

Energy Industries

What are the different types of industries within energy?

Energy has to be generated, distributed, and then consumed. There are jobs needed at each step. The following industries are of vital importance for this system to function properly without waste:

- **Traditional Electric Utilities**
 - Generate electricity from non-renewable sources.
- **Renewable Energy Generation**
 - Facilities generate electricity from renewable sources.
- **Electric and Gas Distribution**
 - Lines carry electricity from the source to the neighborhood.
- **Building-related Energy Efficiency**
 - Ensure electricity is not wasted by residential and commercial consumers.

All participants in the supply chain – including you! – can help reduce energy consumption and accelerate Alabama’s transition to a sustainable energy economy.

Careers in Energy

Have you considered an energy career?

Most careers in energy are better paid than the same careers in other industries. And many do not require a college degree. Which energy career is right for you? There are options in four broad areas, covering a variety of skill and education levels.

Engineering Careers

An engineer is someone who likes to solve problems. They can help make the nation's electricity usage more efficient and more reliant on clean fuels. Now that's a real difference!

Engineers in the energy field can promote sustainable and clean energy usage.

As one of these engineers, you gain all the professional advantages of working in a high-tech industry. You also have the personal satisfaction of making a difference on people's energy usage.

An engineering career in energy could be for you if you like:

- Building things from scratch
- Analyzing and evaluate various sources of information to identify where problems are likely to occur
- Translating practical problems into mathematical expressions and techniques
- Being self-directed and quick to learn new technologies

Job Title	Median Hourly Wage (Annual)	Typical Education Required	Alternative Job Titles
Architects	\$40.23 (\$83,678.40)	Bachelor's degree	Design Architect, Project Manager, Project Architect
Civil Engineers	\$39.47 (\$82,097.60)	Bachelor's degree	Civil Engineering Manager, Project Engineer, Structural Engineer
Electrical and Electronic Engineering Technicians	\$26.60 (\$55,328.00)	Associate's degree	Civil Engineering Designer, Electro-Mechanical Technician (E/M Technician), Electronics Technician
Electrical Engineers	\$42.60 (\$88,608.00)	Bachelor's degree	Broadcast Engineer, Electrical Design Engineer, Product Engineer
Electronics Engineers	\$38.02 (\$79,081.60)	Bachelor's degree	Broadcast Engineer, Electrical Design Engineer, Product Engineer
Industrial Engineering Technicians	\$24.62 (\$51,209.60)	Associate's degree	Civil Engineering Designer, Electro-Mechanical Technician (E/M Technician), Electronics Technician
Mechanical Engineers	\$38.65 (\$80,392.00)	Bachelor's degree	Equipment Engineer, Product Engineer
Nuclear Engineers	\$49.33 (\$102,606.40)	Bachelor's degree	Nuclear Design Engineer, Nuclear Licensing Engineer, Nuclear Reactor Engineer

Stationary Engineers and Boiler Operators	\$27.24 (\$56,659.20)	High school diploma or equivalent	Operating Engineer, Plant Utilities Engineer, Boiler Operator
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Installation and Repair Careers

Installers and repairers are essential to the energy industry. They install, inspect, test, and repair electrical or mechanical equipment. These careers are also well-paying. Power line installers and electrical and electronics repairers are among the top 10 best paying blue-collar careers in the United States.

Installers and repairers are essential to the energy industry.

These workers install, inspect, test, and repair electrical or mechanical equipment.

An installation or repair career in energy could be for you if you like:

- Teamwork
- Working with tools and technology
- Working outdoors
- Troubleshooting
- Physical activity like climbing and standing for long periods of time

Job Title	Median Hourly Wage (Annual)	Typical Education Required	Alternative Job Titles
Control and Valve Installers and Repairers	\$30.14 (\$62,691.20)	High school diploma or equivalent	Electric Meter Technician
Electrical and Electronics Repairers of Commercial and	\$29.20 (\$60,736.00)	College certificate	Hydro Maintenance Technician, Instrument and Electrical Technician (I and E Tech), Industrial Electrician

Industrial Equipment			
Electrical Power-Line Installers and Repairers	\$33.46 (\$69,596.80)	High school diploma or equivalent	Cable Technician, Electrical Lineworker, Installation and Repair Technician (I and R Technician)
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$24.05 (\$50,024.00)	College certificate	HVAC Installer, HVAC Specialist (Heating, Ventilation and Air Conditioning Specialist), Service Technician
Industrial Machinery Mechanics	\$25.28 (\$52,582.40)	High school diploma or equivalent	Maintenance Technician, Mechanic, Maintenance Mechanic
Installation, Maintenance, and Repair Helpers	\$11.67 (\$24,273.60)	High school diploma or equivalent	Building Equipment Operator (BEO), Maintenance Mechanic, Maintenance Technician
Powerhouse, Substation, and Relay Electrical and Electronics Repairers	\$35.92 (\$74,713.60)	College certificate	Instrument and Controls (I and C) Technician, Relay Technician, Substation Mechanic
Solar Photovoltaic Installers	\$19.53 (\$40,622.40)	High school diploma or equivalent	Electro-Mechanical Solar Technician, Photovoltaic Testing Technician (PV Testing Technician), Solar Panel Installer
Supervisors of Mechanics, Installers, and Repairers	\$29.78 (\$61,942.40)	High school diploma or equivalent	Plant Manager, Construction Foreman, Production Supervisor

Wind Turbine Service Technicians	\$23.35 (448,568)	Some college, no degree	Offshore Wind Turbine Technician, Windmill Technician, Windsmith
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Production Careers

Production workers in energy are mostly employed in power plants, often combining the duties of operators and technicians. Due to their high technical skills and union contracts, these workers can earn double the salary of what their counterparts in other industries earn. For example, the median salary for production workers in Alabama is \$19.96 an hour while the median salary of workers in electric power generation, transmission, and distribution is \$30.08 an hour.

A production career in energy could be for you if you like:

- Working with current tools and technology and learning about ones that are new and emerging
- Keeping equipment in top condition
- Teamwork
- Leading and coordinating others in everyday situations as well as in emergencies (such as in a major storm)

Job Title	Median Hourly Wage (Annual)	Typical Education Required	Alternative Job Titles
Chemical Equipment Operators	\$25.14 (\$52,291.20)	High school diploma or equivalent	Chemical Processor, Production Technician, Chemical Operator
Chemical Plant and System Operators	\$18.37 (\$38,209.60)	High school diploma or equivalent	Chemical Operator, Process Operator, Process Technician
Gas Plant Operators	\$28.61 (\$59,508.80)	High school diploma or equivalent	Gas Dispatcher, Refinery Operator, Plant Operator

Nuclear Power Reactor Operators	N/A	High school diploma or equivalent	Nuclear Control Room Operator, Operations and Maintenance Technician (O and M Technician), Transmission System Operator
Petroleum Pump System and Refinery Operators	\$26.98 (\$56,118.40)	High school diploma or equivalent	Gas Dispatcher, Refinery Operator, Plant Operator
Power Distributors and Dispatchers	\$36.97 (\$76,897.60)	High school diploma or equivalent	Nuclear Control Room Operator, Operations and Maintenance Technician (O and M Technician), Transmission System Operator
Power Plant Operators	\$34.15 (\$71,032)	High school diploma or equivalent	Nuclear Control Room Operator, Operations and Maintenance Technician (O and M Technician), Transmission System Operator
Supervisors of Production and Operating Workers	\$27.47 (\$57,137.60)	College certificate	Plant Manager, Construction Foreman, Production Supervisor
Welders, Cutters, Solderers, and Brazers	\$19.42 (\$40,393.60)	High school diploma or equivalent	Fabricator, Maintenance Welder, Welder-Fitter

Construction Careers

Since saving energy is as important as generating energy from scratch, all careers involved in energy-efficient construction and building operations belong to the energy sector. Some construction workers, like plumbers and pipelayers, can be employed in utilities as well as in commercial and residential building retrofitting.

A construction career in energy could be for you if you like:

- Teamwork
- Using heavy equipment or hand and power tools
- Working outdoors
- Dealing professionally with customers, sometimes in stressful situations
- Helping the community

Job Title	Median Hourly Wage (Annual)	Typical Education Required	Alternative Job Titles
Construction and Building Inspectors	\$31.33 (\$65,166.40)	High school diploma or equivalent	Associate Architect, Building Code Administrator, Engineering Technician
Construction Managers	\$41.79 (\$86,923.20)	Bachelor's degree	Construction Foreman, General Contractor, Project Superintendent
Electricians	\$28.90 (\$60,112.00)	High school diploma or equivalent	Inside Wireman, Journeyman Electrician, Maintenance Electrician
Operating Engineers and Other Construction Equipment Operators	\$26.41 (\$54,932.80)	High school diploma or equivalent	Back Hoe Operator, Heavy Equipment Operator, Loader Operator

Pipelayers	\$25.83 (\$53,726.40)	Less than high school	Construction Laborer, Equipment Operator, Laborer
Plumbers	\$33.21 (\$69,076.80)	High school diploma or equivalent	Machine Repairman, Steamfitter, Welder
Supervisors of Construction and Extraction Workers	\$33.04 (\$68,669.12)	High school diploma or equivalent	Plant Manager, Construction Foreman, Production Supervisor

Energy Education Programs

- Calhoun Community College
 - Associate in Applied Science degree in Applied Technology with a major in Industrial Energy Specialist. This degree is designed to prepare graduates to support the state of Alabama’s strategies to improve the productivity and competitiveness of the industrial sector by increasing energy efficiency in processes and facilities. The curriculum provides the student with a well-balanced content of management skills along with technical exposure to cutting edge energy efficiency and applications of advanced on site energy production and storage. The Industrial Energy Specialist will be responsible for identifying and implementing energy savings projects that will make his company more competitive in the world market. (Cogeneration, Load balancing, Process efficiency as well as industrial water usage) are just a few of the areas of study. Coop or internship with industry is required for completion of the degree. This curriculum also provides as preparation for multiple nationally recognized certifications.
 - The Associate of Applied Science degree in Applied Technology with a major in Renewable Energy Technology will prepare graduates with the applicable principles and knowledge of solar, wind, and hydropower energy technology and instill a broader understanding of the scientific, economic and political context of the industry. Calhoun Students in the Renewable Energy program will learn and train in the brand new, state of the art Alabama Center for Excellence in Clean Energy Technology (ACECET) facility on the Calhoun campus, and will leave Calhoun prepared to excel in this rapidly expanding industry.

- 24KW on grid P.V. system used to power 80% of the ACECET Building. This system is used to train technicians on installation and maintenance of large scale systems.
- Geothermal training system complete with 20 vertical wells, slinky and serpentine configurations for in field study.
- University of Alabama in Huntsville (Charger Energy Laboratory)
 - Fully functional smart building being used for energy security and resiliency studies, and innovative energy management strategies
 - Hybrid energy research team evaluating technologies for conserving fossil fuels and reducing carbon emissions
 - Electric vehicle development center
 - Advanced thermal energy storage research using phase change materials
 - Life cycle cost modelling and analysis to evaluate cost-effective energy architectures
 - Cyber security of distributed energy systems

Training and Certifications

- North American Board of Certified Energy Professionals (NABCEP)
 - The North American Board of Certified Energy Practitioners (NABCEP) offers entry level knowledge assessment, professional certification, and company accreditation programs to renewable energy professionals throughout North America. Raising industry standards and promoting consumer confidence, NABCEP is known as the “gold standard” for PV and Solar Heating Installation and PV Technical Sales Certifications.
- Building Performance Institute (BPI)
 - The Building Performance Institute is the nation's premier credentialing, quality assurance and standards setting organization for home performance professionals. Since 1993, BPI has been setting technical standards for home energy auditing and energy efficiency upgrades. We develop BPI Standards using an open, consensus-based process built on sound building science. From these standards, we develop rigorous written and field exams leading to professional certifications for individuals, companywide credentials for BPI GoldStar Contractors and quality assurance services that help raise the bar in home performance contracting.
- Home Energy Rating System (HERS) Rater
 - An individual who is certified by an accredited HERS Provider to inspect and test a home in order to evaluate each of the minimum rated features established by RESNET and prepare a comprehensive HERS rating according to Chapters One and Three of the RESNET Mortgage Industry National Home Energy Rating.
- Certified Energy Manager (CEM)

- The designation CEM, which stands for Certified Energy Manager®, recognizes individuals who have demonstrated high levels of experience, competence, proficiency, and ethical fitness in the energy management profession. By attaining the status of CEM, you will be joining an elite group of 14,500 professionals serving industry, business and government throughout the U.S. and in 25 countries abroad. These high-achieving individuals comprise a "Who's Who" in the energy management field.

Local Community and Industry Groups

- Energy Alabama
 - A non-profit organization accelerating Alabama's transition to sustainable energy. The organization focuses on education, policy, and technical assistance.
- Energy Huntsville
 - Diversifying the region's economy, workforce and business environment to include energy applications and innovations by linking the commercial and government contracting strengths of the greater Huntsville region with key customer requirements, market forces and national policy directives for advanced energy systems and applications.
- Association of Energy Engineers - Huntsville Chapter
 - A source for information and networking in the dynamic fields of energy engineering and energy management, renewable and alternative energy, power generation, energy services, sustainability and all related areas.
- United States Green Building Council - Alabama Chapter
 - USGBC Alabama is at the forefront of environmentally-sensible development and sustainability in the state. They work at the national and regional levels to advocate for high performance healthy buildings, and deliver high-quality sustainable building education and networking opportunities.

National Resources

- United States Green Building Council (USGBC) - <http://usbc.org>
- Association of Energy Engineers - <http://aeecenter.org>
- Rocky Mountain Institute - <http://rmi.org>
- American Council for an Energy Efficiency Economy - <http://aceee.org>
- Alliance to Save Energy - <http://ase.org>

Try it Out!

Try out a energy career before you leave high school.

Think you might be interested in finding an energy job someday? Not sure if energy is a good fit for you? You don't have to wait until high school is over to start exploring energy options.

Join a green club or committee. You don't have to become the president of the green club, but go to a few meetings to learn about what's happening at your school. If your school doesn't have one, consider starting your own club around issues like reducing energy consumption, recycling, carpooling, composting food waste in the cafeteria, reusing school supplies, or wasting less paper.

Volunteer with the building operations crew at your school. Offer to help with recycling or trash-pickup around the school. Or you could check doors and windows for energy loss.

Ask teachers to consider incorporating energy into class work.

Science classes can focus on environmental science or topics like pollution, renewable energy, or biodiversity. Language arts courses can read environmental novels or write essays about energy or environmental topics. Social studies courses can incorporate energy by studying the history and impact of sustainable energy and/or traditional energy or by incorporating innovative ideas and topics into speech or debate exercises.

Take a service-learning course or get an internship with a local engineering firm, architecture or planning firm, construction company, or university. Research potential sites online to see what green projects or practices are already happening:

- Volunteer with Energy Alabama.
- Find a LEED-certified professional or company.
- Look up companies that operate in energy efficiency or renewable energy and ask to help.
- Explore semester-long programs at specialized schools.