



ENERGY FUTURES
— INITIATIVE —

2018 U.S. Energy and Employment Report

*A Joint Project of the Energy Futures Initiative
and the National Association of State Energy
Officials*

NASEO Public Policy Conference
February 9, 2018
Washington, DC

The USEER addresses three gaps in current QCEW Bureau of Labor Statistics (BLS) energy employment data:

1. Business activities essential to the operation of traditional energy companies, but classified in other economic sectors.
 - Full-time contractor maintenance workers at nuclear plants classified as construction workers.
2. Renewable energy jobs such as wind, solar, geothermal, etc.;
 - Residential PV installers, classified as construction electricians or roofers.
3. Energy efficiency jobs;
 - No differentiation between employees producing or installing high efficiency, Energy Star and non-Energy Star products.

Analyzed Sectors

Electrical Power Generation and
Fuels Production

Transmission, Distribution,
and Storage

Energy Efficiency

Motor Vehicles

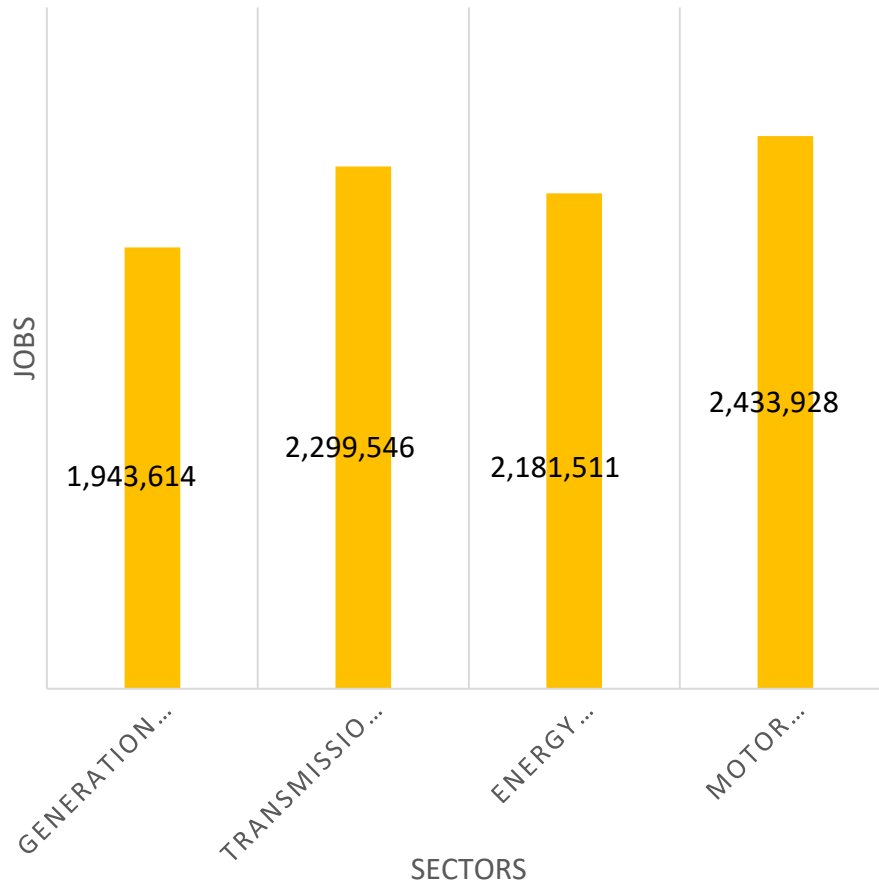
The USEER addresses three of the gaps in energy and employment data through a supplemental survey:

- Identified 382,500 establishments with possible energy-related employment.
- Surveyed a representative sample of 30,000 businesses.
- Analyzed four sectors



The US Energy and Employment Report

ANALYZED EMPLOYMENT SECTORS: 4TH Q, 2016



- In total, 4.24 million Americans work in traditional energy industries
 - 1.45 million additional jobs were identified
- Electric Power Generation and Fuels Production directly employ 1.9 million workers,
 - Double the 930,000 covered in the QCEW-BLS direct industry classifications.
- 2.3 million Americans work in Transmission, Distribution, and Storage
 - 450,000 additional jobs
- 2.2 million work in Energy Efficiency
- 259,000 work with alternative fuels vehicles

2018 USEER—An EFI/NASEO Partnership

- MOU signed in November, 2017
- Fundraising, nearly completed
- Data gathering completed, 27,000+ businesses surveyed
- Data analysis underway, partially completed
- Release planned for April, 2018
- Transition to subscription model in 2019

2017--Some Examples of Undercounting

Electric Power Generation: National

Fuel Source	QCEW-BLS	USEER
Fossil fuels	92,817	187,117
Nuclear	44,753	68,176
Wind	6,050	101,738
Solar	2,708	260,077
CHP	1,649	18,034
Hydro	17,501	65,554
Geothermal	1,117	5,768
Biomass	1,693	26,014

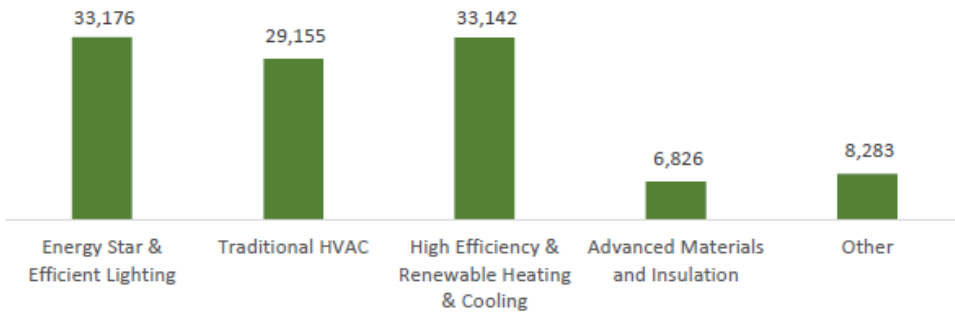
Electric Power Generation: New York

Fuel Source	QCEW-BLS	USEER
Fossil fuels	2,080	5,030
Nuclear	2,991	n/a
Wind	97	2,855
Solar	61	12,411
CHP	n/a	n/a
Hydro	1,045	5,859
Geothermal	n/a	n/a
Biomass	n/a	3,325

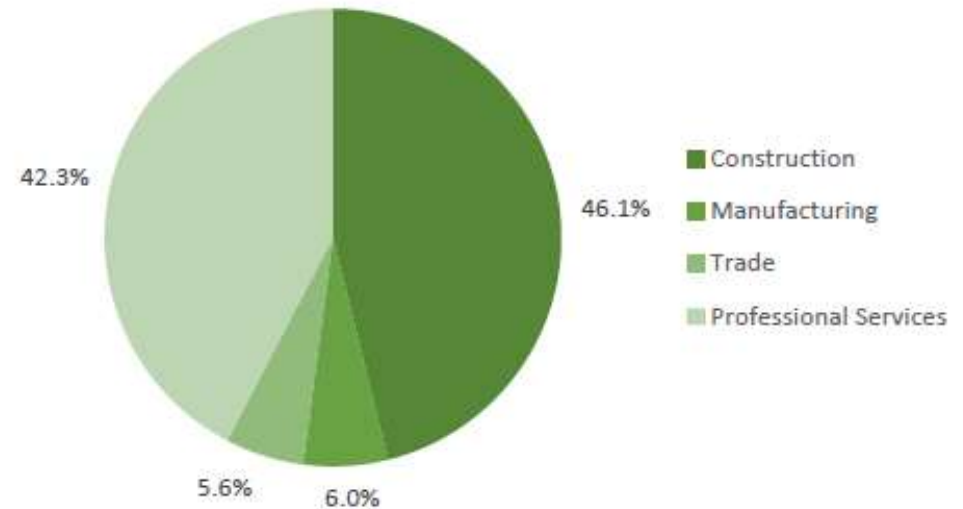
N.Y. State Profile of Energy Efficiency Jobs

In 2017 New York had 110,582 jobs in Energy Efficiency

By Technology



By Sector



Technology	Very difficult	Somewhat difficult	Not at all difficult	DK/NA
Energy Efficiency	23.4%	50.4%	23.4%	2.8%

Energy Workforce Challenges and Opportunities

- **73% of all surveyed employers reported difficulty hiring qualified workers over the last 12 months (in 2016); 26% noted it was very difficult**
- **Employer projected hiring rates for 2017:**
 - **Energy Efficiency—9% growth or 198,000 jobs**
 - **Transmission, Wholesale Distribution and Storage—6% growth or 78,000 jobs**
 - **Solar—7% or 18,200 jobs**
 - **Wind—4% or 4,100 jobs**
 - **Fuels—2% decline projected for 2017**
 - **Motor Vehicles—3.4% growth or 81,000 jobs**, but all in wholesale trade, professional services, and maintenance.
- **The energy-related sectors are less diverse than the workforce as a whole.**
 - 14% Latino or Hispanic compared to 16% overall.
 - 8% Black or African-American compared to 12% overall.
- **Women make up from 22-34%** of these sectors compared to 47% of the overall workforce. Electric Power Generation employs the highest percentage of women.
- **Veterans comprise about 10%** of employees, compared to 7% nationally.



The U.S. Energy and Employment Report

Key Facts: Growth and Decline in Key Energy Sectors

Type (jobs in thousands)	Employment 1/09 in 000's	Peak in 000's	Current in 000's	Loss/Growth in 000's	Loss/Growth in 000's from high	
Coal mining*	86.4	89.8 July, 2012	53.7	(32.7)	(36.1)	74,000-2017 USEER
Oil and Gas Extraction*	165.1	200.9 Oct., 2014	173.4	8.3	(27.5)	563,916-2017 USEER
Oil and Gas Support Services*	218.4	340.0 Sept., 2014	215.3	(3.1)	(124.7)	
Utilities*	562.1	568.5 June, 2016	565.2	3.1	3.1	
Solar**	93.5	260.0	260.0	166.5	166.5	
TDS*** (Infrastructure)	N.A.	N.A.	1249	65	65	
Energy Efficiency Products and Services***	N.A.	N.A.	2200	133	133	

EMPLOYMENT & WORKFORCE

- Technology & Sub-Technology
- Industry & Occupation
- Past & Projected Growth
- Education & Demographics
- Hiring Difficulty

GEOGRAPHY

- State
- County
- Congressional District
- State Legislative Districts
- MSA

Electric Power Generation Technologies

1. Solar Photovoltaic & Concentrated Solar
2. Wind
3. Geothermal
4. Bioenergy/ Biomass
5. Low-Impact & Traditional Hydroelectric
6. Advanced/ Low Emission Natural Gas
7. Nuclear
8. Coal
9. Petroleum/ Oil
10. Natural Gas
11. Combined Heat & Power

Fuels Production Types

1. Coal
2. Petroleum
3. Natural Gas
4. Other Fossil Fuels
5. Corn Ethanol
6. Other Ethanol/ Non-Woody Biomass
7. Woody Biomass/ Cellulosic Biofuel
8. Other Biofuels
9. Nuclear Fuels

Transmission, Distribution, and Storage

1. Traditional Transmission & Distribution
2. Pumped Hydro Storage
3. Battery Storage
4. Other Storage
5. Smart Grid
6. Microgrids
7. Other Grid Modernization

Energy Efficiency Technologies

1. ENERGY STAR Appliances
2. Efficient Lighting (LED, CFL, etc.)
3. Traditional HVAC
4. ENERGY STAR/ High Efficiency Heating & Cooling
5. Renewable Heating & Cooling
6. Advanced Building Materials
7. Recycled Building Materials
8. Reduced H₂O Consumption



Motor Vehicles

1. Gasoline & Diesel Motor Vehicles
2. Hybrid Electric
3. Plug-In Hybrid
4. Electric
5. Natural Gas
6. Hydrogen
7. Fuel Cell
8. Contribute to CAFÉ standards

2017 Energy Workforce Challenges

- **Size and complexity of energy systems** is disguised by new business models and technology shifts
 - USEER identified 1.45 million additional jobs that are essential to our traditional energy production, transmission, distribution and storage systems.
- **Hiring difficulty** across all surveyed sectors
 - Underscores the importance of coordinating resources for energy planning, economic development and workforce training.
- **Construction industry skills** and training systems are central to our energy security and resilience.
 - Energy and energy efficiency jobs are now 32% of construction workforce or 2.1M employees.
- **Diversity**—less diversity than workforce as a whole, warrants a sustained initiative to remove barriers to entry.

A Look Forward to 2018 in Solar

- Earlier this week The Solar Foundation released its 2018 report (2017 jobs numbers), based on the same survey methodology.
- It showed:
 - 3.8% decline in solar jobs nationally
 - Concentrated in three states—California, Massachusetts, Nevada
 - Job increases in 29 other states
- Highlights the importance of understanding the impacts of:
 - Policy changes
 - Cost declines
 - Regulatory activity
 - Trade rules and enforcement

EFI/NASEO Partnership

- Energy production, distribution and use relies on an integrated system across many technologies. We need to know the jobs' impacts in an integrated fashion as well.
- We look forward to working together!