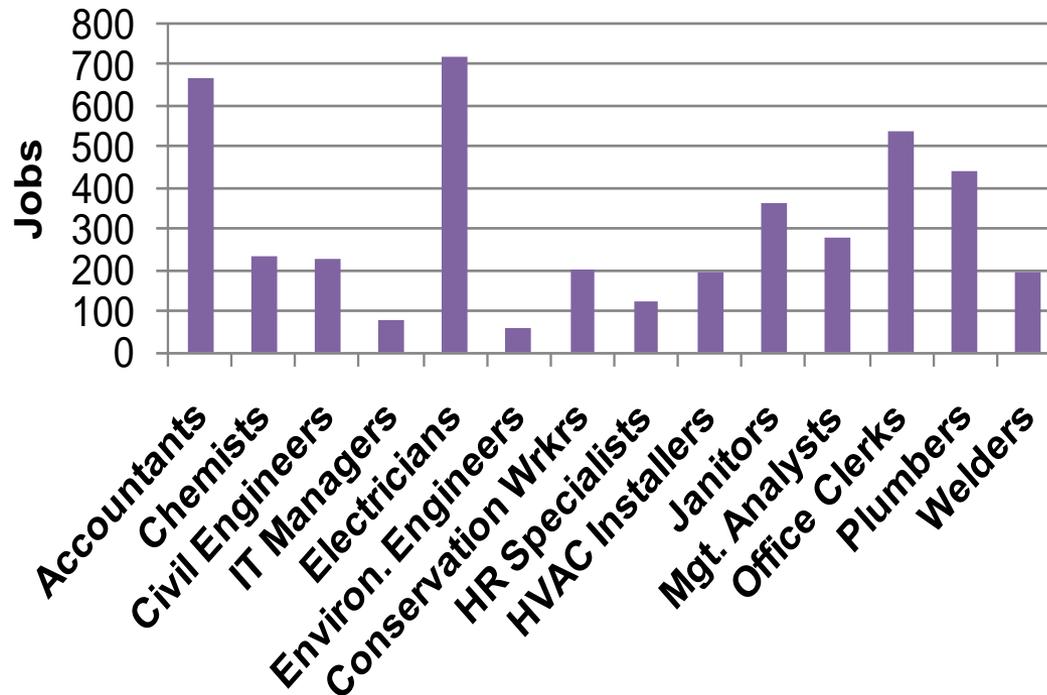
Source: Management Information Services, Inc. and American Solar Energy Society, 2009

RE&EE generated ~ 590,000 “new” jobs between 2006 & 2007
This is significant and noteworthy. However, since December 2007, U.S. employment has fallen by 6.9 million jobs.

Bezdek, Roger H. “American Solar Energy Society’s: Green Collar Jobs in the U.S. and Colorado.” January 2009. American Solar Energy Society, http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf



NEW JOBS CREATED BY RE, 2006 - 2007 (Selected Occupations)



Source: Management Information Services, Inc. and American Solar Energy Society, 2009
 Bezdek, Roger H. "American Solar Energy Society's: Green Collar Jobs in the U.S. and Colorado." January 2009. American Solar Energy Society, http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf



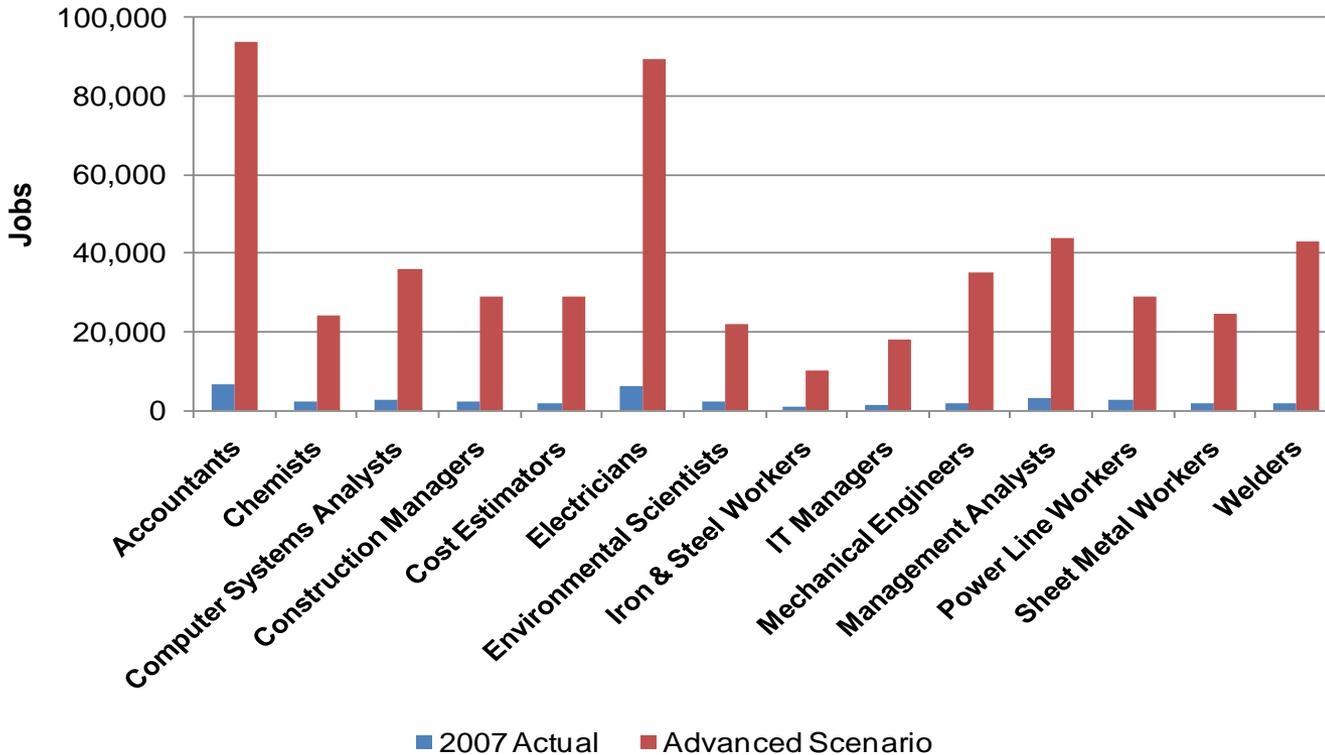
U.S. RE INDUSTRY CHARACTERISTICS IN 2007

- RE gross revenues totaled nearly \$43 billion
- RE industry grew 2006-07 ~ 3 times faster than U.S. average
- The total number of jobs created by RE exceeded 500,000
- More than 95 percent of the jobs were in private industry
- Over 70 percent of the jobs were in the biomass sector – primarily ethanol and biomass power

Bezdek, Roger H. "American Solar Energy Society's: Green Collar Jobs in the U.S. and Colorado." January 2009. American Solar Energy Society, http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf



U.S. JOBS CREATED BY RE IN 2030 (Total Jobs Created -- Selected Occupations)



Source: Management Information Services, Inc. and American Solar Energy Society, 2008.

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National Forecast

U.S. Renewable Energy and Energy Efficiency Industries in 2030

	Revenues (Billions of 2007 Dollars)			Total Jobs Created (Thousands)		
	Base Case	Moderate Scenario	Advanced Scenario	Base Case	Moderate Scenario	Advanced Scenario
RE	\$98	\$212	\$560	1,305	2,846	7,328
EE	\$1,868	\$2,036	\$3,734	14,953	16,658	29,878
Total	\$1,966	\$2,248	\$4,294	16,258	19,504	37,206

Bezdek, Roger H. "American Solar Energy Society's: Green Collar Jobs in the U.S. and Colorado." January 2009. American Solar Energy Society, http://www.ases.org/images/stories/ASES/pdfs/CO_Jobs_Rpt_Jan2009_summary.pdf



Green your job/life

- Start with your own job – do you really need to print that? (1 piece of coal per print job?)
- Employers listen to employees - organize!
- Lose 5,000lbs in one month! Get your fellow workers to take the carbon diet challenge
- Walk the talk. Buy green products, support green programs, vote for green policies.
- Report immoral/illegal environmental practices when you see them - when we all turn our heads we're all blind. All air, water, soil pollution is really local.



Resources

- Florida Solar Energy Center: Education
www.fsec.ucf.edu
- The Southwest Technology Development Institute
www.nmsu.edu/~tdi/Photovoltaics/EducAndTraining/EducTrain.html
- Solar Energy International –
www.solarenergy.org
- Vote Solar – www.votesolar.org



More Resources

- Interstate Renewable Energy Council – “Training Catalog”: www.irecusa.org/trainingcatalog/ and also “Academic Programs in Renewable Energy” catalog
- North American Board of Certified Energy Practitioners www.nabcep.org
- Partnership for Environmental Technology Education www.nationalpete.org
- Department of Energy <http://www.eere.energy.gov/>
- U.S Green Building Council <http://www.usgbc.org>



Resources - Publications

- *“Renewable Energy Training: Best Practices & Recommended Guidelines”* www.irecusa.org
- “Photovoltaic Systems” by National Joint Apprenticeship and Training Committee
www.licensedelectrician.com/Store/AT/Photovoltaic_Sys.htm
- “Get Started Guide 2010” www.solartoday.org/digital



Summary

1. A “green” job is one that helps the planet in some way
2. Global warming necessitates creation of an explicit price on carbon emissions. The opportunity is to add equity and justice to the new paradigms.
3. Green products, Renewable Energy, Energy Efficiency, Green Services, Environmental Conservation
4. Training: community colleges, adult education, networks, self-education/internships/volunteering
5. Government programs. Industry associations. Values-based triple bottom line oriented programs are sustainable. Greenwashing and fad-based programs will fade away.



Thank you

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&

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