CAREERS IN ENERGY

INTRODUCTION

Nearly everything we do requires energy. Because our need for energy is constantly growing, there are many great career opportunities in the energy sector. Solar and wind jobs are the fastest-growing jobs in the country, with demand increasing at a rate 12 times faster than the rest of the economy. In addition, according to *Forbes Magazine*, 45% of all workers in clean energy production—including electricians, installers, repairers, and power plant operators—only have a high school diploma and earn more than workers in other industries with similar education. The energy sector is a fast-growing field and needs people with a variety of skill sets, training, and expertise. If you are considering a career in energy, this booklet is your guide.

For salary information and estimates go to the U.S. Department of Labor, Employment & Training Administration O*Net database: www.onetonline.org

ENERGY AUDITOR

Energy auditors visit homes and business to help people figure out if they are wasting energy. They study the way we use heating, cooling, gas, and electricity and recommend ways to use energy more efficiently. To detect heat or air leaks, energy auditors often conduct tests using blower doors or thermal infrared cameras. Once they discover where the inefficiencies are, they identify solutions and make suggestions on how to implement them.

CAREER REQUIREMENTS

- A high school diploma

Preferred qualifications

- An associate's or bachelor's degree in building science or construction

Certification/Licensing

- Certifications are offered by The Building Performance Institute (www.BPI.org) and the Residential Energy Services Network (www.resnet.us)

WEATHERIZATION WORKER

Weatherization workers work on projects for the Weatherization Assistance Program, a federal government initiative designed to help low-income clients save money on their energy bills. Weatherization workers inspect homes to see if they are leaking air or heat. If they find leaks, they recommend the best ways to seal them and provide cost estimates. Fixing leaks can involve repairing or replacing windows, sealing air ducts, filling in insulation, applying weather stripping, or servicing heating ventilation and air conditioning (HVAC) systems.

CAREER REQUIREMENTS

- A high school diploma or equivalent

Preferred qualifications

- An associate's degree in some aspect of the building trade or a certificate from a training program is recommended.
- Weatherization coursework is helpful and is available both at Weatherization Training Centers (https://nascsp.org/wap/wap-tac/weatherization-training-centers/) and at some community colleges and vocational schools.
- With relevant work experience, you can get on-the-job training, which can last 6 months to a year.

Certification/Licensing

- Certification is not required, but a Home Energy Professional certificate from The Building Performance Institute is recommended.

PLANT OPERATOR

Plant operators monitor and run the equipment that generates power in coal, gas, nuclear, or renewable energy power plants: boilers, turbines, generators, reactors, and other power-producing equipment. They test and inspect the systems to make sure they are running properly, check gauge readings, and adjust controls to regulate the power flow. They may need to repair equipment as well.

CAREER REQUIREMENTS

- A completed internship at a power plant

Preferred qualifications

- An undergraduate degree in power plant technology or vocational training certificate is recommended.

Certification/Licensing

- Nuclear power plant operators need a license from the U.S. Nuclear Regulatory Commission.
- Some employers require operators to pass the Plant Operator (POSS) and Power Plant Maintenance (MASS) exams designed by the Edison Electric Institute (www.eei.org). After passing the exams, get on-the-job training at a power plant, which can last several years.

LINE WORKERS

Line workers install and repair overhead and underground wires and cables that transmit electricity from power plants to homes and buildings. They mount equipment on poles; inspect and test power lines and equipment; and detect faulty switches, fuses, and wires. Line workers often put together electrical components or systems and may need to operate cranes or other moving equipment. They need an understanding of electrical equipment and electrical currents.

CAREER REQUIREMENTS

- A high school diploma or GED
- Vocational training in electronics or electrical repair
- An apprenticeship involving hands-on training under a senior line worker
- A commercial driver's license to drive utility trucks may be required.

Certification/Licensing

- Some employers require an electrical license; requirements vary from state to state.

UTILITY TECHNICIAN

Utility technicians monitor and regulate energy produced by a gas or electrical utility company. The work involves installing, operating, and maintaining power equipment; measuring the energy flow and making sure it is working properly; and preventing power surges. It may include working on motors, belts, filters, fluids, wiring, electrical components, and plumbing. Utility technicians also repair machinery using hand or power tools. They are adept at repair and maintenance work and understand electronic equipment, computers, and schematics.

CAREER REQUIREMENTS

- A high school diploma or GED
- An associate's or bachelor's degree in power utility technology
- Experience maintaining and operating machinery

Certification/Licensing

- Licensing requirements vary by state; licenses may be required for more complex specialties.

SOLAR INSTALLER

Solar installers install, inspect, and maintain photovoltaic solar panels, which convert sunlight into electricity on homes, businesses, and on land. They plan solar-panel arrangements based on the customer's needs and the site, install the panels and supporting equipment, and connect it to the power grid. Solar installers must ensure the installation meets building codes and safety standards. They need to be good with their hands and comfortable using hand and power tools.

CAREER REQUIREMENTS

There are two routes to becoming a solar installer:

- A high school diploma and on-the-job training, which involves working with an experienced installer for up to a year; or
- Coursework on solar-panel installation from a community college or vocational school.

Certification/Licensing

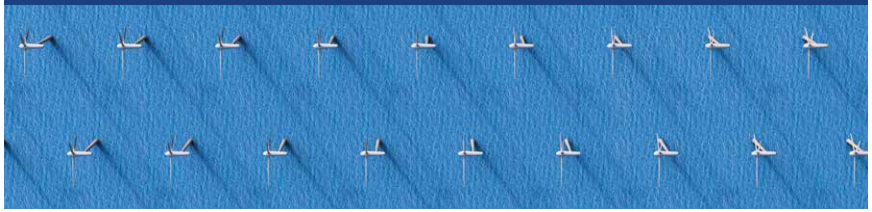
- Licensing requirements vary by state. The Interstate Renewable Energy Council (https://irecusa.org) has a map detailing solar licensing requirements.

WIND TECHNICIAN

Wind technicians install, operate, maintain, and repair wind turbines. They inspect the towers, collect data from turbines for analysis, test electrical parts and systems, and replace old components. Because most of the work is done in the nacelle, the housing that sits atop the turbine, wind technicians work in small spaces high off the ground.

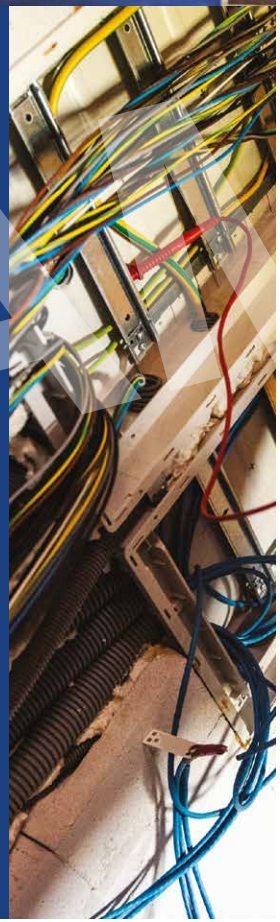
CAREER REQUIREMENTS

- A high school diploma or GED
- 2 years of technical training from a technical school or an associate's degree from a community college
- At least 12 months of on-the-job training, which can be done partially through an internship or an apprenticeship



ELECTRICIAN

Electricians install, maintain, and repair the wiring and equipment for electrical systems in homes and businesses. They need to understand blueprints and diagrams, use hand and power tools, and operate testing equipment to inspect for problems. Electricians must ensure that all work complies with the National Electric Code and building regulations.



CAREER REQUIREMENTS

- A high school diploma or GED
- A 4 to 5-year apprenticeship with a licensed electrician, which will include on-the-job training and classes. You can find apprenticeships through the National Electrical Contractors Association (www.necanet.org), the IBEW (www.ibew.org), or Independent Electrical Contractors (www.ieci.org).

Preferred Qualifications

- Trade school classes are recommended but not required.

Certification/Licensing

- Most states require a license, but licensing requirements vary; to become a licensed journeyman electrician, you must pass one or more exams.
- To become a master electrician, some states require certification. You also must complete an apprenticeship or get an electrical engineering degree, have several years of work experience, and pass a licensing exam.

PLUMBER

Plumbers install and repair pipelines that carry water and gas in buildings, and take away waste. They also install and fix toilets, sinks, bathtubs, and water heaters, and they may work with heating and cooling equipment. Plumbers sometimes work under dangerous conditions with welding, electrical equipment, and natural gas lines. They are integral to the installation of many types of HVAC and renewable technologies, such as solar hot water and geothermal heating.

CAREER REQUIREMENTS

- A high school diploma or GED
- Vocational training at a trade school or community college
- A 4 to 5-year apprenticeship program working under an experienced journeyman plumber, which will include on-the-job training and classes.

Certification/Licensing

- To work as a journeyman plumber, a state licensing exam is required.
- To become a master plumber, you must work as a journeyman plumber for 2 years and take another exam.
- Most states have continuing education requirements to renew licenses.

HVAC TECHNICIAN

HVAC technicians install and repair heating ventilation and air-conditioning (HVAC) and refrigeration systems in homes and buildings. They often work with contractors, installing systems in new buildings or homes. The work includes repairing pipes or defective parts, adjusting equipment, and working with electrical components. HVAC technicians may be called at off hours if systems suddenly break down. Because they can be exposed to contaminants like gas or odors, they need to wear protective gear.

CAREER REQUIREMENTS

- A high school diploma or GED in order to take the necessary HVAC courses at a vocational college or trade school
- An accredited HVAC training program: 6-month HVAC training programs provide a HVAC technician certificate; 2-year HVAC training programs lead to an associate's degree and certification
- Complete an HVAC apprenticeship, which lasts 3 to 5 years

Certification/Licensing

- Many states require HVAC technicians to be licensed.
- HVAC technicians working with refrigerants must be certified by an EPA-approved organization and pass a test.

ARCHITECT

Architects design, plan, and oversee the construction or remodeling of homes and buildings. They deal with function, aesthetic, safety, and legal issues. Architects use computer-aided design to create a blueprint and then make sure the structure is built as planned. Sustainable or green architects use sustainable building materials and design buildings that conserve water and energy and manage waste efficiently.

CAREER REQUIREMENTS

- A 5-year Bachelor of Architecture degree from a program accredited by the National Architecture Accreditation Board
- A 3-year paid internship administered by the National Council of Architectural Registration Boards

Certification/Licensing

- Pass the Architect Registration Exam to get licensed (Some states may have additional licensing requirements.)
- Licensed architects may become certified by the National Council of Architectural Registration Boards, which makes it easier to get licensed in other states.
- Most states require architects to continually update their education to maintain their licenses.

Additional requirements to become a green architect:

- Take courses on green building approved by LEED (Leadership in Energy and Environmental Design) or work on a LEED project.
- Take LEED courses.
- Pass the LEED Green Associate exam.

ENGINEERS

Engineers design, build, and improve systems. Electrical engineers design and develop electrical systems and test equipment. Mechanical engineers design and operate power plants, and plan and oversee the construction of gas transmission systems. Nuclear engineers supervise the construction of nuclear power plants, monitor their operation, and research nuclear waste disposal. Energy engineers design and develop energy-efficient strategies for buildings. Environmental engineers plan ways to reduce waste, reduce energy, and recycle materials in manufacturing products. Solar energy systems engineers design solar hot water and heating systems and evaluate their energy efficiency. Wind energy engineers design wind farms, monitor their construction, and analyze their performance.

CAREER REQUIREMENTS

- A bachelor's degree in your engineering discipline from a school accredited by the Accreditation Board of Engineering and Technology
- If required in your state, pass the Fundamentals of Engineering exam given by the National Council of Examiners for Engineering and Surveying
- Work as an engineer-in-training or engineering intern for 4 years

Certification/Licensing

- Pass the Professional Engineer exam to get licensed in your state

OTHER ENERGY JOBS

Accountants analyze revenue and balance budgets for companies.

Chemists develop new energy sources such as biofuels.

Construction and building inspectors ensure that building codes are met through all phases of construction.

Control and valve technicians install and maintain regulating and controlling equipment for electrical and gas systems.

Customer service workers help customers who use the company's products or services.

Environmental economists study the financial impacts of how we use natural resources.

Facilities managers maintain and operate the buildings and grounds of a company.

Human resources professionals handle employee benefits, payroll, and hiring.

Industrial engineers design production processes to use resources more efficiently.

Installation, maintenance, and repair helpers assist with maintaining and repairing equipment.

Occupational health and safety specialists maintain a safe and healthy environment for workers.

Pipelayers put together the pipes in sewage or drainage systems.

Powerhouse, substation, and relay electrical repairers check and maintain equipment in power stations, substations, and relay circuits.

Solar sales representatives determine customers' solar needs, suggest systems, and estimate costs.

RESOURCES

U.S. Department of Energy

www.energy.gov

U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy Clean Energy Careers

www.energy.gov/eere/education/explore-clean-energy-careers

Get Into Energy

www.getintoenergy.com

U.S. Department of Labor O*Net Online

www.onetonline.org