Renewable Energy Technician

Snapshot

Career Cluster: Architecture & Construction; Environment & Conservation; Natural Resources Development
Interests: Hydroelectric, solar, and geothermal energy; environmental science; maintenance and repair
Earnings (Yearly Average): $47,741
Employment & Outlook: Faster Than Average Growth Expected

OVERVIEW

Sphere of Work

Renewable energy technicians design, install, manage, and care for the mechanical systems used in the generation of wind, solar, geothermal, biological, and hydroelectric energy. They inspect and maintain solar panels, wind turbines, power generators and other equipment, most often at electric power plants. If these technologies fail, energy technicians may recommend shutting down affected equipment until repairs can be completed. Many renewable

energy technicians work at multiple sites, providing assessment, maintenance, and repair services as requested by the site managers or owners. Some renewable energy technicians design, install, and maintain renewable energy technologies at private residences, educational institutions, or businesses.

Work Environment

Renewable energy technicians work at energy-generating facilities, for example, hydroelectric dams, wind farms, solar farms, geothermal energy plants, and bioenergy installations. Many of these facilities, particularly wind and solar farms and hydroelectric dams, may be located in remote locations, so renewable energy technicians must live close by or be willing to spend a significant amount of time traveling. While on site, much of the work is done outdoors—in varying weather conditions. There are physical risks associated with some job duties, as certain technicians frequently climb to the top of very tall wind turbines or other tall structures to perform their work. Technicians may also be at risk of exposure to extreme heat or electrocution when working close to renewable energy collectors or generators.

Profile

Working Conditions: Work both Indoors and Outdoors
Physical Strength: Medium Work
Education Needs: Junior/Technical/Community College, Bachelor's Degree
Licensure/Certification: Recommended
Physical Abilities Not Required: N/A
Opportunities For Experience: Apprenticeship, Part-Time Work
Holland Interest Score*: RCI

* See Appendix A

Occupation Interest

Renewable energy technicians provide expertise and services to an exciting new industry that has grown significantly in a relatively short time. The work they do helps to lessen the environmental impact of electric power by reducing society's use of fossil fuels. A young field, renewable energy requires a range of skills, with some technicians dealing directly with electrical systems, others skilled in system installation, and still others participating in system design. Successful renewable energy technicians are well aware of the dynamic nature of the industry and keep abreast, as well as contribute to, the advances in the field. Renewable energy technicians spend much of their time working outdoors, and should be able to climb, kneel, carry tools and equipment, and walk long distances. Working in a relatively new

technical field may appeal to individuals interested in being at the forefront of technological development.

A Day in the Life—Duties and Responsibilities

TRenewable energy technicians' daily responsibilities vary according to their particular area of expertise. For example, wind energy technicians work at wind farms, frequently climbing hundreds of feet into the air to work inside a nacelle (the housing at the center of a wind turbine) where they clean and lubricate bearings, shafts, and gears. Geothermal energy technicians also work outdoors, monitoring energy and heat outputs, replacing and installing new piping systems, and testing the efficiency of residential and commercial geothermal heat pumps. Hydroelectric power technicians spend time inside hydroelectric power plants to monitor generators, flow tunnels, and computers that track the efficiency of turbines.

When beginning a project, renewable energy technicians may assess a site to determine the proper systems and methods for the installation of equipment used to collect solar energy, wind power, bioenergy, hydroelectricity, or geothermal energy. After installing the equipment, they prepare it for connection to the electric power grid by priming, flushing, purging, or performing other practices. According to schedule and at the request of the energy company or the facility director, renewable energy technicians also travel periodically to the dam, farm, or other facility to inspect equipment, assess productivity, diagnose any malfunctions, and make repairs. Based on information about the output and efficiency of the facility, technicians will make recommendations for upgrades or modifications.

Duties and Responsibilities

- **Designing, installing, operating and maintaining systems that use renewable energy**
- **Recommending energy efficiency and alternative energy solutions**
- **Researching the latest information concerning renewable energy advances**
- **Consulting with and supervising other technicians and installers**
- **Working with individual clients and government agencies**

OCCUPATION SPECIALTIES

Wind Turbine Service Technicians

Wind Turbine Service Technicians inspect, adjust and maintain wind turbines that harness wind energy.

Solar Energy System Installers & Technicians

Solar Energy System Installers & Technicians build, install and maintain systems on roofs and other structures that harness solar energy. They also install and repair systems that collect, store and circulate solar-heated water.

Hydropower Energy Technicians

Hydropower Energy Technicians maintain hydropower plants that convert water to energy.

Geothermal Energy Technicians

Geothermal Energy Technicians maintain geothermal power plants that convert energy from the earth's core.

Bioenergy Technicians

Bioenergy Technicians maintain bioenergy power plants that convert energy from biomass, such as wood, crops, plants, waste materials and alcohol fuels.

Fuel Cell Technicians

Fuel Cell Technicians research and perform the assembly and testing of fuel cells and also install and maintain existing fuel cells.

WORK ENVIRONMENT

Relevant Skills and Abilities

Communication Skills

- Speaking effectively
- Writing concisely

Interpersonal/Social Skills

- Being able to work independently
- Working as a member of a team

Organization & Management Skills

- Paying attention to and handling details
- Coordinating tasks
- Making decisions
- Performing duties which change frequently

Research & Planning Skills

- Analyzing information
- Developing evaluation strategies
- Using logical reasoning

Technical Skills

- Understanding which technology is appropriate for a task
- Applying the technology to a task
- Maintaining and repairing technology
- Working with your hands
- Working with machines, tools or other objects

Physical Environment

Renewable energy technicians work at renewable energy facilities, such as wind and solar farms, hydroelectric dams, and bioenergy and geothermal energy processing plants. Many of these facilities are located in remote, open areas. Because the facilities process electricity, there may be a risk of electrocution when working on technical equipment. There is also a risk of other physical injuries at different types of electric power plants and wind farms.

Human Environment

Depending on the sub-field in which they work, renewable energy technicians work with a number different people, including environmental engineers, environmental scientists, business executives, construction personnel, utility workers, and energy auditors.

Technological Environment

Nursery workers use machinery and eIn addition to the hand-held tools used to install renewable energy equipment and systems, technicians use and work in close proximity to a wide range of energy-related technologies. Among these devices are portable data input terminals, digital refractometers, temperature gauges, water pressure

gauges, nacelles, and photovoltaic cells. Technicians also use computer software, including input/output tracking software, databases, and analytical software.

EDUCATION, TRAINING, AND ADVANCEMENT

High School/Secondary

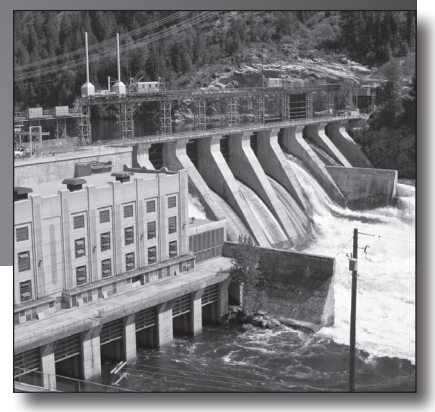
High school students should study algebra, geometry, and other mathematics courses. Natural sciences such as chemistry, physics, and environmental studies are equally important. Computer science, drafting, and industrial arts courses (such as welding, building trades, carpentry, and electronics) are also useful preparation for this field.

Suggested High School Subjects

- Algebra
- Applied Math
- Blueprint Reading
- Building Trades & Carpentry
- Chemistry
- College Preparatory
- Computer Science
- Drafting
- Electricity & Electronics
- English
- Geometry
- Heating/Air Cond./Refrigeration
- Machining Technology
- Mathematics
- Mechanical Drawing
- Metals Technology
- Physics
- Science
- Shop Math
- Shop Mechanics
- Welding

Famous First

The first hydroelectric power plant to use a storage battery was the Hartford Electric Light Company, Hartford, Conn., in 1896. The storage battery made it possible to supply the company's peak-load requirements from water power that would otherwise have gone to waste during the periods of relatively small demand.



College/Postsecondary

Although employers value practical experience in this occupation, many employers prefer candidates to have an associate's or bachelor's degree. Renewable energy technicians can increase their competitiveness as job candidates by obtaining technical certificates and degrees in related fields, such as hydroelectricity maintenance and wind turbine maintenance. Such programs are increasingly becoming available at two-year community and technical colleges.

Related College Majors

- Electromechanical Technology
- Heating, Air Conditioning & Refrigeration Technology
- Solar Technology

Adult Job Seekers

Some renewable energy technician jobs may be found through technical and community college placement offices. Candidates may also apply directly to companies who advertise in print or online. Individuals with limited experience may join renewable energy firms as interns, or obtain part-time or summer jobs as a means of entry into the field.

Professional Certification and Licensure

There is no required certification for renewable energy technicians. Voluntary certification programs in specialized fields, such as wind turbine maintenance and geothermal energy maintenance, are

increasingly available through professional trade associations. Such certification can bolster a candidate's credentials, especially in light of the fact that the renewable energy field is becoming more competitive. As with any voluntary endeavor, candidates should consult credible professional associations within the field and follow professional debate as to the relevancy and value of any certification program.

Additional Requirements

Renewable energy technicians should be detail-oriented and possess the ability to analyze complex systems and problems, as well as excellent mechanical skills. They must be willing to travel, sometimes for long periods of time. Many renewable energy technician positions spend a great deal of time working outdoors and often need to climb tall structures or perform heavy lifting activities. To work effectively with a team of colleagues from different fields, they should have strong communication and people skills.

EARNINGS AND ADVANCEMENT

Median annual earnings of renewable energy technicians were $49,173 in 2012.

Renewable energy technicians may receive paid vacations, holidays, and sick days; life and health insurance and retirement benefits. These are usually paid by the employer.

EMPLOYMENT AND OUTLOOK

Employment of renewable energy technicians is expected to grow much faster than the average for all occupations through the year 2022, which means employment is projected to increase 20 percent or more. Energy and its relationship to sustaining the environment is a rapidly growing field that will continue to create demand for new jobs for many years to come.

Related Occupations

- Energy Auditor
- Energy Conservation & Use Technician
- Energy Engineer
- Heating and Cooling Technician
- Solar Energy System Installer
- Wind Energy Engineer

SELECTED SCHOOLS

Many technical and community colleges offer programs in energy systems installation and repair, often with a concentration in renewable energy. Interested students are advised to consult with their school guidance counselor or to research area postsecondary schools and training programs. For those interested in pursuing a bachelor's degree, a state land-grant college or technical institute is probably the best place to start.

MORE INFORMATION

American Council on Renewable Energy
1600 K Street NW, Suite 700
Washington, DC 20006
202.393.0001
www.acore.org

American Solar Energy Society
4760 Walnut Street, Suite 106
Boulder, CO 80301
303.443.3130
www.ases.org

American Wind Energy Association
1501 M Street, NW, Suite 1000
Washington, DC 20005
202.383.2500
www.awea.org

Biomass Power Association
100 Middle Street
P.O. Box 9729
Portland, ME 04104-9729
703.889.8504
www.usabiomass.org

Energy Efficiency & Renewable Energy Network
Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585
800.342.5363
www.eere.energy.gov

Geothermal Resources Council
P.O. Box 1350
Davis, CA 95617
530.758.2360
www.geothermal.org

National Hydropower Association
25 Massachusetts Avenue, NW
Suite 450
Washington, DC 20001
202.682.1700
www.hydro.org

Renewable Fuels Association
425 Third Street, SW, Suite 1150
Washington, DC 20024
202.289.3835
www.ethanolrfa.org

Solar Energy Industries Association (SEIA)
575 7th Street, NW, Suite 400
Washington, DC 20004
202.682.0556
www.seia.org

Windustry
2105 First Avenue South
Minneapolis, MN 55404
800.946.3640
www.windustry.org

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