



N.E.A.T. Newsflash

New and Emerging Automation & Technology.

YOUR CAREER IN ENERGY

*This is the fifth in a series of N.E.A.T. Newsflashes. N.E.A.T. Newsflashes are produced and distributed throughout the school year to students, parents, teachers, counselors, WorkOne customers, and other interested parties. The N.E.A.T. Newsflashes focus on one business sector each month; providing important labor market information, and directing readers to related educational pathways and resources. N.E.A.T. productions come to you through a partnership with WorkOne Western Indiana, Ivy Tech Community College, and the CTE Directors **servicing Indiana Region 7 -Clay, Parke, Putnam, Sullivan, Vermillion, and Vigo counties.** Publication contact; lisalee@workforcenet.org.*

PICTURE YOURSELF- IN AN ENERGY CAREER



Every day across America people in the Energy field work hard to ensure you have the fuels needed to power the activities of your day, whether you are at school or play. Are you a person who:

- ✓ Likes identifying problems and reviewing related information to develop and evaluate options.
- ✓ Can give full attention to what other people are saying, take time to understand the points being made, ask questions as appropriate, and not interrupt at inappropriate times.
- ✓ Possess the ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- ✓ Can arrange things or actions in a certain order or pattern according to a specific rule.
- ✓ Is pleasant with others and displays a good-natured, cooperative attitude.

Then perhaps a career in energy is right for you! Let's learn more.



CAREERS IN ENERGY

Electrical Power-Line Installers and Repairers Tasks:

- Adhere to safety practices and procedures, such as checking equipment regularly and erecting barriers around work areas.
- Test conductors, according to electrical diagrams and specifications, to identify corresponding conductors and to prevent incorrect connections.
- Open switches or attach grounding devices to remove electrical hazards from disturbed or fallen lines or to facilitate repairs.
- Climb poles or use truck-mounted buckets to access equipment.
- Drive vehicles equipped with tools and materials to job sites.
- Identify defective sectionalizing devices, circuit breakers, fuses, voltage regulators, transformers, switches, relays, or wiring, using wiring diagrams and electrical-testing instruments.
- Install, maintain, and repair electrical distribution and transmission systems, including conduits, cables, wires, and related equipment, such as transformers, circuit breakers, and switches.
- Dig holes, using augers, and set poles, using cranes and power equipment.
- Place insulating or fireproofing materials over conductors and joints.
- Install watt-hour meters and connect service drops between power lines and consumers' facilities.

Education: Results of a recent ONet survey regarding education levels for this occupation were not available.

However, recent basic hiring requirements by Duke Energy for this position are the following:

Basic Requirements

- High school diploma or GED
- Valid driver's license
- Ability to stand a minimum of five to six hours on the ground – maybe in a bucket or line truck or at the top of a distribution pole.
- Ability to sit for a minimum of two to three hours – may be driving a truck or sitting in a manhole or an underground vault.
- Ability to move frequently to unload equipment and to install/maintain/repair equipment.
- Ability to lift up to 75 pounds.
- Ability to push/pull weights up to 75 pounds.
- Ability to frequently climb or use authorized equipment to reach various heights and breadths.
- Ability to frequently and repetitively bend/stoop/squat.
- Ability to differentiate between colors (color vision).
- Manual dexterity to operate small hand tools, turn small knobs, etc.



Electrical Engineers Tasks:

- Prepare technical drawings, specifications of electrical systems, or topographical maps to ensure that installation and operations conform to standards and customer requirements.
- Operate computer-assisted engineering or design software or equipment to perform engineering tasks.
- Confer with engineers, customers, or others to discuss existing or potential engineering projects or products.
- Direct or coordinate manufacturing, construction, installation, maintenance, support, documentation, or testing activities to ensure compliance with specifications, codes, or customer requirements.
- Design, implement, maintain, or improve electrical instruments, equipment, facilities, components, products, or systems for commercial, industrial, or domestic purposes.
- Prepare specifications for purchases of materials or equipment.
- Perform detailed calculations to compute and establish manufacturing, construction, or installation standards or specifications.
- Investigate customer or public complaints, determine nature and extent of problem, and recommend remedial measures.
- Oversee project production efforts to assure projects are completed on time and within budget.
- Plan or implement research methodology or procedures to apply principles of electrical theory to engineering projects.

Education: Results of a recent ONet survey: 73% have a Bachelor's degree. 13% have an Associate's degree. 6% have a Master's degree.

Biofuels Processing Technicians Tasks:

- Calculate, measure, load, or mix refined feedstock used in biofuels production.
- Operate chemical processing equipment for the production of biofuels.
- Operate equipment, such as a centrifuge, to extract biofuels products and secondary by-products or reusable fractions.
- Operate valves, pumps, engines, or generators to control and adjust biofuels production.
- Process refined feedstock with additives in fermentation or reaction process vessels.
- Assess the quality of biofuels additives for reprocessing.
- Calibrate liquid flow devices and meters including fuel, chemical, and water meters.
- Collect biofuels samples and perform routine laboratory tests or analyses to assess biofuels quality.
- Inspect biofuels plant or processing equipment regularly, recording or reporting damage and mechanical problems.
- Measure and monitor raw biofuels feedstock.

Education: Results of a recent ONet survey: 65% of people in this position have a high school degree or equivalent. 24% have a post-secondary certificate. 7% have some college, no degree.



Power Plant Operators Tasks:

- Adjust controls to generate specified electrical power or to regulate the flow of power between generating stations and substations.
- Monitor power plant equipment and indicators to detect evidence of operating problems.
- Control generator output to match the phase, frequency, or voltage of electricity supplied to panels.
- Control or maintain auxiliary equipment, such as pumps, fans, compressors, condensers, feedwater heaters, filters, or chlorinators, to supply water, fuel, lubricants, air, or auxiliary power.
- Control power generating equipment, including boilers, turbines, generators, or reactors, using control boards or semi-automatic equipment.
- Start or stop generators, auxiliary pumping equipment, turbines, or other power plant equipment as necessary.
- Open and close valves and switches in sequence to start or shut down auxiliary units.
- Communicate with systems operators to regulate and coordinate line voltages and transmission loads and frequencies.
- Inspect records or log book entries or communicate with plant personnel to assess equipment operating status.
- Regulate equipment operations and conditions, such as water levels, based on instrument data or from computers.

Education: Results of a recent ONet survey: 74% of people in this position have a high school degree or its equivalent. 21% have a post-secondary certificate. 3% have an Associate's degree.

Solar Energy Installation Managers Tasks-

- Supervise solar installers, technicians, and subcontractors for solar installation projects to ensure compliance with safety standards.
- Estimate materials, equipment, and personnel needed for residential or commercial solar installation projects.
- Prepare solar installation project proposals, quotes, budgets, or schedules.
- Plan and coordinate installations of photovoltaic (PV) solar and solar thermal systems to ensure conformance to codes.
- Monitor work of contractors and subcontractors to ensure projects conform to plans, specifications, schedules, or budgets.
- Assess potential solar installation sites to determine feasibility and design requirements.

- Provide technical assistance to installers, technicians, or other solar professionals in areas such as solar electric systems, solar thermal systems, electrical systems, and mechanical systems.
- Identify means to reduce costs, minimize risks, or increase efficiency of solar installation projects.
- Coordinate or schedule building inspections for solar installation projects.
- Perform start-up of systems for testing or customer implementation.

Education: Results of a recent ONet survey: 36% of people in this position have a Post-secondary certificate. 20% have some college. 16% have an Associate's degree.

SOURCE – O*Net Online

Occupational Outlook

Energy Occupations - Region 7*- Outlook through 2021**

| SOC | Description | 2013 Jobs | 2013 - 2021 Change | 2013 - 2021 % Change | 2013 Avg. Hourly Earnings | 2021 Jobs |
|---------|--|--------------|--------------------------|----------------------------|------------------------------------|--------------|
| 43-5041 | Meter Readers, Utilities | 19 | (3) | (16%) | \$17.04 | 16 |
| 47-1011 | First-Line Supervisors of Construction Trades and Extraction Workers | 223 | 61 | 27% | \$27.60 | 284 |
| 47-2073 | Operating Engineers and Other Construction Equipment Operators | 160 | 53 | 33% | \$20.91 | 213 |
| 47-2111 | Electricians | 470 | (92) | (20%) | \$26.27 | 378 |
| 47-3013 | Helpers--Electricians | 16 | (2) | (13%) | \$14.63 | 14 |
| 49-9012 | Control and Valve Installers and Repairers, Except Mechanical Door | 33 | (2) | (6%) | \$21.92 | 31 |
| 49-9051 | Electrical Power-Line Installers and Repairers | 135 | 45 | 33% | \$26.55 | 180 |
| 49-9052 | Telecommunications Line Installers and Repairers | 59 | 24 | 41% | \$19.60 | 83 |
| 49-9071 | Maintenance and Repair Workers, General | 1,269 | 79 | 6% | \$17.81 | 1,348 |
| 51-4121 | Welders, Cutters, Solderers, and Brazers | 250 | 78 | 31% | \$15.26 | 328 |
| 51-9198 | Helpers--Production Workers | 256 | 71 | 28% | \$12.77 | 327 |
| 51-9199 | Production Workers, All Other | 322 | 36 | 11% | \$14.63 | 358 |
| 53-1021 | First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand | 108 | 17 | 16% | \$21.72 | 125 |
| | | 3,321 | 365 | 11% | \$19.46 | 3,686 |

*Region 7 includes Clay, Parke, Putnam, Sullivan, Vermillion, and Vigo counties.

**Projected job opening numbers do not include openings due to attrition.

CHARTING YOUR COURSE



PVETI ENERGY PROGRAM – PVETI is in the preliminary stages of designing and beginning to offer energy courses in our high schools. We are piloting this year and next at South Vermillion and through some of the agriculture curriculum at Riverton Parke. The hope is to roll out the curriculum at all schools in 2-3 years. Year one will be a basic introduction to all things energy. Years 2 and 3 will include internships and work based learning opportunities for our students in various businesses located throughout Parke and Vermillion Counties. We are also in the process of developing dual credit agreements for this course with Ivy Tech. The current industry need for workers in our region is high.

The new curriculum addresses both the current and emerging skills gap in Region 7 for skilled technicians in the following areas:

- **Electrical Power**. Duke Energy plans to hire 200 linemen and women in Indiana within the next two years. It is estimated that at least 15% of the energy workforce in Indiana is eligible to retire in 2014.
- **Fuels and Propane**. Ceres Solutions, which provides energy products and services from refined fuels to lubricants to propane to clients, anticipates two-thirds of its 370 employees will retire in 15 years. Ceres has three branch locations in Parke and Vermillion Counties and another 22 branches along the western Indiana border.
- **Energy Refinement**. The Vermillion Rise Mega Park, located at the former Newport Chemical Depot in the center of Vermillion County, is working with a large energy manufacturing company to locate a \$2 billion dollar energy refinery on 750 acres of the site creating a need for 250 permanent, high-paying, full-time positions.
- **Wind Energy**. As of January 2013, Indiana had 930 wind turbines generating more than 1500 megawatts of power. The majority of Indiana's turbines are located within 60 miles of Parke and Vermillion Counties. In a 2011 article in the Indianapolis Star, it was reported that the state currently supports between 3,000 to 4,000 workers in the wind energy industry and that number is growing.
- **Solar Energy**. Solar energy resources are slowly growing in Indiana with 55 megawatts (MW) of solar photovoltaic (PV) power generated in 2013.
- **Coal**. Works Council/Economic Growth Region 7 sits at the north end of Indiana's most active surface and below ground coal mines.

1. IVY TECH – WABASH VALLEY CAMPUS (Terre Haute) –

ENERGY TECHNOLOGY

Energy is a fundamental requirement for the sustenance of life, playing key roles in human ecology and in the development of the earth's flora and fauna. Due to continued growth in human population, resulting in greater growth in energy demand, severe problems in the sustainability of needed energy resources could become acute. The Energy Technology program will examine the growth of energy consumption, the sustainability of energy supply, the long-term energy resources available, and the resulting environmental impacts caused on global and local scales. The program is designed to provide a solid foundation in the fundamental design/installation techniques required to work with energy technologies.

The Energy Technology Program is associated with the Indiana Energy Consortium. The Indiana Energy Consortium was formed to promote Indiana jobs in the energy industry and develop a statewide energy technology program to fill the Hoosier energy industry pipeline with energized, educated and skilled individuals. Additional employment information can be gained at the Get Into Energy site.

Mission Statement

Energy sources are becoming increasingly important in the generation, distribution, conversion and control of energy and the conservation of energy is key to utilizing existing power most efficiently. The energy technology program provides broad practical education for those seeking employment and advancement in energy occupation, to emphasize the ability to think critically, and to develop skills in the use of contemporary energy equipment, measuring instruments and technology.

Energy Technology Areas of Emphasis:

- Home Technology Integration/Energy Auditing
- Renewable Energy Systems Technology
- Wind Energy Technology
- Electric Line Technology
- Natural Gas Technology
- Power Plant Technology

Technical Certificates:

Technical Certificate (31 credit hours = 2 semesters)

The Technical Certificate in Energy Technology can be earned on the way to acquiring the Associate of Applied Science degree. Many available jobs require advanced education beyond the high school diploma. Technical Certificate programs provide education in conceptual and technical skills for specific occupations. The program content is designed to develop competency in the comprehension of general

and technical skills. Certificate programs require mastery of basic reading, writing, mathematical and quantitative skills.

| Semester 1 | | | |
|-------------------|--|--|-----------------------|
| ADMF 101 | Key Principles of Advanced Manufacturing | | 3 |
| ENRG 100 | Energy Industry Fundamentals | | 3 |
| INDT 113 | Basic Electricity | | 3 |
| IVYT 101 | First Year Seminar | | 1 |
| MATH 122 | Applied Technical Mathematics | | 3 |
| XXXX XXX | Energy Technology Statewide Elective | | 3 |
| | | | Semester 1: 16 |
| Semester 2 | | | |
| COMM 101 | Fundamentals of Public Speaking | | 3 |
| INDT 103 | Motors and Motor Controls | | 3 |
| INDT 114 | Introductory Welding | | 3 |
| XXXX XXX | Energy Technology Statewide Elective | | 3 |
| XXXX XXX | Energy Technology Statewide Elective | | 3 |
| | | | Semester 2: 15 |
| | | | Total: 31 |

Electives

Your advisor will help you select electives for your program. [Statewide electives](#), [Transfer General Education Core \(TGEC\) electives](#), and Transfer Cluster electives vary by degree.

This course schedule is based on full-time attendance for students who have demonstrated college readiness. Please review our course schedules for [full-time with college prep](#) courses, [part-time](#) and [part-time with college prep](#) courses.

Degrees: Associate of Applied Science (60 credit hours = 4 semesters)

Top 6 Things You Didn't Know About Solar Energy



This article is part of the Energy.gov series highlighting the "[Top Things You Didn't Know About...](#)" series. Be sure to check back for more entries soon.

6. Solar energy is the most abundant energy resource on earth – 173,000 terawatts of solar energy strikes the Earth continuously. That's more than 10,000 times the world's total energy use.
5. The first silicon solar cell, the precursor of all solar-powered devices, was built by Bell Laboratories in 1954. On page one of its April 26, 1954 issue, *The New York Times* proclaimed the milestone, “the beginning of a new era, leading eventually to the realization of one of mankind’s most cherished dreams - - the harnessing of the almost limitless energy of the sun for the uses of civilization.”
4. The space industry was an early adopter of solar technology. In the 1960s the space industry began to use solar technology to provide power aboard space crafts. The Vanguard 1 -- the first artificial earth satellite powered by solar cells -- remains the oldest manmade satellite in orbit – logging more than 6 billion miles.
3. Fast track to today and demand for solar in the United States is at **an all-time high**. In the first quarter of 2012, developers installed 85 percent more solar panels compared to the first quarter of last year. Total U.S. installations may reach 3,300 megawatts this year – putting the country on track to be the fourth largest solar market in the world.
2. As prices continue to fall, solar energy is increasingly becoming an economical energy choice for American homeowners and businesses. Still, the biggest hurdle to affordable solar energy remains the soft costs – like permitting, zoning, and hooking a solar system up to the power grid. On average local permitting and inspection processes add **more than \$2,500** to the total cost of a solar energy system. The Energy Department **SunShot Initiative** works to aggressively drive down these soft costs – making it faster and cheaper for families and businesses to go solar.

1. In California's Mojave Desert, the largest solar energy project in the world is currently under construction. The project relies on a technology known as solar thermal energy. Once the project is complete 350,000 mirrors will reflect light onto boilers. When the water boils, the steam turns a turbine, creating electricity. The project is expected to provide clean, renewable energy for 140,000 homes and is supported by an Energy Department loan guarantee.

Want more solar? [The National Renewable Energy Laboratory](#), [Energy Information Administration](#), and [Solar Energy Technologies Program](#) are all great solar energy resources – for kids and adults alike.