Energy is a vital economic driver that:

- includes petroleum (oil), natural gas, coal and nuclear, as well as renewable energy through hydropower, solar, geothermal, wind and biomass
- is used in residential and commercial buildings, in transportation and by business and industry
- requires high-skilled workers

What jobs are available in energy?
The energy sector is facing significant workforce shortages—an estimated 55 percent of the energy workforce may need to be replaced by 2023. Among the most critical jobs that will need filling are engineers and skilled utility technicians. Talent shortages encompass the entire sector. Renewable energy fields are in need of qualified workers: Up to 290,000 potential new jobs are projected in solar energy by 2030. Shale energy is expected to create up to 1.7 million permanent jobs by the end of this decade. And almost 3 million workers will be needed by 2020 in oil and gas exploration and extraction.

Many energy jobs are middle-skill occupations that provide a family-sustaining wage. In almost every large metropolitan area, the majority of clean economy jobs are mid-level occupations, and these jobs pay a median wage 13 percent higher than the national median wage. Annual earnings in the oil and natural gas industry averaged $107,000 in 2012, and 47 percent of a shale well’s workforce consists of jobs that require less than a four-year degree.

Many jobs in this sector are attainable for individuals with an industry certification, a postsecondary certificate or an associate degree, as well as for those who have completed an apprenticeship. These energy occupations require academic, employability and technical skills, including skills in construction, safety, engineering and drilling procedures, as well as skills in accounting and business management. However, almost three-quarters of energy employers report they are having trouble filling job openings with qualified candidates.

Careers in this growing sector include:

- engineers
- HVAC mechanics and installers
- construction managers
- lineworkers
- chemists
- utility technicians
- welders
- plant operators
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 manufacturing, STEM, and architecture and construction (plus some states have an 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 various types of energy generation, wind turbine construction, computer-integrated manufacturing and welding, all integrated with challenging academics

- business-education partnerships, such as the Power Plant Technology Institute at Indian River State College, developed with Florida Power and Light and the International Brotherhood of Electrical Workers, from which more than 90 percent of graduates have been placed in high-paying energy-related positions

- 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 Roadmap

What are promising programs in energy?

In California, Oxnard High School’s Green Technologies Academy offers students an opportunity to take hands-on courses to gain skills and knowledge for a green technology workplace. Classes include Project Lead the Way (PLTW) Principles of Engineering and AP Environmental Science, and next year the curriculum will add PLTW Environmental Sustainability and a capstone elective, PLTW Engineering Design and Development. Students build on this learning through internships, mentorships, leadership activities and such projects as creating a mock power company. Through this mock company, students have identified homes that would benefit from solar panels, as well as determined panel placement and the amount of energy the panels would generate. Students also participate in activities such as teaching environmental awareness and planning an environmental awareness/alternative energy fair. The school’s business partners include California Solar Electric, Reliant Energy and SunPower Corporation.

Louisiana’s Fletcher Technical Community College and BP America, Inc., have joined together to develop the Integrated Production Technologies Center, funded by a $4 million investment from BP and a $4 million match from the state. These funds enabled the college to build a state-of-the-art, nearly 30,000-square-foot training facility near BP’s Houma location. Fletcher’s BP Integrated Production Technologies Building, which has been designated a Deepwater Center for Workforce Excellence, prepares students in deepwater production and safety. Students develop skills in computer applications, instrumentation, mathematics, electronics, fluid mechanics, process diagrams and process systems, while completing the curriculum for an Associate of Applied Science in Integrated Production Technologies or a Certificate of Technical Studies. The program’s industry advisory board projects starting salaries of $60,000 for graduates.