

# ARIZONA GREEN OCCUPATIONAL PROFILES

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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:

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering, and mathematical analysis.

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

### What do these workers do?

Advise customer about, or perform, maintenance of software system.

Analyze information to determine, recommend and plan installation of a new system or modification of an existing system.

Confer with data processing and project managers to obtain information on limitations and capabilities for data processing projects.

Consult with customers or other departments on project status, proposals and technical issues such as software system design and maintenance.

Consult with engineering staff to evaluate interface between hardware and software, develop specifications and performance requirements and resolve customer problems.

Coordinate installation of software system.

Design and develop software systems, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.

Develop and direct software system testing and validation procedures.

Direct software programming and development of documentation.

Modify existing software to correct errors, to adapt it to new hardware or to upgrade interfaces and improve performance.

Prepare reports and correspondence concerning project specifications, activities and status.

Store, retrieve, and manipulate data for analysis of system capabilities and requirements.

Train users to use new or modified equipment.

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

### How might this job be green?

N/A

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

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

Computer Support Specialists

Mathematical Technicians

Electronic Drafters

Aerospace Engineering and Operations Technicians

Computer Science Teachers, Postsecondary

Computer, Automated Teller, and Office Machine Repairers

Electrical and Electronics Repairers, Commercial and Industrial Equipment

Numerical Tool and Process Control Programmers

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.

<b>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.)</b>	
<b>Area</b>	<b>Employment Total (May 2010)</b>
Flagstaff, AZ	N/A
Lake Havasu City-Kingman, AZ	N/A
Phoenix-Mesa-Scottsdale, AZ	N/A
Prescott, AZ	N/A
Tucson, AZ	N/A
Yuma, AZ	N/A
Rest of Arizona	N/A

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

<b>How many green jobs were advertised as available recently? (Based on online job advertisements, April 1 - June 30, 2011)</b>		
<b>MSA</b>	<b>All Job Postings</b>	<b>Green* Job Postings</b>
Flagstaff, AZ	1	1
Lake Havasu City-Kingman, AZ	0	0
Phoenix-Mesa-Scottsdale, AZ	888	33
Prescott, AZ	1	0
Tucson, AZ	74	3
Yuma, AZ	3	0
Rest of Arizona	65	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?
Computer Systems Design Services
Custom Computer Programming Services
Guided Missile and Space Vehicle Manufacturing
Software Publishers
Aircraft Engine and Engine Parts Manufacturing
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
Engineering Services
Aircraft Manufacturing
Other Computer Related Services
Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
Semiconductor and Related Device Manufacturing
Data Processing, Hosting, and Related Services
Wired Telecommunications Carriers
Other Aircraft Parts and Auxiliary Equipment Manufacturing
Corporate, Subsidiary, and Regional Managing Offices
Administrative Management and General Management Consulting Services
Professional Employer Organizations
State government
Computer and Computer Peripheral Equipment and Software Merchant Wholesalers
Computer Facilities Management Services

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						N/A
Lake Havasu City-Kingman, AZ						N/A
Phoenix-Mesa-Scottsdale, AZ						N/A
Prescott, AZ						N/A
Tucson, AZ						N/A
Yuma, AZ						N/A
Rest of Arizona						N/A

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
\$ 83,200	\$ 77,500

\*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)**
6,942	7,941	999	+ 584	= 1,583

\*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%	9.7%	5.5%	4.8%	2.8%	54.0%	12.2%	10.7%	0.0%	0.0%	0.3%

% 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)

N/A

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
0.0%	0.0%	15.3%	10.9%	37.2%	27.3%	9.3%

% 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
27.8%	10.9%	9.9%	9.4%	23.8%	17.9%	0.0%	0.3%	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/>