

GREEN JOBS: WHAT, WHY, HOW, WHEN & WHERE

Introduction

Have you recently heard terms like: clean tech, green jobs, the clean and green economy, or one of many other similar variations? As a result of the combined challenges of energy security, climate change, fossil fuel resource depletion, environmental pollution, and the current economic downturn, there's a high likelihood you may already be familiar with this terminology. Though the finer details may differ, there are many commonalities among terms like these. For the purposes of this fact sheet, we will focus on the term "green jobs"...from the what and why, to the how, when, and where. Are you now ready for obtaining gainful employment information on green jobs? If so, you are not alone (*Figure 1*)!



Figure 1 Voters in Sarasota, Florida call for Green Jobs Now on the steps of the Federal Building. (Image Courtesy: Flickr user "greenforall.org" via CC By-NC-SA 2.0 License – <http://www.flickr.com/photos/green4all/2907164433/>)

What are Green Jobs?

The United States Bureau of Labor Statistics (BLS) defines green jobs as either:^{1,2}

1. “Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.” (*measured via an output approach regardless of the environmental impact of the production process*)
2. “Jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.” (*measured via a process approach regardless of the environmental impact of the good or service produced*)

Though some states have their own specific definitions, a BLS stakeholder review and analysis of green job definitions revealed several “nearly universal” categories of green job activities and responsibilities (*Table 1*). Florida’s definition captures these universal categories, though it excludes indirect and support-type green jobs and only measures the “direct” production of goods or provision of services.³

Table 1: Examples of BLS Defined Green Jobs⁴

Green Job Category	Green Goods & Services (GGS)	Green Processes
Renewable energy production	Electricity, heat, or fuel generated from renewable sources (e.g., wind, biomass, geothermal, solar, ocean, hydropower, & landfill gas & municipal solid waste)	Generating the GGS from renewable energy sources for use primarily within the establishment (e.g., solar panels on a building rooftop)
Energy efficiency improvements	Electronics, equipment, appliances, buildings, vehicles, & energy storage & distribution (e.g., Smart Grid technologies)	Using GGS to improve energy efficiency within the establishment (e.g., combined heat & power)
Pollution reduction/removal, GHG reduction, & material recycling/reuse	GGS that (1) reduce or eliminate the creation or release of (and/or remove) pollutants or toxic compounds into (from) the environment; (2) reduce GHG emissions via methods other than renewable sources or efficiency (e.g., nuclear sources); & (3) reduce or eliminate the creation of (and/or collect, reuse, remanufacture, recycle, or compost) waste materials or wastewater	Same as GGS column
Natural resources conservation	GGS related to (1) organic agriculture; (2) sustainable forestry; (3) land management; (4) soil, water, or wildlife conservation; & (5) stormwater management	Same as GGS column
Environmental compliance, education/training, & public awareness	GGS that (1) enforce environmental regulations; (2) provide education & training related to green technologies & practices; & (3) increase public awareness of environmental issues	Same as GGS column

Other green job categories that are “hot topics” as of 2011 include local food network infrastructure such as growing, distributing, and purchasing locally produced foods as well as the trading of certificates and offsets in various markets (e.g., acid rain, greenhouse gas emissions, and renewable energy).

¹ <http://www.bls.gov/green/>

² An extensive list of additional “Selected Definitions of Green Industries and Green Jobs,” as documented by the State of Florida Agency for Workforce Innovation (AWI) can be found at http://www.labormarketinfo.com/library/pubs/green/green_definitions.pdf.

³ <http://www.workforceflorida.com/Publications/GreenJobs.php>

⁴ <http://www.bls.gov/green/>

Why are Green Jobs Necessary?

Green jobs have a tall order in addressing the triple bottom line of environmental, social, and economic prosperity. As such, green jobs must address two major challenges. First, they must slow, and ultimately reverse, the degradation of ecosystems and the provisioning, regulating, cultural, and supporting services they provide in benefit to both human and non-human life.⁵ Second, they must mitigate (i.e., make less severe) and adapt (i.e., change to fit within new or different conditions) to the depletion of quantity and degradation in quality of critical natural resources (e.g., minerals, metals, fossil fuels, and water).⁶ These are daunting long-term challenges, yet they are also opportunities for the 21st Century economy as we continue to innovate and respond.

In an October 2009 report “Green-Collar Jobs: Realizing the Promise,” the Sightline Institute, a not-for-profit research and communication center based in Seattle, Washington, suggested that fostering a green economy primarily through the clean energy sector creates more total (and more local) jobs than the fossil fuel sector per dollar of investment, insulates the United States from the extremes of energy price volatility, improves international trade balances by reducing energy imports, and reduces the financial risks of climate change.⁷

The good news is that the seeds for this green economy already exist in many industries and merely need the appropriate social, political, and financial capital to further flourish. The United Nations Environment Program (UNEP) Green Jobs Report predicts four major effects will result from a greening of the global economy and four advantages will be realized by corporations adopting early green innovations (*Table 2*).

Table 2: Effects from Green Jobs and Advantages to Green Innovation

Four Major Effects from Green Jobs ⁸	Corporate Advantages to Green Innovation ⁹
Some additional jobs will be created in new or existing industries (e.g., the manufacture of pollution-control devices and energy efficient technologies)	Improved environmental performance
Some existing employment will be substituted for other types of employment (e.g., the shift in jobs from fossil fuel industries to renewable energy industries)	Early access to export markets for their innovations
Some jobs may be eliminated without direct replacement (e.g., expendable toxic products or services without greener replacements)	Improved opportunities to attract and retain qualified workers who are increasingly looking for greener jobs and employers
Many existing jobs will be transformed and redefined as skills, practices, and methods are greened (e.g., building design professionals and construction trade workers)	Management experience in transforming their companies that may help them confront other challenges and also may generate the sale of management services and know-how to others

⁵ Green Facts: Facts on Health and the Environment. <http://www.greenfacts.org/en/digests/themesindex.htm>

⁶ The Encyclopedia of Earth. <http://www.eoearth.org/>

⁷ <http://www.sightline.org/research/jobs/green-jobs-primer?gclid=CN2mgPHgx58CFQJinAodhh2nzg>

⁸ Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World, UNEP/ILO/IOE/ITUC, September 2008. (Page 3, http://www.unep.org/labour_environment/features/greenjobs.asp)

⁹ See bullets 59, page 18 in: http://www.unep.org/labour_environment/PDFs/Green-Jobs-Background-paper-18-01-08.pdf

How Can You Enter into the Green Jobs Market?

Unfortunately, there is no central clearinghouse of job opportunities within the emerging green economy. Yet, this is because green job opportunities are so widely distributed across industries (i.e., products and services produced) and occupations (i.e., type of work performed). More importantly, the green economy may become an enabler for under-represented people and groups (Figure 2).¹⁰ As a green jobs seeker, the keys to a successful search will be to learn about the industries and occupations being monitored for green job activity and the skill sets necessary for potential applicants for these jobs.

Floridians are fortunate to have a dedicated green jobs portal. Employ Florida provides an “online career resource for individuals seeking information on green jobs, green training, and green jobs survey results.”

<http://greenjobs.employflorida.com>

At a national level, the BLS is the definitive Federal agency monitoring these activities, so this is the best place to begin honing your green job seeking skills. Another good place to begin is by searching for industries and occupations as previously laid out in Table 1. Approximately 75% of these green jobs will come from two industry sectors – construction (38.1% or 820,700 establishments) and professional and business services (36.2% or 779,100 establishments).¹¹

The career opportunities and skill sets necessary for these two industry sectors is exemplified in the biannual U.S. Department of Energy Solar Decathlon and its international counterparts.¹² Through all stages of the Solar Decathlon Europe 2010 competition, from the candidate application process to the engineering, designing, and communications campaigns...from the deconstruction and reuse of an old home’s materials to the assembly and disassembly of the modular solar powered home in both Gainesville, Florida and Madrid, Spain...the University of Florida’s interdisciplinary “Team Re-Focus” engaged in a form of immersive green jobs training via “hands-on learning” (Figure 3). The domestic Solar Decathlon 2011, “Team Florida,” a consortium of four



Figure 2. “Rosie the Riveter” became emblematic of the empowerment of women in the 1950s and their important role in creating the military capacity to fight World War II. As we embark on the emerging green economy in the 21st Century, new forms of empowerment may take shape, like efforts to train military veterans for clean, green jobs. (Image Courtesy: Veterans Green Jobs - <http://veteransgreenjobs.org/about-us/calling-rosies-female-veterans>)

¹⁰ Veterans Green Jobs is a nonprofit organization with a mission “to connect military veterans with meaningful employment opportunities that serve our communities and environment.” (<http://veteransgreenjobs.org/>)

¹¹ Though “professional services” and “business services” are sometimes considered separate sectors, the BLS groups them together for the purposes of its green jobs tracking approaches.

¹² <http://www.solardecathlon.gov/>

universities across the State of Florida, will be one of only 20 international teams in this esteemed competition to be held in Fall 2011.¹³ Who knew green job training could be so fun...and so internationally flavored!



Figure 3. Team Re-Focus” poses for a photo with their modular home entry in the Solar Decathlon Europe 2010 competition. (Image Courtesy: University of Florida - <http://solardecathlon.ufl.edu/> and <http://www.facebook.com/projectrefocus>)¹⁴

What is Not Measured as a Green Job...and Why?

As you can imagine from the complexities associated with defining the term “green” with regard to jobs, goods, and services, there is an opportunity for misrepresentation or confusion in comparing the metaphorical apples to oranges. This is why the BLS established an official green jobs definition published in the Federal Register¹⁵ to be measured and verified in a rigorous and statistically sound methodology. However, for further clarification of the most common misconceptions and limitations about green jobs, we have excerpted and summarized some of the BLS Frequently Asked Questions (FAQs) in Table 3.

¹³ <http://www.flexhouse.org/>

¹⁴ Image source: <http://www.facebook.com/photo.php?fbid=403694283322&set=a.445990738322.236763.105061853322>

¹⁵ http://www.bls.gov/green/frn_2010_09_21.pdf

Table 3: Examples of BLS Non-Measured Economic Activities and Issues that May be Confused with Green Jobs¹⁶

Job, Good, Service, or Other Criteria	Reason Not Measured or Integrated into BLS Data
Transportation and distribution of green goods	No added benefit to environment from transportation or distribution of a green good versus any other good
Self employed workers	A limitation stemming from the BLS business list used as the national green job sampling frame
Social equity issues such as wages, union status, safety, benefits, etc.	Involves subjectivity that is inappropriate for a statistical agency such as BLS to measure <i>(Note: Some organizations, such as the UNEP, suggest these human equity and “decent work” considerations are deeply embedded in the “Just Transition” to a global green economy)</i>
Demographic characteristics of green jobs	Not relevant to BLS data stream, but can be found from other sources and matched to BLS data by end users as needed
Processing of organic agricultural products	Though these organic products themselves are measured in green job calculations, the processing component is not measured as there is no added benefit to environment from processing of organic versus conventional agriculture (i.e., benefit takes place during growth stage, not processing stage)
Products made from recycled content	Environmental benefits of materials (e.g., metals, glass, and paper pulp) containing recycled inputs occurs during raw material manufacture, not during the addition of these recycled raw materials into secondary goods (e.g., metal roofing and office paper)
Goods and services forming a “minority of revenue” from North American Industry Classification System (NAICS) firms	BLS data only measures green jobs from NAICS industries who earn a majority of their revenue from qualifying green jobs and services <i>(Note: The scope and scale of green jobs associated with these minority revenue goods and services is unknown, though recognized as a limitation in BLS measurement.)</i>

Furthermore, as terms like “green,” “environmentally or eco-friendly,” and “carbon offset,” have expanded throughout various industries over the last two decades, there is an increasing concern about the potential for “greenwashing,” or unsubstantiated, over-stated, or misleading claims about the environmental impact of a good or service. As a result of these concerns the Federal Trade Commission (FTC) has a series of “Green Guides” to assist marketers with how to best and most accurately use these terms without misleading consumers. For more information about these Green Guides and a recent review expanding the terms they are covering, visit the following links:

- FTC: Part 260 – Guides for the Use of Environmental Marketing Claims
<http://ftc.gov/bcp/grnrule/guides980427.htm>
- FTC Eco in the Market – Green Guides Review: Proposed Revisions to Green Guides
http://www.ftc.gov/bcp/edu/microsites/energy/about_guides.shtml

¹⁶ <http://www.bls.gov/green/>

What Legislation is Enabling the Green Jobs Market?

In response to these needs for green jobs, the Federal government implemented the Green Jobs Act (GJA) of 2007 as an amendment to the Workforce Investment Act (WIA). The GJA authorizes \$125 million annually for an Energy Efficiency and Renewable Energy Worker Training Program. This pilot program identifies the skills necessary for the emerging green jobs marketplace, then develops and delivers training programs in a broad range of industries. However, special attention is paid to fostering “green pathways out of poverty,” which falls in line with international green job goals expressed by the UNEP. More recently, the U.S. Congress appropriated \$500 million for the GJA via the American Recovery and Reinvestment Act (ARRA) of February 2009. For more information, visit the GJA page summarized by Green for All, “a national organization working to build an inclusive green economy strong enough to lift people out of poverty.”

- Green for All: The Green Jobs Act
<http://www.greenforall.org/what-we-do/working-with-washington/the-green-jobs-act>
- Green for All: Policy & Legislation (A Sampling at Federal, State, and Local Levels)
<http://www.greenforall.org/resources/policy-legislation>

When Will the Green Jobs Market Reach Maturity?

“The goal of the BLS green jobs initiative is to develop information on (1) the number of and trend over time in green jobs, (2) the industrial, occupational, and geographic distribution of the jobs, and (3) the wages of the workers in these jobs.”¹⁷ By measuring these trends and benchmarks, the BLS will collect the data necessary to monitor the evolution of the green job marketplace.

As mentioned earlier, the BLS will use two approaches to measuring national green jobs.¹⁸ The *output approach* will be affiliated with the BLS Occupational Employment Statistics (OES) program and use a “Green Goods and Services” (GGS) survey. This GGS survey is under development with preliminary data collection in early 2011, data publication in Spring 2012, and annual updates thereafter. The *process approach* will use a “special employer green process survey,” which is under development with preliminary data collection in Summer 2011, data publication in Summer 2012, and no definitive recurrence schedule yet determined. Despite these BLS market measurement standardization efforts, individual states may take different approaches than the BLS process.¹⁹ In Florida, a “Green Jobs Survey” was conducted in 2010 with results expected to be published in the spring of 2011.²⁰

However, defining a singular point in time when the green economy reaches maturity is not truly possible. In fact, in some ways a mature green jobs market is a dynamic moving target with a relative baseline that will always recede into the horizon just like the moving target of sustainability (i.e., providing for future generations while meeting the needs of the present).²¹ Key concepts and principles that may become evident as the green job marketplace matures beyond its current early stages include: (1) integrated and transdisciplinary collaboration; (2) productivity measures linking the triple bottom line of the environment, society, and economy; (3) a “just transition” in green job availability and skill development for all of humanity; and (4) a fair balance in public sector policy, private sector innovation, and financial sector capitalization and enabling mechanisms.^{22, 23}

¹⁷ <http://www.bls.gov/green/>

¹⁸ <http://www.bls.gov/green/>

¹⁹ <http://www.labormarketinfo.edd.ca.gov/?pageid=1032>

²⁰ http://www.labormarketinfo.com/library/green_press_release.pdf & <http://greenjobs.employflorida.com>

²¹ See bullet 12, page 7 in: http://www.unep.org/labour_environment/PDFs/Green-Jobs-Background-paper-18-01-08.pdf

²² See bullets 58, page 18 in: http://www.unep.org/labour_environment/PDFs/Green-Jobs-Background-paper-18-01-08.pdf

Where Does FESC Fit into the Green Jobs Marketplace?

Many aspects of the green jobs marketplace are deeply connected to our long-term energy future. As such, the Florida Energy Systems Consortium (FESC), a collection of 11 state universities assisting the Florida state government with the development and implementation of an environmentally compatible, sustainable, and efficient energy strategic plan, is well positioned to support Florida's emerging green jobs infrastructure and training. We encourage you to explore the sub-menus on the left side of http://www.floridaenergy.ufl.edu/?page_id=9 for more information on Florida energy education opportunities sorted by discipline, institution, and degree program, along with training providers and other energy education-related resources.

References and Resources

Beyond the footnotes, see the following links for more information about “green jobs / green collar jobs”:

- The PEW Charitable Trusts – The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America
http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf
- UNEP – Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World
http://www.unep.org/labour_environment/features/greenjobs.asp
- U.S. Department of Labor – Bureau of Labor Statistics: Measuring Green Jobs
<http://www.bls.gov/green/>
- Workforce Florida, Inc. – Defining Green Jobs for Florida
http://www.workforceflorida.com/news/docking/GreenJobsReport_6-17-09_ExComApproved.pdf

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²³ Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World, UNEP/ILO/IOE/ITUC, September 2008. (Page 24, http://www.unep.org/labour_environment/features/greenjobs.asp). The term “just transition” reinforces the UNEP’s goal to use the green economy as a catalyst to bring people out of poverty by encouraging social justice and equal representation of all people in the transition from our current global economy and its inequalities toward a more socially just, greener economy.