get into energy
WITH THE CENTER FOR ENERGY WORKFORCE DEVELOPMENT

Career Pathway Spotlight

Discover a Career as an Electrical Engineer

Discover your career in energy!

Electrical Engineers play an essential role in developing the power systems that keep our world running — designing the infrastructure that generates, transmits, and delivers electricity across every sector of the economy.

Power Generation & Transmission

Electrical Engineers design the systems that generate and move power at scale — from substations and switchyards to high-voltage transmission lines. Their work keeps the power on for millions of people and ensures the grid operates safely and reliably.

Renewable Energy & Storage Systems

On solar, wind, and battery storage projects, Electrical Engineers translate energy ideas into working systems — designing generation, energy storage systems, and interconnection equipment networks that bring clean power onto the grid.

Grid Modernization & Industrial Electrification

As utilities upgrade aging infrastructure and industries shift to electric operations, Electrical Engineers design the systems that make it possible — from smart grid controls and protection upgrades to EV charging networks and electrified industrial facilities.

CAREER PATH

Start with:

- High school diploma with strong math and science coursework
- Interest in problem-solving, systems design, and technical work

Get Educated:

- Bachelor's degree in Electrical Engineering (BSEE) from an ABET-accredited program
- Engineer in Training (EIT) / Fundamentals of Engineering (FE) exam
- IEEE membership and engagement with professional development resources

Specialize With:

- Professional Engineer (PE) license

Knowledge in:

- Power systems and grid engineering
- Protection & controls (P&C) systems
- Substations and high-voltage systems
- Renewable energy integration
- Energy storage and electrification

OCCUPATIONAL SKILLS

- Design and analyze electrical systems for power generation, transmission, and distribution
- Use engineering software and modeling tools to size and optimize electrical system designs
- Develop protection and control systems that keep equipment and the grid operating safely
- Ensure designs meet applicable codes, standards, and regulatory requirements
- Prepare technical specifications, drawings, and engineering documentation
- Coordinate with utilities, contractors, and agencies throughout project development
- Support equipment selection, procurement, and commissioning from design through construction

BENEFITS

- Competitive professional salary with performance bonuses
- Employer-sponsored health, dental, and vision insurance
- 401(k) or pension retirement plans
- PE exam fees and continuing education support
- Flexible work arrangements and hybrid options at many employers
- Career growth into project management, technical leadership, or consulting

What Might You Do As An Electrical Engineer?

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ENTRY LEVEL
1-4 years

What you will do:

- Develop electrical drawings, one-line diagrams, and equipment schedules under senior engineer supervision
- Perform load flow, short circuit, and arc flash calculations using engineering software
- Support equipment selection and procurement for transformers, switchgear, and motor control center (MCC) panels
- Review contractor submittals and assist with responses to requests for information (RFIs)
- Assist with site visits and field inspections during construction and commissioning
- Maintain engineering documentation and drawing packages for assigned projects

What knowledge, skills and abilities will you need to succeed?

- Foundational knowledge of AC/DC power systems, circuit theory, and electrical machinery
- Proficiency or aptitude with electrical design software (AutoCAD, ETAP, SKM)
- Understanding of NEC, NESC, and applicable IEEE standards
- Strong analytical and problem-solving skills
- Effective written and verbal communication for technical reports and team collaboration
- EIT certification or actively working toward PE licensure

MID- CAREER
5-8 years

What you will do:

- Lead electrical design on renewable energy, substation, or distribution projects from concept through construction documents
- Perform and supervise power systems studies including protection coordination and fault analysis
- Interface directly with clients, utilities, and regulatory agencies on project requirements
- Manage junior engineers and coordinate across multi-discipline design teams
- Review and stamp engineering drawings as a licensed Professional Engineer
- Develop technical specifications, RFP documents, and cost estimates

What knowledge, skills and abilities will you need to succeed?

- Professional Engineer (PE) license
- Advanced proficiency with ETAP, SKM, or equivalent power systems analysis software
- Strong understanding of utility interconnection processes and grid codes
- Ability to manage project scope, schedule, and budget
- Knowledge of protection relay setting philosophy and coordination studies
- Experience with SCADA/ control systems integration and electrical safety programs

EXPERIENCED
8+ years

What you will do:

- Lead multi-disciplinary engineering teams on large-scale energy infrastructure projects
- Set technical standards, review complex designs, and provide quality assurance oversight
- Serve as engineering lead on utility-scale generation, transmission, and grid modernization projects
- Develop and maintain client relationships, contributing to business development and proposal efforts
- Advise on regulatory strategy and utility negotiations for grid interconnection and permitting
- Mentor junior and mid-level engineers and contribute to firm-wide technical standards

What knowledge, skills and abilities will you need to succeed?

- Deep expertise across power systems, protection, substation design, and grid integration
- Leadership in project execution, client management, and cross-functional team coordination
- Business acumen for project proposals, fee development, and client relationships
- Comprehensive knowledge of NERC, FERC, NEC, NESC, and applicable federal regulations
- Strategic thinking for large capital programs and long-term infrastructure planning
- Established reputation as a subject matter expert and technical authority

GET PAID!

Entry Level:
- $77,990 / year*

As You Gain Seniority:
- $97,730 / year*

Later in Your Career:
- 131,420 / year*

*Source: United States Energy & Employment Report (2025). These figures use the 10th, 50th, and 90th percentiles of all workers in the role as a proxy for seniority progression and for consistency with BLS OEWS and the United States Energy & Employment Report. Compensation figures should be used as a guide; actual compensation may vary depending on education, geography, experience, and many other factors.

ENERGY INDUSTRY CAREERS OFFER:

- Excellent salaries
- Opportunities for advancement
- Job growth & stability
- Professional development and training
- Great benefits

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