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GREEN OCCUPATIONS: A LOOK AT WHAT'S OUT THERE

This chapter provides a sampling of the types of green careers in Green Increased Demand, Green Enhanced Skills, and Green New and Emerging occupations. Bright Outlook occupations are noted. This sampling is provided so that you can get a feel for the variations in skills needed, educational requirements, workplaces, pay scales, and demand. Two occupations in each category that show the most job growth right now (or have a Bright Outlook) are profiled.

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GLOSSARY

Chapter 1, "Introduction to the Guide," describes the most common trait of green jobs as contributing to preserving or restoring the environment. It also describes the greening of occupations and three categories of green occupations: "Green Increased Demand Occupations," "Green Enhanced Skills Occupations," and "Green New and Emerging Occupations." This categorization of green occupations was developed by the National Center for O*NET Development for the U.S. Department of Labor's Employment and Training Administration.²⁸

The National Center for O*NET Development also designated some green occupations as "Bright Outlook" occupations. Bright Outlook occupations are expected to grow at a rapid rate from 2008-2018; expected to have 100,000 or more job openings from 2008-2018; or are new and emerging occupations in high-growth industries.²⁹

There are other green jobs that may align with your interests and skills or offer better prospects where you live, or want to live, since not all green jobs exist in every area of the country. To learn more about finding a green job, the education needed for your chosen career, or about real women succeeding in their green careers, please see the following chapters of the guide: Chapter 4, "Educating Yourself for a Green Career;" Chapter 5, "Finding Your Green Job;" and Chapter 7, "Women Succeeding in Green Jobs."

LOOKING FOR MORE INFORMATION ON GREEN OCCUPATIONS?

There are many local, state, and national resources available to you. Check out these resources either online or in person:

- 1. Career advisors at community colleges or universities are a useful resource for obtaining specific career information, conducting interest assessments, and/or coordinating job shadowing opportunities.
- **2. Industry association** websites provide an overview of an industry as well as statistics, job openings, and publications relevant to the field.
- **3.** Labor unions across a broad range of industries are working to train members for green jobs. If you are a union member, ask what green training opportunities are available to you.
- 4. <u>One-Stop Career Centers</u> offer career exploration assistance. Depending on your circumstances, they can help you with creating a resume, planning your job search, assessing your skills, and/or by connecting you with training.
- 5. People working in green industries can give you a firsthand account of what it's like to work in a particular green job. Contact your training provider or college, or a green company in your area, to see if you can arrange an informational meeting.
- **6. Research reports** on particular industries or occupations and employment trends can be found by doing an online search or by visiting your local library.
- 7. **Training providers** in your area will be able to provide you with detailed information about green training programs and the types of jobs available to you, along with the training they provide.

A SELECTION OF GREEN OCCUPATION PROFILES

Renewable Energy

WIND TURBINE SERVICE TECHNICIAN

Within the renewable energy sector, wind turbine service technician is a Green New and Emerging occupation as well as a Bright Outlook occupation.

Job Duties. Wind turbine service technicians perform regular maintenance and repairs of wind turbines. Wind turbine service technicians may also be responsible for administration of the site, including making sure there is a proper inventory of parts available for needed repairs and ordering spare parts as needed.³⁰

Skills and Credentials. There is no set path to becoming a wind turbine service technician. Currently, many technicians learn the trade on the job or through apprenticeship programs. However, it is helpful to have mechanical skills from experience in a related industry. As more vocational training programs are developed and training is standardized, technicians will be expected to complete a certificate program at a community college or technical school or earn a degree in wind turbine maintenance.³¹

Working Conditions. Technicians must be comfortable with heights, able to work in small spaces, and physically fit. Technicians may be expected to climb several towers wearing load-bearing harnesses during the course of a typical workday. In addition, technicians work with handheld power tools and electrical measuring instruments. Many wind farms are located away from populated areas, so technicians must be prepared to travel frequently or to live in remote locations for extended periods.³²

Wages. BLS does not currently have earnings data for wind turbine service technicians. Data should be available in several years. According to industry sources, however, wind turbine service technicians usually have starting salaries between \$35,000 and \$40,000.³³

Career Opportunities. As a technician gains more experience, she may become responsible for the maintenance of more wind turbines or take on additional administrative responsibilities.

Projected Growth. The overall demand for the occupational category of Installation, Maintenance, and Repair Workers, All Other (which includes wind turbine service technicians) is expected to grow by nine percent between 2008 and 2018.³⁴ Although there are <u>wind energy</u> jobs in almost every state, wind farms are frequently located in the Midwest, Southwest, and Northeast regions of the United States.³⁵

Solar Photovoltaic Installer

The solar photovoltaic (PV) installer, also called a solar panel installer, is another Green New and Emerging occupation in the renewable energy sector. This Bright Outlook occupation has experienced significant growth over the past several years. It requires more specialized training and experience than the wind turbine service technician.

Job Duties. Solar photovoltaic installers assemble, install, or maintain solar panel systems on roofs or other structures. Duties may also include measuring, cutting, assembling, and bolting structural framing and solar modules. In addition, installers may perform minor electrical work such as current checks.

Skills and Credentials. Most solar installers have at least a high school diploma and experience in mechanical or electrical installation.³⁶ Solar installation certification programs can be completed through employers, vendors, or independent agencies. Workers with construction backgrounds are often well-suited for the work, and roofing experience is particularly valuable.³⁷ Solar photovoltaic installers need mechanical skills and must be able to work with the power tools and hand tools used to construct and fasten panels.³⁸ Electrical knowledge and math skills are important, as are good problem-solving abilities. Attention to detail is critical,

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because the installation process requires workers to closely follow diagrams and instructions. Installers must also be capable of heavy lifting, as a typical solar panel weighs between 30 and 40 pounds.³⁹

Working Conditions. Installation work is mostly done on high spaces, such as roofs and sides of buildings. Therefore, installers must be comfortable with heights and able to work on uneven surfaces. In addition, installers must be familiar with the proper use of eye, ear, and fall protection as well as electrical safety.

Wages. According to BLS, the median annual wage for the occupational category of Construction and Related Workers, All Other (which includes solar photovoltaic installers) was \$33,980 in 2009.⁴⁰

Career Opportunities. Some workers concentrate primarily on installing solar panels. Other workers may also perform other tasks, such as sales, planning, or wiring. As an installer gains experience, she may advance to become a lead installer, system designer, or another related position.

Projected Growth. The overall demand for Construction and Related Workers, All Other is expected to grow by 11 percent between 2008 and 2018.⁴¹ Of the estimated 70,000 solar photovoltaic installers in the country, half are employed in the state of California.⁴² New Jersey, Florida, and Colorado are also top states for solar energy production.⁴³

Kelley Benyo, a master electrician in Minnesota, said that her career path evolved over time. "I initially went into the orthopedic medicine field after high school. I ... developed a severe allergy where I couldn't work in the operating room. ... I had bought my own home and did all of the renovations on my own. I got interested in doing the electrical work. I got my degree in electrical installation and maintenance, and then I joined a union apprenticeship program. Kelley now has 13 years of experience, was the first woman in her state to become a North American Board of Certified Energy Practitioners certified solar PV installer, owns her own company, EcoVision Electric, and teaches courses in photovoltaic solar design, installation, and maintenance for the Minneapolis Electrical Joint Apprenticeship Training Committee and St. Paul College.

Environmental Protection

Recycling Coordinator

Within the environmental protection sector, recycling coordinator is a Green New and Emerging occupation as well as a Bright Outlook occupation.

Job Duties. A recycling coordinator's main responsibility is to supervise curbside and drop-off recycling programs for municipal governments or private firms. She may also be responsible for educating the general public or company employees on the importance of recycling.

Skills and Credentials. The education required for this occupation typically ranges from completion of high school to some postsecondary education. For example, an associate degree from a community college or technical school in public administration, environmental science, or a related field is appropriate. Recycling coordinators must be able to interpret and follow technical procedures and governmental regulations; have knowledge of recycling and <u>source reduction practices</u>; and have good communication skills, as they may frequently interact with the public.

Working Conditions. Recycling coordinators spend most of their time in offices. However, they may occasionally be required to work outdoors.

Wages. BLS reports that the median annual wage for the occupational category of First-Line Supervisors/ Managers of Helpers, Laborers, and Material Movers, Hand (which includes recycling coordinators) was \$42,940 in 2009.⁴⁴

Career Opportunities. Opportunities for advancement will vary by educational level and employer. However, after gaining some experience, a recycling coordinator may move to a specialist position, taking on additional responsibilities such as contract, grant, and budget management.

Projected Growth. The overall demand for First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand is expected to grow by four percent between 2008 and 2018.⁴⁵

ENVIRONMENTAL SCIENTIST

The environmental scientist occupation is a Green Increased Demand and a Bright Outlook occupation. Compared to the recycling coordinator, this occupation requires more education and experience.

Job Duties. Environmental scientists are trained in the natural sciences and use their training to protect the environment by identifying problems and finding solutions that minimize environmental hazards. For example, they analyze measurements or observations of air, food, water, and soil to determine ways to clean and preserve the environment.

Skills and Credentials. A bachelor's degree in any life or physical science is generally sufficient for most entry-level positions.⁴⁶ Many scientists earn degrees in biology, chemistry, physics, or the geosciences. Some employers may require a master's degree in environmental science or a related natural science. Scientists also need advanced computer skills, including experience with computer modeling, data analysis and integration, digital mapping, remote sensing, and Geographic Information Systems (GIS) technology.⁴⁷

Working Conditions. Entry-level environmental scientists spend a significant amount of time in the field. More experienced scientists generally spend more time in the office or laboratory. They may work in warm or cold climates, and in all kinds of weather.

Wages. According to BLS, the median annual wage for Environmental Scientists and Specialists, Including Health was \$61,010 in 2009.⁴⁸

Career Opportunities. Many environmental scientists begin their careers as field analysts, research assistants, or technicians in laboratories or offices. As they gain experience, scientists are given more difficult assignments and independence. There are many opportunities for advancement, including promotions to project leader, program manager, or another management or research position.

Projected Growth. The demand for Environmental Scientists and Specialists, Including Health is expected to grow by 28 percent between 2008 and 2018.⁴⁹ According to BLS, in 2009, the most environmental protection workers were employed in California, followed by Texas, Florida, Wisconsin, and Minnesota (depending on the specific professions included).⁵⁰

GREEN BUILDING AND ENERGY EFFICIENCY

WEATHERIZATION INSTALLER AND TECHNICIAN

Within the energy efficiency sector, weatherization installer and technician is a Green New and Emerging as well as a Bright Outlook occupation.

Job Duties. These installers and technicians perform a variety of activities to make homes and buildings more <u>energy-efficient</u>. Duties may include repairing windows; insulating ducts; and performing heating, ventilating, and air-conditioning (HVAC) work. In addition, some installers and technicians may perform energy audits and educate clients on ways to conserve energy in their homes or businesses.

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Skills and Credentials. Weatherization installers and technicians are typically required to have a high school diploma and complete a <u>weatherization</u> training program through a community college, trade school program, or <u>apprenticeship</u> program. Knowledge of basic general construction trade and maintenance principles and practices is a must. Skills related to air sealing, duct-sealing, insulation, energy-efficient lighting, and water improvements are also important.⁵¹

Working Conditions. These positions require heavy lifting; working in small, cramped spaces; or work in dirty or dusty areas. Installers and technicians often use power tools or hand tools and must follow proper safety procedures.

Wages. The median annual wage for the occupational category of Construction and Related Workers, All Other (which includes weatherization installers) was \$33,980 in 2009.⁵²

Career Opportunities. A common career path of an installer and technician is progression to a supervisory role, such as a crew chief, and then to an energy auditing position. Auditors may work in weatherization agencies or independently to conduct energy rating audits based on established standards.

Projected Growth. The overall demand for Construction and Related Workers, All Other is expected to grow by 11 percent between 2008 and 2018.⁵³

LANDSCAPE ARCHITECT

Within the <u>green building</u> sector, landscape architect is a Green Enhanced Skills and Bright Outlook occupation. Unlike weatherization installers and technicians, landscape architects are generally required to complete a bachelor's or master's degree program.

Job Duties. Landscape architects plan and design land areas for projects such as parks or other recreational facilities, airports, highways, hospitals, schools, land subdivisions, and various other commercial, industrial, and residential sites.

Skills and Credentials. A bachelor's or master's degree in landscape architecture is usually necessary for an entry-level position.⁵⁴ In addition, most states require landscape architects to be <u>licensed</u>. Creative vision, artistic talent, and computer skills are essential for landscape architects. Computer-aided design (CAD) is a tool used frequently in the occupation, as is Geographic Information Systems (GIS) technology.⁵⁵ In addition, good communication skills are necessary, as landscape architects must present their ideas to clients and other professionals.

Working Conditions. Landscape architects spend most of their time in offices creating plans and designs, preparing models and cost estimates, doing research, or attending meetings with clients.⁵⁶ However, a significant portion of time may be spent at the project site.

Wages. The median annual wage for a landscape architect was \$60,560 in 2009.57

Career Opportunities. Landscape architects can progress to project management positions as they become more experienced. Eventually, they may become associates or partners of a firm. Opportunities also exist for landscape architects to become construction supervisors, land or environmental planners, or landscape consultants.

Projected Growth. BLS estimates that employment of landscape architects is expected to increase by 20 percent from 2008 to 2018.⁵⁸ Employment of landscape architects is concentrated in urban and suburban areas throughout the country.⁵⁹ About 60 percent of all university landscape architect graduates are women.⁶⁰

DOING YOUR OWN RESEARCH

The jobs described in this chapter are a sampling of the many green jobs available in the various green economy sectors. Green jobs are available to workers with different interests, education levels, and skill sets. Researching the types of green jobs and their training requirements can help you identify those occupations that match your skills and interests. You can find information on green occupations by looking online or at printed materials, through conversations with others working in these occupations, and/or by talking with a career advisor about how your current work and education history could translate into a new occupation. Chapter 9, "Planning Your Green Career," has more information on how to begin preparing for a green job.

You can find the occupations in this chapter and other green occupations on O*NET online by following the steps in "Using O*NET" in Chapter 9.

ADDITIONAL RESOURCES

You may find these resources helpful in planning for a green career. Web links can change, so you may need to do Internet searches to find the latest information.

GREEN CAREERS

GOVERNMENT RESOURCES

• Occupational Information Network (O*NET). O*NET is a comprehensive, user-friendly career exploration tool created for DOL's Employment and Training Administration with a special section on the green economy. http://onetcenter.org/green.html

Non-Government Resources

- Green for All. Green for All provides a description of green job opportunities, links to green jobs listings, and resources for green job training. http://www.greenforall.org/resources/green-collar-jobs-resources
- Oregon Tradeswomen, Inc. (OTI). OTI provides short informational videos about lineworkers, plumbers and steamfitters, electricians, and ironworkers at http://www.tradeswomen.net/?page_id=35, and on green builders at http://www.tradeswomen.net/greenbuilders.html.
- University of Michigan, Multicultural Environmental Leadership Development Initiative (MELDI). MELDI provides a searchable database of salary ranges, desired skills, and experience associated with specific job titles in the environmental field. http://meldi.snre.umich.edu/job_description
- Women Employed (WE). WE's Career Coach resource is an easy-to-use online tool that helps you learn about good careers, set a career goal, and make plans to reach it. http://www.womenemployed.org

TECHNICAL SKILLS

GOVERNMENT RESOURCES

• mySkills myFuture. mySkills myFuture is an electronic tool developed by the U.S. Department of Labor (DOL), Employment and Training Administration (ETA), that enables previously-employed job seekers to match their occupational skills and experiences with the skills needed in other occupations. http://www.myskillsmyfuture.org

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• CareerOneStop. CareerOneStop, created for DOL's Employment and Training Administration (ETA), provides an array of online job seeker tools (http://www.careeronestop.org) and allows you to search for a One-Stop Career Center in your area (http://www.servicelocator.org).

This list is not exhaustive and inclusion on this list does not represent an endorsement of any institution or program. While all efforts are made to ensure that hyperlinks are working and the information contained at the referenced websites is useful, the authors do not endorse, take responsibility for, or exercise control over the websites or organizations, nor do they vouch for the accuracy or accessibility of the information contained on these sites. The authors also cannot authorize the use of copyrighted materials contained in these sites. Users must request such authorization from the sponsor of the website.

End Notes

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