

# BUILDING WINDMILLS IN THE GREEN ECONOMY

By Janet E. Wall



*I swear by the sun and its brilliance  
And the moon when it follows the sun  
And the day when it shows it  
And the night when it draws a veil over it  
And the heaven and Him Who made it  
And the earth and Him Who extended it  
And the soul and Him Who made it perfect  
Then He inspired it to understand what is right  
and wrong for it  
He will indeed be successful who purifies it  
And he will indeed fail who corrupts it.*

— from the Quran

**M**ore than 40 years ago, man walked on the moon for the first time and looked back to planet Earth observing its beauty and fragility. During that time, we, as crew on spaceship Earth, have continued to deplete our planet's resources, pollute and warm its oceans and atmosphere, and destroy its biosphere. The good news, if there is any, is that we seem to have become more conscious of our responsibility for preserving the planet, and of our opportunity to do so. It seems there is a movement to "go green."

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Tom Friedman, in *Hot, Flat and Crowded*, emphasizes the vital economic and security aspects of the green movement by stating that going green will make the US “stronger, healthier, more secure, more innovative, more competitive, and more respected” (p.173). President Obama and his administration are seizing the opportunity to preserve our planet through policy emphases on conserving our resources, reducing our dependence on foreign oil, and combating global warming through a reduction in carbon emissions, by focusing on the creation and promotion of so-called “green jobs.”

Concurrently, and with the intent of boosting the US economy, the US Department of Labor recently released several hundred million dollars to states for the purpose of stimulating economic growth through training in green jobs, as part of the American Recovery and Reinvestment Act (ARRA) of 2009. Other ARRA efforts include billions for smarter grid technology, smart electrical meters, weatherization projects, retrofitting federal building, and new battery technology, to name just a few.

These government initiatives, coupled with related efforts in the private sector to enhance and grow the US economy, are poised to create a fertile landscape for job creation while improving our environment.

## Identifying the Elusive Green Job

Green jobs and careers are hot topics on the Internet, in various books and newspapers, and on TV. The press has popularized “going green” to various approaches from changing to compact fluorescent light bulbs to installing solar panels on buildings. Defining green jobs and careers, however, has been troublesome at best, suggests Kathleen T. Green of the Bureau of Labor Statistics. For example, if a person is an

administrative assistant in a solar panel manufacturing plant, is that a green job because of the industry, or is it not because of the specific job tasks? Or consider the construction worker who could be retrofitting a building to be more energy efficient one day, and then the next day be working on a traditional construction project.

Career development professionals are speaking to students and job seekers about the benefits of green careers, but there is considerable confusion as to what this means. Complicating the issue is that there has not been much consensus on what green jobs and careers really are, and how to define, identify, and understand them. Work is moving forward on that front, however.

Of late, the National Center for O\*NET Development, a grantee to the Department of Labor, has been conducting methodical and purposeful research on green jobs and occupations. In the last few months, it has released a report on the green economy and what occupations might be labeled as green. Its research, based on an extensive literature review, defined the green economy as “related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas emissions, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy” (Dierdorf, et. al, 2009, p. 8).

The report concluded that labeling an occupation or job “green” is not a useful concept as such. Instead, the greening economy and associated new technologies are having varying effects on occupations. For some occupations, the green economy will not significantly change the skill set required, but for others, it will substantially transform the occupation or even give birth to new occupations such as energy brokers or fuel cell technicians.

The report concludes that the concept of greening of occupations involves three outcomes:

- > **Increased Demand** -- work context may change, but the tasks do not; increased need for workers in these occupations;
- > **Modified Skills Sets** -- significant change to the work and worker requirements of an existing occupation which may or may not result in an increase in employment demand for the occupation; and/or
- > **Unique New Work** - new work and worker requirements, resulting in a new occupation which could evolve from an existing occupation with new technologies, or be entirely novel.

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**These occupations are most consistently found in 12 industrial sectors:**

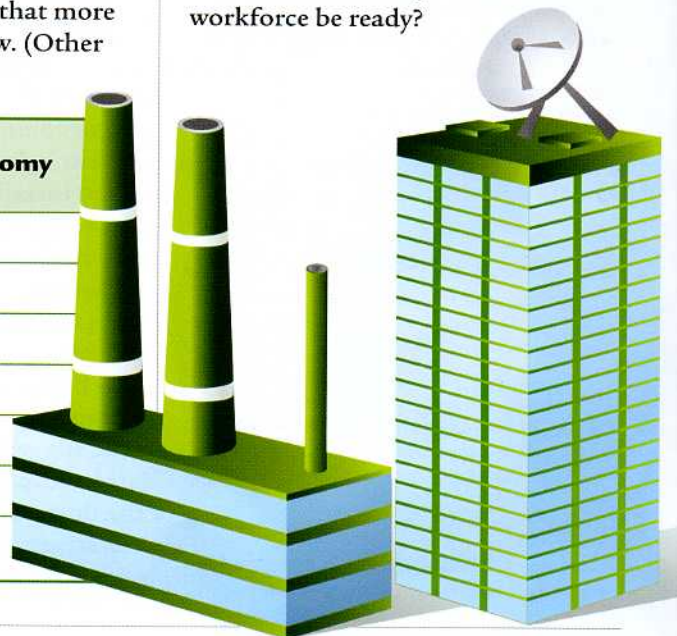
- ✓ **Renewable Energy Generation** – wind, solar, geothermal and biomass
- ✓ **Transportation** – trucking, mass transit and freight rail
- ✓ **Energy Efficiency** – responsive energy demand, smart grids, etc.
- ✓ **Green Construction** – green buildings, retrofitting buildings, installing green technology
- ✓ **Energy Trading** – financial services related to buying and selling energy and carbon trading
- ✓ **Energy and Carbon Capture and Storage** – capturing and storing energy or carbon emissions and power plant technology
- ✓ **Research, Design, and Consulting Services** – energy consulting, research or other business services
- ✓ **Environment Protection** – environmental remediation, climate change adaptation, improving air quality
- ✓ **Agriculture and Forestry** – natural pesticides, aquaculture, and land management
- ✓ **Manufacturing** – green technology creating and manufacturing processes
- ✓ **Recycling and Waste Reduction** – solid and water waste treatment, reduction, and management; recycling
- ✓ **Governmental and Regulatory Administration** – activities by organizations that are connected with conservation, pollution prevention, regulation creation and enforcement, and advocacy

To date, the O\*NET Center has identified 215 occupations in those industries. A full listing can be found in its report, “The Greening of the World of Work.” Many of these occupations are now in the O\*NET database and others will be included shortly.

**Some Employment Projections and Predictions**

Global Insight (2008), in a report to The United States Conference of Mayors and the Mayors Climate Protection Center, suggests that “the potential growth in green jobs is significant in that it could be the fastest growing segment of the United States economy over the next several decades” (p. 20). It found that more than 750,000 persons are already working in green jobs as shown below. (Other estimates are as high as 8 million.)

JOB CATEGORY	Number in US Economy
Renewable Power Generation	127,246
Agriculture and Forestry	57,546
Construction & Systems Installation	8,741
Manufacturing	60,699
Equipment Dealers & Wholesalers	6,205
Engineering, Legal, Research & Consulting	418,715
Government Administration	71,900



Just in the areas of Renewable Power Generation, Residential & Commercial Retrofitting, Renewable Transportation Fuels Engineering, and Legal, Research & Consulting, the study projected that by 2018 an additional 2.5 million jobs will be created; by 2028, that increases to almost 3.5 million, and by 2038, 4.2 million. If realized, that is an important and impressive contribution to the economy.

Environment-related occupations are on a path to grow 52% from 2000 to 2016 as compared to 14% for all other occupations. According to the Council of Economic Advisors (2009, p. 8) in its recent report to the President, “these environmental jobs account for only a small fraction of a growing list of occupations and industries that are becoming increasingly devoted to clean energy production, energy efficiency, and environmental protection.”

So, significant employment opportunities will be found in green economy sectors. These green jobs will give shades of green to what we now think of as blue collar and white collar jobs, but they will require a skilled workforce.

**Developing Green Worker Talent**

All signs point to a green economy as red hot and becoming hotter in the future, but will the workforce be ready?

**EDUCATION.** Today's economy requires higher skilled workers in jobs that require them to be flexible and complete tasks that are non-routine and more analytic. Occupations that are associated with higher educational attainment, including those supporting the green economy, are projected to grow much faster than those with lower education requirements. The fastest growth should occur in occupations that require an associate degree or a post-secondary vocational award. The link between postsecondary education and training and higher pay is well established.

Each year, by some accounts, about 30 % of students entering high school do not even earn a high school diploma! More than 12 million students will drop out of school during the next decade if we stay on the same track. Persons without the necessary skills could be left by the wayside as the green economy thrives, expands, and produces good paying jobs.

#### **RANGE OF OPPORTUNITY.**

Although high skilled persons are needed for all industries and sectors, there is room in the green economy for persons with various skill levels from GED through PhD. In testimony to the House Education and Labor committee, Kathy Krepcio (2009) emphasized that the amount of education and training needed for green jobs differs depending on the specific job, and that many jobs will merely add a "green skill layer" to skills typically expected of an employee. Some green jobs may require a special credential, but that may well depend on what is desired by an employer and could differ state to state.

#### **KEEPING JOBS AT HOME.**

Taking advantage of the expanding green economy means we need to develop the worker talent within our own borders and reduce the offshoring of our good jobs. Other countries are fully aware that the

green economy requires talent in basic skills, technology, and innovation. Many are focused on green technology development, manufacturing, and use. Friedman (2008) contends that a strong green economy should be the patriotic rallying flag for the US if we wish to strengthen our economic power and security.

*When the wind blows, some people build walls and others build windmills.*

#### **WORKER SKILLS TRANSFER.**

The downsizing or shuttering of many companies has left many skilled workers sidelined, and the nation with a soaring unemployment rate. Unemployed workers need information on how their skills can transfer to new occupations and industries. They need to identify their skill gaps and find programs to close those gaps, making them attractive to employers in other businesses and industries, thereby enabling them to transfer into jobs that have good pay and a brighter future. This may be particularly true for those jobs catalyzed by the greening of the world of work.

**TRAINING.** Community colleges are well known for providing low-cost, excellent job training, and they are taking a strong lead in executing programs in the green economy. But there are problems in the system due to high dropout rates and non-completion due to the lack of student preparedness. Even with this cost-beneficial opportunity and the cry for a skilled workforce in the private sector, American workers obtain fewer training hours than in many other developed countries (Council on Competitiveness, p. 98).

### **What Career Development Professionals Can Do**

#### **1. Stay on top of developments in this new and growing field.**

Various agencies are working to identify how many green jobs there are now, how many are being created, the degree of job-training required, and the likely demand for workers in the future. Watch for the green economy's impact on job opportunities, and also in revised resources such as the Occupational Outlook Handbook and the O\*NET database.

#### **2. Encourage workers to stay abreast of the economic changes and prepare themselves for an economy where educational and training demands will change and increase along with new job opportunities.**

They will likely do that based on your advice and knowledge of the latest information, not only in your local area, but also nationally. Worker flexibility will be key in this dynamic economy.

#### **3. Help workers in transition identify how their skills fit within the green economy and how to close any skills gaps they have to qualify for and be successful in the jobs they seek.**

This will require continued attention to the career development cycle starting with assessment of skills and continuing with career decision making, planning, preparation, and management.

#### **4. Start introducing the concept of educating for a green career at a younger age.**

Be sure that youth understand that the green economy is growing. But to contribute to this growth and to stay employable, it requires an attitude of perpetual learning and career management and transition. Focusing on career and college readiness will help youth be ready for whatever changes occur in the US and global economies.



## 5. Be familiar with the training programs in your area.

Some green economy opportunities are optimized locally or regionally, such as wind energy creation (Columbia River Gorge or the plains of Iowa) or solar energy (southwestern states). Companies are establishing jobs and creating training programs in cooperation with community colleges to take advantage of geographical assets. Other opportunities come without particular borders such as weatherization, regulation, research and development, regulation, and recycling.

### A Green Future?

Although the fog of uncertainty obscures a definitive prediction of the future, let it be said that it's looking green! To paraphrase a Chinese saying, when the wind blows, some people build walls and others build windmills. Let's build our windmills literally and figuratively to take advantage of this



opportunity to enhance the green economy and improve our planet.

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### RESOURCES

- Environmental Defense Fund, Green Jobs Guidebook [http://edf.org/documents/8490\\_Green%20Jobs%20Guidebook%20FINAL.pdf](http://edf.org/documents/8490_Green%20Jobs%20Guidebook%20FINAL.pdf)
- US Department of Labor, Summer, 2009.
- Going Green: Environment al Jobs for Scientists and Engineers <http://www.bls.gov/opub/ooq/2009/summer/art01.pdf>
- Career Voyages <http://careervoyages.gov/green-main.cfm>



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