C2ER THE COUNCIL FOR COMMUNITY AND ECONOMIC RESEARCH

ARIZONA GREEN OCCUPATIONAL PROFILES

Prepared for the Office of Employment and Population Statistics, Arizona Department of Administration

August 2011

Credits and Disclaimer:

This report was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The report does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. State of Arizona has the copyright to this report. Internal use by an organization and/or personal use by an individual for non-commercial purposes is permissible. All other uses require the prior authorization of the copyright owner.

1700 N. MOORE STREET, SUITE 2225, PO BOX 100127, ARLINGTON, VA 22210
703-522-4980 WWW.C2ER.ORG

Occupational Profiles: Growth Jobs Requiring Green Skills

The following profile is one of several profiles created to provide background on emerging employment opportunities for key green occupations. Occupations were defined based on Standard Occupational Classification (SOC) code used to define occupations within the Occupational Employment Statistics program of the Bureau of Labor Statistics (http://www.bls.gov/soc/home.htm). The profiles can be useful to a variety of user groups, including job seekers, new graduates, new-to-career adults, career counselors and others as they seek to understand growing occupations that frequently support green activities or require green skills. For each occupation, wherever data are available, these profiles describe:

I. **What is the job?**
This section provides a description of the job, background on the activities involved, what types of green activities might be performed, and a list of comparable jobs.

II. **Where are the jobs currently?**
This section shows how many people were employed in this occupation (including those green and non-green jobs), how many green positions were available recently, and what industries typically employ workers in this occupation.

III. **What could workers earn in this occupation?**
This section shows the historical average wages associated with all jobs (green and non-green) in these occupations in different parts of the state, as well as the median green wage as advertised in recent online job postings.

IV. **What is the outlook for jobs in this occupation?**
This section shows the extent to which there is projected long-term demand for workers in these occupations. Recognizing that long-term projections data about jobs requiring green skills are not available, the projections include information about all jobs in the occupation.

V. **How do workers prepare for jobs in this occupation?**
This section provides details on the training, certifications, education and work experience required for these occupations. Whenever possible, certifications tied to green-related activities are highlighted.

Occupations profiled were selected using quantitative and qualitative data obtained through research efforts under the Arizona State Labor Market Information Improvement Grant Initiative. Various data sources were used in creating the occupational profiles as outlined below.

- Occupational Information Network (O*NET) data were used as a measure of the skills, knowledge, and abilities required for the occupations. Certification, training, and education related information was also obtained from O*NET (http://www.onetonline.org/)
- The Arizona Green Jobs Survey was used to identify and classify the components of the job that are green and common certifications held by green workers within an occupation (http://azstats.gov/)
- Employment and wage estimates are from the Occupational Employment Statistics (OES) program. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. Self-employed persons are not included in the estimates. These estimates are for the state, and for metropolitan and nonmetropolitan areas (http://www.bls.gov/oes/)
- Postings and wage estimates from advertised online jobs were provided by Burning Glass, a private company. It is to be noted that these are advertised positions and wages that reflect the vacancies

within the occupations and are not necessarily realized employment or earnings (http://www.burning-glass.com/)
- Data on the industries employing the workers within respective occupations were obtained from Economic Modeling Specialists Inc. (EMSI) (http://www.emsinet.com/)
- Long term employment projections were from the Office of Employment and Population Statistics (http://azstats.gov/)
- Focus groups with industry leaders and stakeholders
- Input from the Arizona Project Steering Committee and Green Economy Advisory Committee

Occupations included in these profiles were selected based on anticipated positive job growth. Efforts were made to include a diversity of job types to meet the needs of a variety of job seekers, employers, and trainers. Whenever unique information is available for green occupations, disaggregated data for both green and non-green occupations are provided. Where green data are not available, information provided is an aggregate of both green and non-green (with this data gap noted in the profile). The goal is to provide job seekers, employers, and trainers with the most complete picture available of the status of the occupation and related career opportunities.

General Table Note: Cases where fields are marked N/A indicate that no data were available for the occupation.

Occupational Profile for Engineering Managers

11-9041.00

I. What is the job?

The focus of this section is to provide a description of the job; background on the activities involved; types of green activities that might be performed within this job; and a list of comparable jobs.

Job description:
Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*

What do these workers do?
Analyze technology, resource needs, and market demand, to plan and assess the feasibility of projects.
Confer with management, production, and marketing staff to discuss project specifications and procedures.
Consult or negotiate with clients to prepare project specifications.
Coordinate and direct projects, making detailed plans to accomplish goals and directing the integration of technical activities.
Develop and implement policies, standards and procedures for the engineering and technical work performed in the department, service, laboratory or firm.
Direct, review, and approve product design and changes.
Perform administrative functions such as reviewing and writing reports, approving expenditures, enforcing rules, and making decisions about the purchase of materials or services.
Prepare budgets, bids, and contracts, and direct the negotiation of research contracts.
Present and explain proposals, reports, and findings to clients.
Recruit employees, assign, direct, and evaluate their work, and oversee the development and maintenance of staff competence.
Review and recommend or approve contracts and cost estimates.

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*

How might this job be green?
Retrofit electrical and plumbing fixtures
Provide oversight of remediation, restoration, and watershed projects and staff
Provide environmental permitting services to public and private industry
Provide air analysis and consulting
Work on environmental efficiency and impact
Civil engineering and project management
Develop Electrical Systems to reduce electrical consumption
Green Building design and planning oversight

Source: Arizona LMI Green Jobs Survey, http://azstats.gov/

What are the related occupations that offer jobs for these workers?
Aerospace Engineers
Civil Engineers
Industrial Safety and Health Engineers
Marine Engineers
Marine Architects
Mining and Geological Engineers, Including Mining Safety Engineers
Nuclear Engineers
Petroleum Engineers
Electrical Drafters

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*

II. Where are these jobs currently?

This section shows how many people were employed in this occupation (including both green and non-green jobs); how many green positions were available recently; and what industries typically employ workers in this occupation.

How many people do this job? (Data are not available for green jobs within the occupation so this total is based on data that include both green and non-green jobs. Employment numbers do not include self-employed and unpaid family members.)	
Area	**Employment Total (May 2010)**
Flagstaff, AZ	**N/A**
Lake Havasu City-Kingman, AZ	**N/A**
Phoenix-Mesa-Scottsdale, AZ	2,220
Prescott, AZ	**N/A**
Tucson, AZ	580
Yuma, AZ	**N/A**
Rest of Arizona	160

Source: OES Employment Estimates, Bureau of Labor Statistics, (May 2010), http://www.bls.gov/oes/

How many green jobs were advertised as available recently? (Based on online job advertisements, April 1 - June 30, 2011)		
MSA	**All Job Postings**	**Green* Job Postings**
Flagstaff, AZ	0	0
Lake Havasu City-Kingman, AZ	1	1
Phoenix-Mesa-Scottsdale, AZ	312	41
Prescott, AZ	7	2
Tucson, AZ	35	11
Yuma, AZ	2	1
Rest of Arizona	25	0

**Green jobs identified using green definitions from O*Net and refined using a combination of green skills, certifications, and keywords from the advertised job descriptions.*

Source: Burning Glass, http://www.burning-glass.com/

Which industries employ workers in this job?
Engineering Services
Semiconductor and Related Device Manufacturing
Guided Missile and Space Vehicle Manufacturing
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
Federal government, civilian, except postal service
Aircraft Engine and Engine Parts Manufacturing
Local government
Corporate, Subsidiary, and Regional Managing Offices
Aircraft Manufacturing
Other Aircraft Parts and Auxiliary Equipment Manufacturing
Fossil Fuel Electric Power Generation
State government
Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
Computer Systems Design Services
Custom Computer Programming Services
Architectural Services
Administrative Management and General Management Consulting Services
Bare Printed Circuit Board Manufacturing
Testing Laboratories
Electric Power Distribution

Source: EMSI (Economic Modeling Specialists Inc.), http://www.emsinet.com/

III. What could workers earn in this occupation?

This section shows the average wages associated with this occupation in different areas of the state, as well as the median green wage as advertised in online job postings.

What are the wages paid to workers in this field? (Data are not available for green jobs within the occupation so this section is based on data that include both green and non-green jobs. Wage estimates do not include self-employed and unpaid family members .)						
MSA	**10th Percentile**	**25th Percentile**	**Median**	**Mean**	**75th Percentile**	**90th Percentile**
Flagstaff, AZ	$86,670	$100,770	$136,390	$128,270	$155,310	N/A
Lake Havasu City-Kingman, AZ	**N/A**					
Phoenix-Mesa-Scottsdale, AZ	$76,770	$98,080	$122,110	$126,890	$150,030	N/A
Prescott, AZ	**N/A**					
Tucson, AZ	$81,970	$93,470	$115,820	$127,200	$151,440	N/A
Yuma, AZ	**N/A**					
Rest of Arizona	$60,290	$82,440	$104,970	$100,270	$118,110	$130,805

Source: OES Employment Estimates, Bureau of Labor Statistics, (May 2010), http://www.bls.gov/oes/

What is the median wage advertised for green workers in this occupation? (Statewide median wages based on advertised salaries in online job postings between March 2010 and March 2011.)	
Median Advertised Wage for All Jobs	**Median Advertised Wage for Green* Jobs**
$ 100,000	$ 115,000

**Green jobs identified using green definitions from O*Net and refined using a combination of green skills, certifications, and keywords from the advertised job descriptions.*

Source: Burning Glass, http://www.burning-glass.com/

IV. What is the outlook for jobs in this occupation?

This section shows the long-term projected outlook for this occupation.

What is the long term outlook for jobs in this occupation? (Data are not available for green jobs within the occupation so this section is based on data that include both green and non-green jobs. Employment numbers include self-employed and unpaid family members as well as wage and salary workers.)						
2008 Employment (Estimated)	2018 Employment (Projected)	Change (2008-2018)		Estimated Replacement Needs (2008-2018)*		Estimated Total Openings (2008-2018)**
4,901	4,979	78	+	995	=	1,073

**Replacement jobs are estimated by applying a ratio of total national job changes anticipated over the next decade (derived by BLS) to the estimated Arizona 2008 employment*

***Openings represent the sum of growth (change) and replacement*

Source: Arizona Office of Employment and Population Statistics, http://azstats.gov/

V. How do workers prepare for jobs in this occupation?

Training, certification, education, and required work experience information for the occupation, based primarily upon survey results provided by the national O*Net OnLine occupational database.

What are the minimum education levels that employers expect for workers in this occupation? (Required level of education reported by current workers, including green and non-green, in this occupation)										
Less then HS	HS Diploma/GED	Post-Secondary Certificate	Some College Courses	Associate's Degree	Bachelor's Degree	Post-Baccalaureate Certificate	Master's Degree	Post-Master's Certificate	Professional Degree	Doctoral Degree
0.0%	0.0%	0.0%	0.0%	0.0%	68.2%	3.4%	20.2%	0.0%	0.0%	8.3%

% represents the proportion of all workers in the occupation who have attained that education level

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*

What green or other credentials might be expected? (Common certifications held by green workers in this occupation)
LEED Certification - Green Associate
OSHA - HAZWOPER Certification
Professional Engineer
Professional Geologist - American Institute of Professional Geologists

Source: Arizona LMI Green Jobs Survey, http://azstats.gov/

What experience levels are employers expecting? (Experience reported by current workers, including green and non-green, in this occupation)						
None	<6 Months	6 Months - 1 Year	1 - 2 Years	3 - 4 Years	5 - 10 Years	> 10 Years
6.7%	0.0%	2.7%	0.6%	4.7%	61.0%	24.2%

% represents the proportion of all workers in the occupation who have attained that experience level

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*

How much training will employers likely provide? (Training reported by current workers, including green and non-green, in this occupation)								
None	<1 Month	1 - 3	3 - 6	6 Months - 1 Year	1 - 2 Years	3 - 4 Years	5 - 10 Years	> 10 Years
31.6%	10.7%	5.9%	7.4%	23.0%	6.7%	8.7%	3.4%	2.6%

% represents the proportion of all workers in the occupation who have attained that training level

*Source: O*Net OnLine occupational database, http://www.onetonline.org/*