

CTE: THE KEY TO ECONOMIC DEVELOPMENT

Energy:
Is a
\$350 billion
industry¹

Employs
7 million
people²

Pays a median income of
\$75,000³

Includes **fast-growing**
occupations⁴

What is the pathway to these
fulfilling and essential careers?

Career and Technical Education!



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Association for Career and Technical Education
1410 King Street, Alexandria, VA 22314
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Energy

Energy is a vital economic driver that:

- includes hydroelectric, solar, geothermal, wind, biomass and tidal sources as well as electric, oil, natural gas, coal and nuclear power
- powers residential and commercial buildings and transportation
- requires high-skilled workers

What jobs are available in energy?

The energy industry employs 7 million workers who help power our homes, offices, schools, hospitals, cars and more. With consumers and policymakers increasingly focused on improving and diversifying energy production and distribution, job opportunities are expanding in providing clean energy, helping the environment and conserving natural resources. This includes about 320 unique occupations in clean energy production, energy efficiency and environmental management.⁵ Several of the fastest-growing occupations are green jobs such as solar photovoltaic installers and wind turbine service technicians. In addition, more than 62,000 new electricians, who are essential to power plant and grid operations, will be needed in the next decade owing to retirements and demand for alternative energy sources.⁶ Retirements will also fuel the demand for technicians, plant/field operators, lineworkers and engineers—these occupations make up almost half of the energy workforce.⁷

Workers across the energy sector earn more than the national average.⁸ In fact, clean energy jobs are some of the highest-paying occupations for people with less than a bachelor's degree, with a wider range of jobs that pay between \$20 and \$35 per hour than other sectors.⁹ For example, wind turbine technician occupations offer a median yearly wage of \$53,000; electrical engineering technicians earn about \$65,200, on average.¹⁰

While some energy occupations require a four-year degree, many others require less education: an associate degree, a postsecondary or apprenticeship certificate, a license or an industry-recognized certification. This is particularly true for jobs in clean energy production and energy efficiency.¹¹ These energy occupations require academic, employability and technical skills, including skills in construction, repair, manufacturing, engineering and extraction, as well as skills in IT, accounting and marketing. However, 80% of green energy employers report they are having trouble filling job openings with qualified candidates.¹² Careers in this growing sector include:¹³

- engineering technicians
- environmental analysts
- plant operators
- welders and pipefitters
- IT specialists
- electricians
- compliance managers
- natural gas technicians



Endnotes

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How does CTE prepare the energy workforce?

Career and technical education prepares high school, postsecondary and adult students for careers in energy through:

- the national Career Clusters® Framework—including Career Clusters and pathways in architecture and construction, manufacturing and STEM (plus some states have a specific energy Career Cluster devoted to preparation for this sector)—which outlines course progressions that help students explore career options and prepare for college and career success
- CTE courses in power and mechanics, industrial electricity, engineering technology, alternative energy, wind turbine construction and operation, environmental sustainability and more, all integrated with challenging academics
- business-education partnerships, such as the Western Maricopa Education Center (West-MEC) Southwest Energy Partners Campus, a partnership between a CTE district in the Phoenix metro area, Estrella Mountain Community College and the Palo Verde Generating Station that allows students to earn up to 24 college credits and industry certifications and qualify for internships¹⁴
- career and technical student organization enrichment experiences, such as Technology Student Association and SkillsUSA events
- opportunities to earn stackable postsecondary certificates, degrees and industry-recognized certifications, as outlined in resources such as the Center for Energy Workforce Development's Get Into Energy Career Pathways Roadmaps at GetIntoEnergy.com¹⁵

What are promising programs in energy?

The California Department of Education has partnered with Pacific Gas and Electric (PG&E) to establish **New Energy Academies**, immersive energy training programs that address the needs of a growing green technology workforce and prepare students for college and careers in energy. PG&E has supported these academies through grants for equipment and other needs, targeted professional development workshops and assistance from education, industry and government experts.¹⁶ In addition, this partnership has provided students with paid industry experiences during which learners earn certifications, including OSHA-10; complete an authentic project in a real-world environment; work in a PG&E department; and practice interview skills, develop resumes and learn about workplace etiquette.¹⁷ **Independence High School** in Bakersville is one of five schools that has partnered with PG&E to prepare students for college and the local energy workforce, which is rich in opportunities in heat and power cogeneration facilities, wind farms and other energy firms. The academy curriculum at Independence includes math, English and science integrated with courses in energy, energy conservation and energy technology.¹⁸

West Virginia's **Blue Ridge Community and Technical College (CTC)**, in collaboration with Allegheny Energy, created the Electric Distribution Engineering Technology certificate program to prepare learners for jobs as utility lineworkers. The program is endorsed by the Utility Workers Union of America Local 102 and provides opportunities for students to enter a field that has typically been limited to internal apprenticeships. Academic instruction gives students an understanding of the technology fueling today's electrical utilities, while pole training and equipment labs develop skills in operating bucket trucks and digger derricks, reading and interpreting power systems layout drawings, climbing utility poles safely, augering holes and erecting utility poles, and more. Graduates are ready for immediate employment as lineworkers, a very high-demand occupation that pays \$30,000-\$50,000 per year.¹⁹ In addition, through Blue Ridge CTC's College in the High School initiative, students can enroll in postsecondary courses in this and other programs and receive credit with both the high school and the college.²⁰