Electrical Engineer

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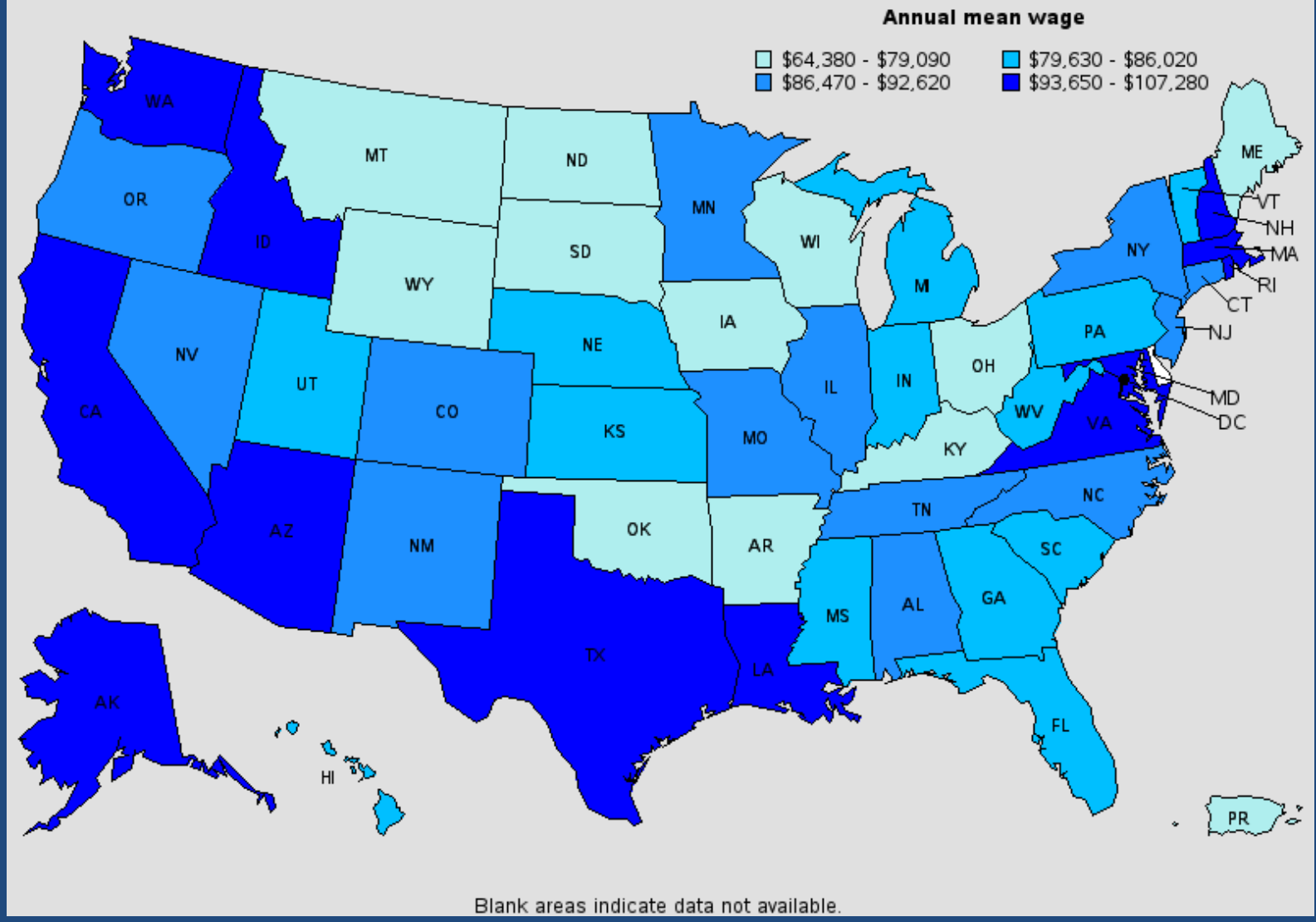
PAY RANGE

- Median annual wage for an electrical engineer is $87,920
  - Hourly pay rate:
    - $43.09
- Median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less
  - The lowest 10 percent earned less than $56,490, and the top 10 percent earned more than $136,690
- Electrical engineer works full-time schedules as well as overtime work when required to meet deadlines
- FUN FACT:
  - Median annual wage for an electrical engineer was in the top five industries in May 2012

Annual mean wage of electrical engineers, by state, May 2012



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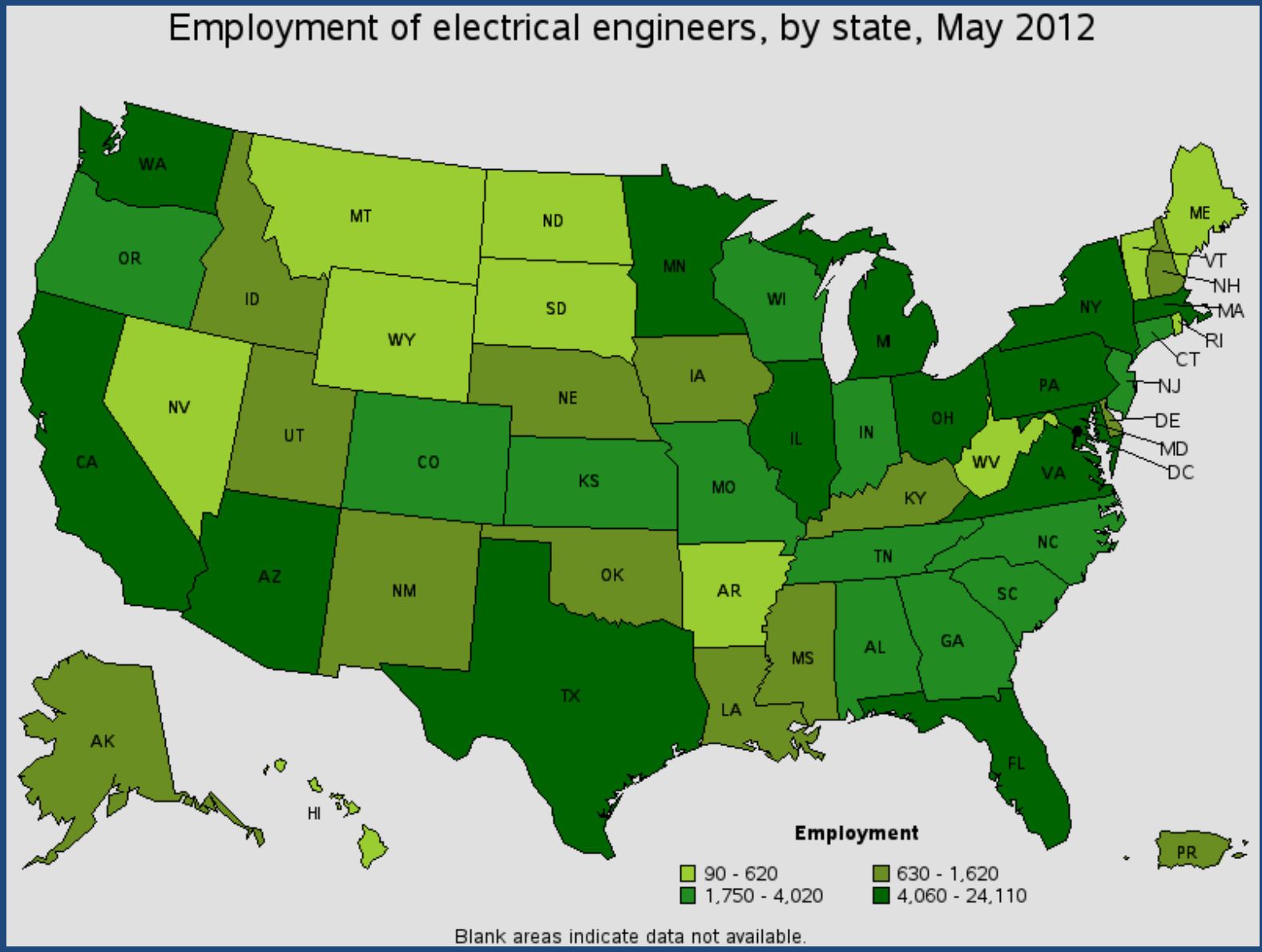
PROJECTED NEED

- Employment is projected to grow 4 percent from 2012 to 2022
  - Slower than the average for all occupations
- With technology changing so will the amount of employees needed
- Job growth in:
  - Computer system design
    - These industries continue to implement more powerful portable computing devices
- Possible contracting instead of employing
  - Help cut cost for majority of the businesses


Employment of electrical engineers, by state, May 2012
WA
OR
CA
NV
ID
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
RI
CT
NJ
DE
MD
DC
AK
HI
PR
Employment
90 - 620
630 - 1,620
1,750 - 4,020
4,060 - 24,110
Blank areas indicate data not available.

Early Inventors of Electricity

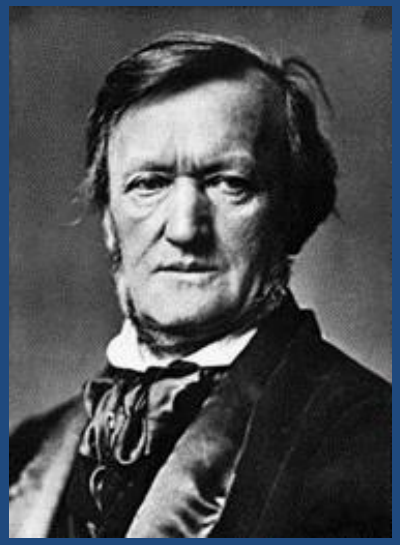
William Gilbert - 1600

-First coined the terms electricity, magnetic poles, electric force, and electric attraction.

-He also wrote about the electrification of many substances.

- Otto von Guericke – 1660
- -Invented the first electric generator which produced static electricity

Stephen Gray - 1675
-discovered the conduction of electricity
-classified materials as conductors and insulators

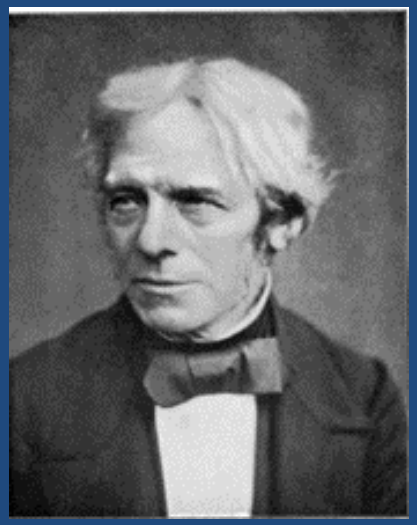


Georg von Kleist - 1745
-discovered electricity was controllable
-invented one of the first capacitors

William Watson - 1747
-began the comprehension of current and circuit
-proposed the idea of positive and negative charges

Benjamin Franklin - 1752
-proved that lightening was electricity, invented the lightening rod
-proposed the idea on an electrical ground
-also worked to prove the existence of positive and negative charges

- Alessandro Volta - 1800
- -invented the first battery
- -proved that electricity could travel over wires



Michael Faraday - 1820
-Invented the first electric motor

Georg Simon Ohm - 1826
-invented Ohms Law, a conduction law that relates potential, current, and circuit resistance

Thomas Edison - 1879
-invented the incandescent light bulb and phonograph
-founded the Edison Illumination Company

Nikola Tesla - 1888
-Invented the Polyphase Alternating Current System

Future Electrical Inventions

- Many of the new inventions today in the field of electricity center on new renewable ways to create electricity. Another core focus is on improving the efficiency of existing products.

Thermo-Chemical Solar Power

- Researchers at MIT are currently working on perfecting a system of Thermo-Chemical Solar Power. This system has the potential to increase the efficiency of solar power from 33% to over 80%. It accomplished this by placing a two layer absorber-emitter device between the solar rays and the photovoltaic cell on a solar panel. This device absorbs light on a bandwidth that is not normally absorbed by photovoltaic cells and heats up. When it has heated up, it emits light at a bandwidth that can be absorbed by the photovoltaic cell.

Using Ocean Waves to Generate Electricity

There new prototype machines being tested now that can use the power of ocean waves to generate electricity. There are many variations of this type of machine being tested around the world. Most of them work by harnessing the power of ocean waves to power a turbine.

Using Waste Heat to Generate Electricity In an Industrial Setting.

Innovations such as this, Ener-G Rotors' Gen 4 System. This system capitalizes on the waste heat produced in industrial buildings and uses it to produce electricity. It does so by using heat that has been generated as a result of an industrial process , that would normally be considered waste, to heat water to its boiling point causing steam, this steam then drive a turbine and produces electricity.

The electric car is something that electrical engineers have been heavily involved with and will continue to be involved with.

Educational Requirement to become an Electrical Engineer

- Education requirements for electrical engineers differ depending on the level of position being sought as well as the employer. However, electrical engineers usually need a four-year bachelor's degree in this field through a college or university. Students in these programs usually can choose a concentration such as microwave engineering or power systems and get experience with both theory and design/lab work.

Educational Requirement to become an Electrical Engineer cont.

- In addition, a two-year master's degree can be helpful for those who want to advance to management roles in the electrical engineering field. Master's degree programs usually focus on a particular specialty such as electronics or digital systems and allow students to complete research. Doctoral degrees are designed for those interested in university teaching or high-level industrial research. Many colleges offer electrical engineering degrees online as well. The Accreditation Board for Engineering and Technology accredits electrical engineering programs, according to CollegeBoard.com.

Educational Requirement to become an Electrical Engineer cont.

- Courses in an electrical engineering training program might include computer programming, engineering economy, electrical circuits, thermodynamics, numerical analysis and engineering materials. Other required courses might cover calculus, technical writing and engine/machinery technologies, according to DiplomaGuide.com. In addition, students might study integrated circuits, which are a major part of the entertainment and consumer appliance industries. Students additionally can learn about robotics, power systems and communication systems. Math and physics are at the heart of these programs.

A Day In the life of an Electrical Engineer

- -Work out designs
- -develop electrical equipment
- - Work place: Inside, Outside, A desk Job
- -work hours typically 8-12hrs shifts

Bibliography

- U.S. Bureau of Labor Statistics. "Electrical and Electronics Engineers." United States Department of Labor. U.S. Bureau of Labor Statistics, 8 Jan. 2014. Web. 20 Jan. 2014.