

ARIZONA GREEN OCCUPATIONAL PROFILES

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

August

2011

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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.

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:

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

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

What do these workers do?

Advise management on whether continued operation of equipment could be hazardous.

Assemble, install, test, and maintain electrical or electronic wiring, equipment, appliances, apparatus, and fixtures, using hand tools and power tools.

Connect wires to circuit breakers, transformers, or other components.

Construct and fabricate parts, using hand tools and specifications.

Diagnose malfunctioning systems, apparatus, and components, using test equipment and hand tools, to locate the cause of a breakdown and correct the problem.

Direct and train workers to install, maintain, or repair electrical wiring, equipment, and fixtures.

Fasten small metal or plastic boxes to walls to house electrical switches or outlets.

Inspect electrical systems, equipment, and components to identify hazards, defects, and the need for adjustment or repair, and to ensure compliance with codes.

Install ground leads and connect power cables to equipment, such as motors.

Maintain current electrician's license or identification card to meet governmental regulations.

Perform business management duties such as maintaining records and files, preparing reports and ordering supplies and equipment.

Perform physically demanding tasks, such as digging trenches to lay conduit and moving and lifting heavy objects.

Place conduit, pipes or tubing, inside designated partitions, walls, or other concealed areas, and pull insulated wires or cables through the conduit to complete circuits between boxes.

Plan layout and installation of electrical wiring, equipment and fixtures, based on job specifications and local codes.

Prepare sketches or follow blueprints to determine the location of wiring and equipment and to ensure conformance to building and safety codes.

Repair or replace wiring, equipment, and fixtures, using hand tools and power tools.

Test electrical systems and continuity of circuits in electrical wiring, equipment, and fixtures, using testing devices such as ohmmeters, voltmeters, and oscilloscopes, to ensure compatibility and safety of system.

Use a variety of tools and equipment such as power construction equipment, measuring devices, power tools, and testing equipment including oscilloscopes, ammeters, and test lamps.

Work from ladders, scaffolds, and roofs to install, maintain or repair electrical wiring, equipment, and fixtures.

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

How might this job be green?

Solar panel and solar electric system installation

Work on wastewater purification plants

Make electrical connections for awning and retractable screen installations; assist with installations

Use high efficiency lighting

Improve energy efficiency by updating inefficient lighting fixtures

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

What are the related occupations that offer jobs for these workers?

Electronic Drafters
Electronics Engineering Technicians
Computer, Automated Teller, and Office Machine Repairers
Avionics Technicians
Electrical and Electronics Repairers, Commercial and Industrial Equipment
Electrical and Electronic Equipment Assemblers
Model Makers, Metal and Plastic

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	130
Lake Havasu City-Kingman, AZ	120
Phoenix-Mesa-Scottsdale, AZ	6,000
Prescott, AZ	N/A
Tucson, AZ	1,390
Yuma, AZ	150
Rest of Arizona	560

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	10	7
Lake Havasu City-Kingman, AZ	6	0
Phoenix-Mesa-Scottsdale, AZ	226	13
Prescott, AZ	6	0
Tucson, AZ	42	4
Yuma, AZ	2	0
Rest of Arizona	34	3

*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?
Commercial and Institutional Building Construction
Nonresidential plumbing and HVAC contractors
Residential plumbing and HVAC contractors
Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance
Nonresidential electrical contractors
Water and Sewer Line and Related Structures Construction
Machine Shops
Power and Communication Line and Related Structures Construction
Industrial Building Construction
Land Subdivision
General Medical and Surgical Hospitals
Local government
Residential electrical contractors
Other Metal Container Manufacturing
Residential masonry contractors
Metal Can Manufacturing
Nonresidential masonry contractors
Other nonresidential building equipment contractors
Federal government, civilian, except postal service
Metal Tank (Heavy Gauge) Manufacturing

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	\$30,200	\$33,510	\$39,060	\$40,560	\$46,400	\$55,420
Lake Havasu City-Kingman, AZ	\$30,350	\$35,410	\$42,740	\$44,640	\$53,810	\$63,070
Phoenix-Mesa-Scottsdale, AZ	\$28,390	\$34,740	\$43,070	\$45,840	\$54,140	\$66,070
Prescott, AZ	\$27,140	\$29,850	\$34,800	\$40,620	\$51,760	\$57,900
Tucson, AZ	\$23,770	\$27,310	\$33,510	\$36,620	\$44,210	\$53,670
Yuma, AZ	\$24,370	\$30,790	\$38,290	\$40,140	\$45,880	\$61,080
Rest of Arizona	\$30,995	\$39,265	\$47,840	\$48,885	\$57,770	\$70,085

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
\$ 40,040	\$ 35,329

*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)**	
14,639	12,306	-2,333	+ 3,538	=	1,205

*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 than 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%	28.5%	47.5%	8.4%	15.4%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%

% 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)
APS Qualified Solar Installer
Contractor License
Contractor License - Electrical
Journeyman - Electrician
NABCEP - PV Installer Certification
OSHA - HAZWOPER Certification

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
4.3%	0.0%	0.0%	15.1%	30.1%	50.3%	0.2%

% 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
19.6%	2.6%	7.4%	11.9%	5.6%	0.2%	20.9%	31.8%	0.0%

% 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/>*