



Energy and Utilities Industry Sector

Because the Energy and Utilities industry sector consists of many different companies and products, skills developed in one segment may be transferable to other segments. The career pathways in this sector emphasize real-world, occupationally relevant experiences of significant scope and depth. Students with skills in specific segments will be prepared to enter local, state, and national employment markets. This sector's career pathways provide career opportunities for persons with varying levels of experience and education, and the sector is forecast to experience significant growth in employment over the next decade, particularly in jobs related to water and sewage systems. In addition, production workers' earnings are significantly higher than those in most other industries.

The Electromechanical Installation and Maintenance pathway provides learning opportunities for students interested in working in production, installation, maintenance, and repair. In this pathway, students learn how to maintain and repair pipelines and power lines, operate and repair plant machinery, and monitor treatment processes. The Energy and Environmental Technology pathway provides learning experiences for students interested in energy production and environmental concerns including how to install, repair, and maintain power-generating stations, gas plants, water treatment plants, and wet-sewage treatment plants. The Public Utilities pathway provides opportunities for students interested in a variety of public utility industries, including but not limited to power plant operation, power distribution and dispatching, and operation of water treatment plants or wastewater plants. The Residential and Commercial Energy and Utilities pathway provides learning opportunities for obtaining, verifying, and maintaining primary financial data and records, including recording the usage of electricity, gas, water, and sewer utilities.

Energy and Utilities Industry Sector Pathways:

- *Electromechanical Installation and Maintenance*
- *Energy and Environmental Technology*
- *Public Utilities*
- *Residential and Commercial Energy and Utilities*

Entry Level Careers

(with high school diploma)

- Cable Splicer
- Meter Reader
- Tower Technician
- Solar Installer
- Sewer Worker
- Public Works Maintenance Worker
- Waste Management Worker
- Residential Energy Auditor

Technical Level Careers

(with AA or AS degree or certificate)

- Heating & Air Conditioning Installer
- Solar Technician
- Industry Facilities Technician
- Power Plant Technician
- Utilities Operator
- Wind Technician
- Journeyman Lineman
- Underground Inspector
- Generation Dispatcher
- Load Forecaster
- Instrumentation Control Technician

Professional Level Careers

(with BS or BA degree)

- HVAC Technician Engineer
- Energy Analyst
- Public Works Director
- Environmental Engineer
- Sustainability Engineer
- Cell Scientist
- Renewable Program Coordinator



Residential and Commercial Energy and Utilities Pathway

Sample CTE Courses*

Education Level and Related Occupations**

Introductory	Concentration	Capstone	High School Diploma	Certification and/or AA Degree	Bachelor's Degree or Higher
<ul style="list-style-type: none"> ▪ Exploring Technology ▪ Technology Core 	<ul style="list-style-type: none"> ▪ Drafting ▪ Machining Facility ▪ Woods 	<ul style="list-style-type: none"> ▪ CAD/COM ▪ Construction ▪ HVAC Technician 	<ul style="list-style-type: none"> ▪ Electrical Helper ▪ Entertainment System Helper ▪ HVAC Worker ▪ Industrial Maintenance Worker ▪ Solar Helper 	<ul style="list-style-type: none"> ▪ Electrician/Technician ▪ Entertainment System Technician/Installer ▪ Facilities Technician ▪ Industrial Maintenance Technician /Worker ▪ Solar Technician 	<ul style="list-style-type: none"> ▪ Electrical Engineer ▪ Entertainment System Engineer ▪ Facilities/Maintenance Engineer ▪ Industrial Maintenance Engineer ▪ Solar Engineer

*Sample CTE Courses are from the Career Technical Education Framework for California Public Schools (California Department of Education: 2007, <http://www.cde.ca.gov/re/pn/fd/>)

**Visit ASSIST (www2.assist.org/browseAreas.do) for community college and UC/CSU information and California Career Zone (www.cacareerzone.org) for occupation information.

Related Career Technical Student Organization: SkillsUSA (<http://www.skillsusa.com>)

Additional Industry Sector information available through the California Industrial and Technology Education Consortium (<http://www.citeonline.org>).



Electromechanical Installation and Maintenance Pathway

Sample CTE Courses*

Education Level and Related Occupations**

Introductory	Concentration	Capstone	High School Diploma	Certification and/or AA Degree	Bachelor's Degree or Higher
<ul style="list-style-type: none"> ▪ Exploring Technology ▪ Technology Core 	<ul style="list-style-type: none"> ▪ Drafting ▪ Computer Applications ▪ Consumer Electronics 	<ul style="list-style-type: none"> ▪ A Plus Certification ▪ CAD/CAM ▪ Technical Writing 	<ul style="list-style-type: none"> ▪ Appliance Worker ▪ Electrical Worker ▪ Electronic Equipment Worker ▪ Electronic Utility Worker ▪ Power Meter Reader 	<ul style="list-style-type: none"> ▪ Appliance Repair Technicians ▪ Electrical Technician ▪ Instrument Calibration Repairers ▪ Meter Installers/Repairers ▪ Utility Technicians 	<ul style="list-style-type: none"> ▪ Cabinetmaking Instructor+ ▪ Designer ▪ Meter Service Engineer+

Energy and Environmental Technology Pathway

Sample CTE Courses*

Education Level and Related Occupations**

Introductory	Concentration	Capstone	High School Diploma	Certification and/or AA Degree	Bachelor's Degree or Higher
<ul style="list-style-type: none"> ▪ Exploring Technology ▪ Technology Core 	<ul style="list-style-type: none"> ▪ Consumer Electronics ▪ Machining ▪ Engine Repair and Maintenance 	<ul style="list-style-type: none"> ▪ Electronic Repair and Maintenance ▪ Electronics ▪ Metal Manufacturing 	<ul style="list-style-type: none"> ▪ Energy Management Worker ▪ Environmental Pollution Worker ▪ Industrial Facilities Worker ▪ Utilities Worker ▪ Waste Management Worker 	<ul style="list-style-type: none"> ▪ Energy Management Technician ▪ Environmental Pollution Technician ▪ Industrial Facilities Technician ▪ Utilities Technician ▪ Waste Management Technician 	<ul style="list-style-type: none"> ▪ Energy Management Engineer+ ▪ Environmental Pollution Engineer+ ▪ Industrial Facilities Engineer+ ▪ Utilities Engineer+ ▪ Waste Management Engineer+

Public Utilities Pathway

Sample CTE Courses*

Education Level and Related Occupations**

Introductory	Concentration	Capstone	High School Diploma	Certification and/or AA Degree	Bachelor's Degree or Higher
<ul style="list-style-type: none"> ▪ Exploring Technology ▪ Technology Core 	<ul style="list-style-type: none"> ▪ Consumer Electronics ▪ Machining ▪ Environmental Science 	<ul style="list-style-type: none"> ▪ Electronic Repair and Maintenance ▪ Hazardous Materials Management ▪ Metal Manufacturing 	<ul style="list-style-type: none"> ▪ Meter Reader ▪ Power Line Worker ▪ Facility Worker ▪ Waste Management Worker 	<ul style="list-style-type: none"> ▪ Meter Installer ▪ Power Line Technician ▪ Facility Technician ▪ Waste/Sewer Technician 	<ul style="list-style-type: none"> ▪ Meter Design Engineer+ ▪ Power Grid Engineer+ ▪ Facilities Design Engineer+ ▪ Sanitation Engineer+

*Sample CTE Courses are from the Career Technical Education Framework for California Public Schools (California Department of Education: 2007, <http://www.cde.ca.gov/re/pn/fd/>)

**Visit ASSIST (www2.assist.org/browseAreas.do) for community college and UC/CSU information and California Career Zone (www.cacareerzone.org) for occupation information.

+This occupation requires certification or licensure.

Related Career Technical Student Organization: SkillsUSA (<http://www.skillsusaca.com>)

Additional Industry Sector information available through the California Industrial and Technology Education Consortium (<http://www.citeonline.org>).

CAREER OPPORTUNITIES IN ENERGY AND UTILITIES INDUSTRY SECTOR

10 TIPS FOR CHOOSING THE RIGHT CAREER FOR YOU

*How does a person know what career to work toward?
There is no perfect answer, but the following 10 tips will
get you off to a good start.*

- 1 Get to know yourself** – Complete more than one self-assessment test.
- 2 Identify your strengths and weaknesses** – What do you do well and what do you not do well?
- 3 Develop an inventory of careers** – Write down some careers that might interest you.
- 4 Research different careers** – Talk to others and use the Internet.
- 5 Write the pros and cons** – List positives and negatives about the careers that interest you.
- 6 Network** – Discuss your ideas with others.
- 7 Talk with people who work in your area of interest** – Family and friends are great resources.
- 8 Find a mentor** – Find someone with whom you can discuss your career selection.
- 9 Experiment** – Take a related class or part-time job.
- 10 Don't give up** – "If there is a will, there is a way."



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Plan For Success
Visit statecenter.com/industrysectors





Utilizing renewable energy and sustainable resources will impact our future for generations to come. Hydroelectric, geothermal, and nuclear power are part of the current resources, but what new energy technology might the future hold? Doing more with less will likely be a focus of future research and development.

Pollution created by energy and utility use poses a significant challenge for environmentalists and scientists current and future. Improving the recycling of waste materials from trash to sewage will offer many employment opportunities in the Energy and Utilities Industry Sector.

Web sites for further information:

www.californiacareers.info

www.whodouwant2be.com

www.californiacolleges.edu

www.edd.ca.gov/Jobs_and_Training/

Career Pathways



Electromechanical Installation and Maintenance Pathway

Electromechanical refers to the combining of electrical and mechanical parts in devices such as electric motors, loudspeakers, and adding machines. Students will need to understand energy conversion processes and energy transmission systems, as well as the installation and maintenance of equipment used in this field.

CAREERS/CAREER AREAS:

- *Power Meter Installer/Reader*
- *Appliance Repair*
- *Utility Technician*
- *Instrument Calibration*
- *Major Appliance Designer*
- *Electrical Engineer*



Energy and Environmental Technology Pathway

Individuals preparing for careers in energy and environmental technology will need to develop a working knowledge of related available resources and how the use

of these resources and systems impact the environment. Conservation methods including procedures to measure energy efficiency will be important for the future of our nation.

CAREERS/CAREER AREAS:

- *Energy Management*
- *Environmental Pollution Control*
- *Waste Management*
- *Natural Gas, Chemical, Petroleum, and Nuclear Engineer*
- *Energy/Environmental Technician and Engineer*



Residential and Commercial Energy and Utilities Pathway

The Residential and Commercial Energy and Utilities Pathway provides learning opportunities for jobs involved in obtaining, verifying, and maintaining primary financial data and records for the usage of electricity, gas, water, and sewer utilities. Technicians and engineers are needed to develop, operate, and maintain energy and utility systems for homes and businesses.

CAREERS/CAREER AREAS:

- *Solar Technician/Engineer*
- *Electrical Technician/Engineer*
- *Facilities Technician/Engineer*
- *Industrial Maintenance Technician/Engineer*
- *HVAC Technician/Engineer*



Public Utilities Pathway

The word "utilities" refers to the set of services associated with electricity, natural gas, water, and sewage. Because these services are expensive to develop, operate, and maintain, utility companies are primarily "public" in governance. However, a growing number of privately-owned utilities are emerging. Public utility companies are subject to government control and regulation, and employ a large number of people.

CAREERS/CAREER AREAS:

- *Energy Management Technician/Engineer*
- *Utilities Technician/Engineer*
- *Power Grid Engineer*
- *Waste Technician/Engineer*
- *Facility Design Engineer*
- *Industrial Facilities Technician/Engineer*
- *Gas, Chemical and Nuclear Engineer*
- *Utilities Technician*
- *Water Systems Technician*



TIPS FOR JOB SEEKERS

How can you improve your chances of getting a job? Applying for a job is the easy part, but getting it can be more of a challenge. Following these five tips can help you reach your goal:

1 The Job

- Determine your interests: talk to others and consider your hobbies and talents
- Search “career assessments” on the Internet

2 The Resume

- Should be easy to read: not too long, too wordy or too cluttered
- Make it powerful
- Show you can cooperate, you can learn, and you can do

3 The Application

- Make it neat, complete and accurate
- Include recommendations from teachers, employers, coaches, friends, etc.

4 The Interview

- Show enthusiasm: it separates the winners from the losers
- Dress appropriately/similar to those on the job

5 The Follow-up

- Send a thank you note
- Call to see if a decision has been made
- If not, ask, “Am I still a candidate?”
- If you are, ask, “Is it okay if I call back in a couple of days?”



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