

Energy Career Pathways

GREAT JOBS IN ENERGY!

There are great reasons why you should consider a job in the Energy Industry.

Consumers Energy

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DTE Energy[®]

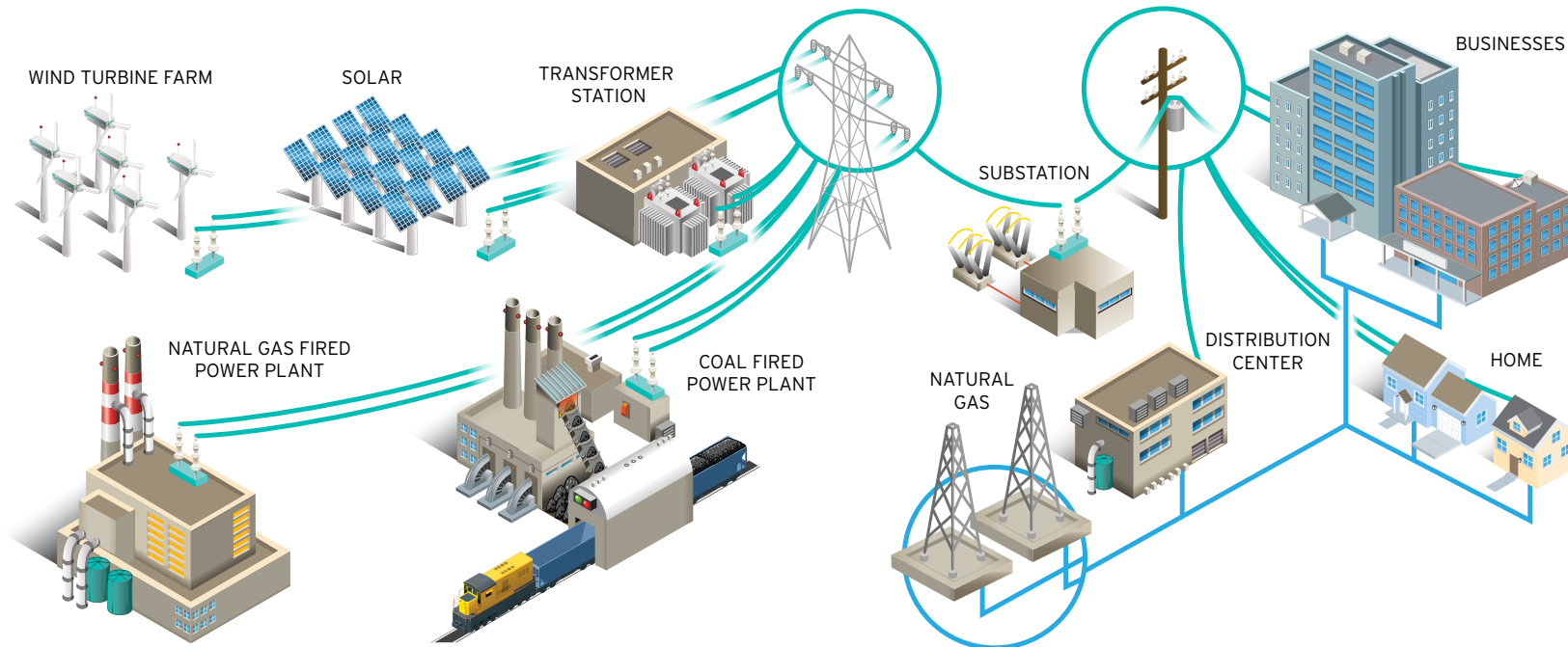


Energy Career Pathways

Energy transmission and distribution are essential to our way of life - from the generation of electricity or gas products to the maintenance of power lines or gas lines near our homes and businesses. Every point along this path requires someone to construct or maintain it - this means jobs now AND in the future. There is an increasing need to fill these positions as large numbers of "baby-boomers" continue to retire and, since almost every community in the United States has a similar infrastructure, the need is evident in most parts of the country. Salaries are great and demand is high: take a look!

Advantages to Technical Careers in the Energy Industry

- Excellent salaries and great benefits
- High job placement; huge industry need in most fields
- Jobs in your desired location
- Hands-on outdoor work
- Life-long careers serving your community
- Only 1 or 2 years of formal learning required; lower cost and less loan debt than a four-year college experience



Basic skills and knowledge to be successful

With the right education and training in the following subjects and activities, you can begin a rewarding, well-paying energy career:

- English / Language Arts / Technical Writing
- Math (algebra, geometry, trigonometry)
- Construction Math or Statistics
- Earth or Life Physical Science
- Environmental Science
- Chemistry
- Physics
- History
- Psychology or Interpersonal Skills
- Economics
- Sociology
- Individual drivers license / commercial drivers license

During the hiring process, many companies may require a physical abilities test, a behavioral assessment, an aptitude or skills test, a pre-employment background check and drug screening.



Electric Line-Worker

What will you do?	What competencies will you need? <i>(built on energy foundational competencies – incremental as career advances)</i>
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Note: Most utilities use a pre-employment test – to pass you will need math, communications, problem solving, and mechanical reasoning skills.

STARTING OFF AS A LINE HELPER: <ul style="list-style-type: none"> • Provide assistance to line crew by providing tools and equipment • Make work area safe • Drive equipment to job site 	<ul style="list-style-type: none"> • Teamwork • Be comfortable with heights • Math skills including algebra, trigonometry, and geometry • Drive heavy commercial vehicles • Lift 75 lbs • Listen and follow directions • Come to work on time and prepared
TRAINING COMPONENTS: <ul style="list-style-type: none"> • Alternating Current / Direct Current • Pole climbing • Stringing cable • Installing transformers and other pole top equipment 	<ul style="list-style-type: none"> • Apply knowledge learned during training to work environment

LINE-WORKER:

- Install equipment on poles
- Climb poles
- Identify defective devices such as fuses, switches, and wires
- Lay underground cable
- Inspect and test power lines

- Define how the various parts of systems interact (e.g., parts of the distribution systems) and diagnose the effect on the system of changes or malfunctions in its parts
- Solve problems involving limited options by applying common sense understandings such as selecting the correct cutting tool or equipment for a job
- Listen to and understand customer needs
- Be able to stand for long periods of time
- Understand mechanical relationships in practical situations such as understanding leverage, how pulleys work, and the direction gear arrangements turn
- Visualize length, width, thickness, height, or depth and the differences among shapes, widths, or lengths

SENIOR-LEVEL CREW LEADERS:

- Supervise crew members
- Determine schedules and work activities
- Check for unsafe work conditions
- Communicate with customers
- Install equipment on poles
- Climb poles
- Identify defective devices such as fuses, switches, and wires
- Lay underground cable
- Inspect and test power lines

- Handle customer concerns and issues
- Assign priority or sequence to the steps for completing a job
- Coordinate several competing activities for efficient use of time and material
- Adapt work procedures or priorities in response to changing or unforeseen requirements or conditions

SUPERVISOR:

- Schedule and oversee work of line crews
- Review crew member performance and provide feedback
- Develop and send reports to management

- Financial management
- Computer skills for report preparation
- People management
- Communication skills

Industry Job Title	% Job Growth 2022*	Median Wage/Hr
Overhead and Underground Electric Line-Worker	7%	\$34

Source: Michigan Department of Technology, Management and Budget: Labor Market Information

*Percentage Job Growth 2022: This number represents the percentage growth rate in the occupation from 2012 to 2022.

Substation Operations

What will you do?	What competencies will you need? <i>(built on energy foundational competencies – incremental as career advances)</i>
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Note: Most utilities use a pre-employment test – to pass you will need math, communications, problem solving, and mechanical reasoning skills.

TRAINING COMPONENTS:

- Fundamentals of Electricity (Alternating Current / Direct Current)
- Substation Mechanical Operations
- Advanced Substation Mechanics
- Computer Aided Design and Drafting
- Electric Distribution Fundamentals: Technical-Advanced
- 4 KV & 13 KV Basic Relaying
- Generator Relaying
- Fundamentals of Electronic Test Equipment
- Transmission Relaying
- Polyphase Meter
- Transformer Meter
- Wiring Inspection
- Advanced Meter

- Teamwork
- Lift 75 lbs
- Listen and follow directions
- Math skills including algebra, trigonometry, and geometry
- Come to work on time and prepared
- Physical ability to climb stairs and ladders
- Operate stiff valves manually, lift weights, control pneumatic or hydraulic wrenches
- Read and interpret information displayed in simple graphic, chart, or print form (e.g., blueprints, sketches, diagrams, or drawings).
- Apply knowledge learned in training to work environment

EXPERIENCED TECHNICIAN:

- Read diagrams of electric circuits
- Serve as an expert on how a substation works and its equipment
- Perform routine operations at the substation
- Open and close switches to isolate defective relays, then perform adjustments or repairs
- Inspect and test equipment to identify problems using special wiring diagrams and testing devices
- Disconnect and replace equipment that manages voltage on high voltage power lines
- Set, repair and remove meters
- Inspect wiring to meters
- Participate in surveying to lay out installation of new customer services
- Inspect project sites to ensure crews are following design specification

- Use information to diagnose and solve problems
- Manage multiple tasks at once
- Demonstrate understanding of basic mechanical principles (e.g., gear trains, centrifugal force, heat flow)
- Comprehend entire systems and how they function
- Foresee system implications of malfunctions or of own actions
- Anticipate required future conditions in numerous interacting systems
- Evaluate alternative procedures and select the most effective approach to a job in terms of safety, time, material, or other requirements.
- Solve problems involving limited options (e.g., selecting the correct instrument or gauge for a job).
- Adapt work procedures or priorities in response to changing or unforeseen requirements or conditions

UTILITY SUPERVISOR:

- Determine schedules and work activities of team members
- Review team member performance and provide feedback
- Prepare and manage budgets
- Develop and send reports to management
- Deal with potentially stressful situations
- Financial management
- Computer skills for report preparation
- People management
- Communications skills
- Assign priority or sequence to the steps for completing a job
- Coordinate several, competing activities for efficient use of time and material

Industry Job Title	% Job Growth 2022*	Median Wage/Hr
Substation Operations	5%	\$35

Source: Michigan Department of Technology, Management and Budget: Labor Market Information
 *Percentage Job Growth 2022: This number represents the percentage growth rate in the occupation from 2012 to 2022.



Gas Utility Specialist

What will you do?	What competencies will you need? <i>(built on energy foundational competencies – incremental as career advances)</i>
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Note: Most utilities use a pre-employment test – to pass you will need math, communications, problem solving, and mechanical reasoning skills.

STARTING OFF AS A CREW ASSISTANT:

- Provide assistance to crew by providing tools and equipment
- Make work area safe
- Drive equipment to job site

- Teamwork
- Drive heavy commercial vehicles
- Lift 75 lbs
- Listen and follow directions
- Come to work on time and prepared
- Stand for long periods of time
- Math skills including algebra, trigonometry, and geometry

TRAINING COMPONENTS:

- Understand fundamentals of natural gas
- Ability to fuse plastic pipe
- Operate backhoes and other trenching equipment
- Identify components and maintenance of valves
- Assemble and secure pipe
- Identify the necessary steps for the manual or remote opening and/or closing of a valve or other equipment
- Use appropriate equipment to locate gas mains and services

- Demonstrate skills learned in apprenticeship training on the job
- Dig trenches and make work area safe
- Understand the relationship of physical objects to one another in order to visualize how such objects act together

CREW MEMBER:

- Prepare trenches for laying pipes
- Lay pipes for gas lines
- Fuse plastic pipe together
- Install and repair both high and low pressure pipe systems
- Install automatic controls used to regulate gas systems

- Define how the various parts of systems interact (e.g., parts of the distribution systems) and diagnose the effect on the system of changes or malfunctions in its parts
- Solve problems involving limited options by applying common sense understandings such as selecting the correct tool or equipment for a job
- Listen to and understand customer needs
- Estimate the size, length, or quantity of objects, as in selecting the proper wrench for a bolt, or choose the size of fitting required



CREW LEADER:

- Determine schedules and work activities of crew members
- Check for unsafe work conditions
- Communicate effectively with others, including customers, crew members, and supervisors
- Deal with potentially stressful situations

- People management
- Communications skills
- Assign priority or sequence to the steps for completing a job
- Coordinate several, competing activities for efficient use of time and material
- Adapt work procedures or priorities in response to changing or unforeseen requirements or conditions

SUPERVISOR:

- Schedule and oversee work of line crews
- Review crew member performance and provide feedback
- Prepare and manage budgets
- Develop and send reports to management
- Teamwork

- Financial management
- Computer skills for report preparation
- People management
- Communications skills

Industry Job Title	% Job Growth 2022*	Average Utility Wage/Hr
Gas Utility Specialist**	22%	\$21

*Source: Michigan Department of Technology, Management and Budget: Labor Market Information

** Job Title based on entry level positions in gas operations

Institutions that Grant Energy Certificates or Associate Degrees in Michigan

- Alpena Community College-Alpena, Utility Technology Program
www.alpenacc.edu/
- Delta College-University Center, Alternative Energy-Wind Turbine Technology Program
www.delta.edu/
- Ferris State University-Big Rapids, Energy Systems Engineering-Bachelors in Science
www.ferris.edu/
- Gogebic Community College-Ironwood, Electric Line Mechanic: 1 Yr Certificate
<https://www.gogebic.edu/>
- Henry Ford College-Dearborn, Electrical Technology and Renewable Energy Programs
<https://www.hfcc.edu/>
- Jackson College-Jackson, Energy Systems Technology/Management
www.jccmi.edu/
- Kellogg Community College-Battle Creek, Renewable Energy Program
www.kellogg.edu/
- Lake Michigan College-Benton Harbor, Bachelors of Applied Science in Energy Production & Distribution Management and Associates in Industrial Technology, Certificate of Achievement Line Worker
www.lakemichigancollege.edu/
- Lansing Community College-Lansing, Utility Line Worker Program
www.lcc.edu
- Macomb Community College-Warren, Renewable Energy Technology Program
www.macomb.edu/
- MIAT College of Technology-Canton, Energy Technician Program
<http://www.miat.edu/campuses/canton-michigan/>
- Monroe County Community College-Monroe, Nuclear Energy Technology
www.monroecc.edu/
- Northern Michigan University-Marquette, Electrical Line Technician Diploma, Electrical Technology
www.nmu.edu/
- Northwestern Michigan College-Traverse City, Power Plant Operator Program
<https://www.nmc.edu/>
- Oakland Community College-Bloomfield Hills, Gas Line Worker Training
<https://www.oaklandcc.edu/>
- St. Clair County Community College-Port Huron, Renewable and Alternative Energy Program
www.sc4.edu/
- Wayne County Community College District-Detroit, Renewable Energy
www.wcccd.edu/

These photos illustrate students in training.





Get Into Energy was designed and launched by the Center for Energy Workforce Development (CEWD), a non-profit organization. CEWD's goal is to build awareness among

students, parents, teachers, guidance counselors and others about the fantastic career opportunities available in the energy industry.

To learn about the CEWD, visit us at: www.cewd.org

The MEWDC (Michigan Energy Workforce Development Consortium) is an industry led partnership established in 2008 to address current and future workforce issues crucial to building Michigan's Energy Industry. Both Consumers Energy and DTE Energy have partnered with community colleges, technical training institutions and workforce agencies to help educate job seekers, provide information on transferable skills, and assist with achieving certifications.

To learn more about the MEWDC, visit us at: <http://consortia.getintoenergy.com/michigan/>

