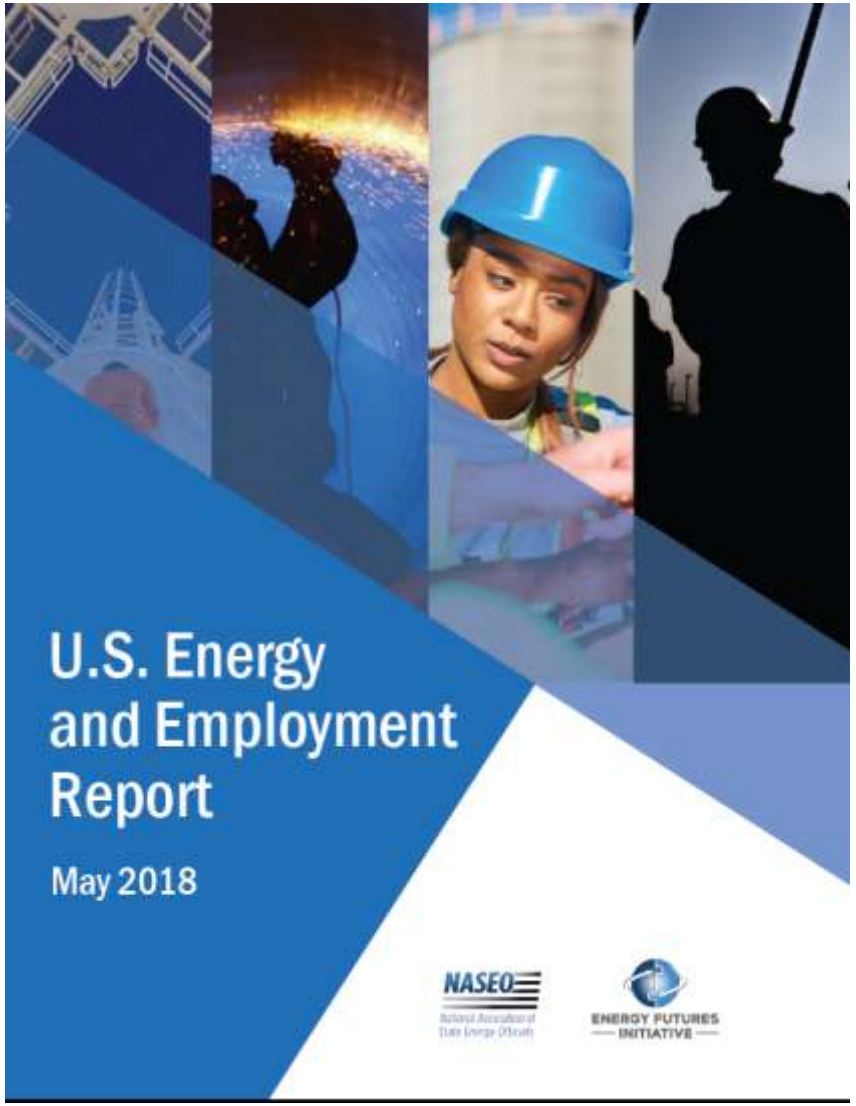
2019 Energy Employment Trends



Presentation for:

National Association of State Energy Officials

Washington, D.C.

February 8, 2019

--David Foster
Energy Futures Initiative

Solar Electric Power Generation—BLS Q3

- U.S. solar jobs, QCEW, Q3, 2017—2,848.
- North Carolina, solar jobs, QCEW, Q3, 2017—163.
- 2017 USEER, U.S. solar jobs—349,725 (250,271 more than 50%.)
- 2017 USEER N.C. solar jobs—9,173 (7,622 more than 50%.)

Private, NAICS 221114 Solar electric power generation, All States and U.S. 2017 Third Quarter, All establishment sizes Source: Quarterly Census of Employment and Wages - Bur...

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Quarterly Census of Employment and Wages

Private, NAICS 221114 Solar electric power generation, All States and U.S.
2017 Third Quarter, All establishment sizes
Source: Quarterly Census of Employment and Wages - Bureau of Labor Statistics

Download Source Data | Build Another Table

State	Quarterly Establishments	July Employment	August Employment	September Employment	Total Quarterly Wages	Average Weekly Wage	September Employment Location Quotient	Total Quarterly Wages Location Quotient
U.S. TOTAL	281	2,835	2,879	2,848	$71,773,574	$1,934	1.00	1.00
Arizona	11	383	406	390	9,745,588	1,908	7.17	7.76
California	52	606	614	609	19,200,736	2,423	1.80	1.90
Colorado	7	150	157	157	4,166,883	2,072	3.03	3.03
District of Columbia	3	5	5	5	209,016	3,216	0.33	0.32
Florida	31	241	241	214	4,770,021	1,582	1.31	1.30
Georgia	7	15	12	15	254,116	1,396	0.18	0.12
Hawaii	7	121	124	122	1,796,525	1,130	9.46	5.95
Illinois	12	20	23	21	469,584	1,693	0.18	0.15
Massachusetts	19	86	90	79	1,524,222	1,379	1.12	0.69
Michigan	4	4	3	3	47,837	1,104	0.04	0.02
New Jersey	16	118	118	132	2,711,498	1,700	1.66	1.21
New Mexico	7	82	86	87	1,380,898	1,250	5.41	4.24
New York	16	80	70	78	3,747,391	3,793	0.42	0.68
North Carolina	15	160	157	163	3,117,744	1,499	1.90	1.63
Ohio	3	38	39	38	1,347,404	2,704	0.36	0.56
South Carolina	10	69	66	71	1,051,640	1,178	1.77	1.28
Texas	10	138	141	141	4,003,433	2,200	0.60	0.66
Utah	12	106	112	107	5,033,013	3,574	3.76	8.16
Virginia	7	13	17	17	215,182	1,057	0.22	0.11

Footnotes:
This table excludes rows with suppressed employment and wages

How Do We Define "Energy Jobs"?

- The Problems:
  1. The North American Industrial Classification System (NAICS) does not have a single comprehensive category for "energy jobs", defined as "jobs that are essential to the production, transmission, distribution, and storage of energy."
  2. NAICS also does not have a definition for jobs whose primary purpose is to make energy use more efficient.
- The DOE Solutions:
  1. Design a supplemental employer survey of the 186 NAICS codes that contain all or some portion of the jobs "essential to produce, transmit, distribute and store energy."
  2. Create a credible definition of jobs in energy efficiency and survey the relevant employers.

How Is the USEER Survey Administered?

- A national supplemental survey that tracks existing BLS QCEW data
  - QCEW is compiled from unemployment records collected at the state level and then aggregated into 1,057 industry sectors using the North American Industrial Classification System (NAICS)
- The survey is administered to a representative sample of 30,000 employers by phone and internet out of a data base of 380,000 employers. Results are integrated with QCEW data.
- Analyzes five sectors:
  1. Fuels Production
  2. Electric Power Generation
  3. Transmission, Distribution and Storage of Electricity and Fuels
  4. Energy Efficiency
  5. Motor Vehicles

2018--Some Examples of Undercounting

Electric Power Generation: National

Fuel Source	QCEW-BLS	2018 USEER
Fossil fuels	92,817	212,669
Nuclear	44,753	64,743
Wind	6,050	107,444
Solar	2,848	349,725 (250,271)
CHP	1,649	27,239
Hydro	17,501	66,872
Geothermal	1,117	7,927
Biomass	1,693	12,385

Electric Power Generation: North Carolina

Fuel Source	QCEW-BLS	2018 USEER
Fossil fuels	n/a*	5,324
Nuclear	n/a*	1,697
Wind	n/a*	759
Solar	163	9,173 (7,622)
CHP	n/a*	n/a
Hydro	60	551
Geothermal	n/a*	344
Biomass	61	1,528

*The federal government is required to suppress data when it would reveal an employer's identity.

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The USEER Definition of Energy Efficiency

- Based on the EPA ENERGY STAR program and includes:
  - Energy Star Appliances
  - LED, CFL and Other Efficient Lighting
  - Traditional HVAC goods, control systems, and services
  - Energy Star/ High Efficiency heating and cooling equipment, including boilers and furnaces with an AFUE rating of 90 or greater and air and central air conditioning units of 15 SEER or greater.
  - Solar thermal water heating and cooling
  - Other renewable heating and cooling (geothermal, biomass, heat pumps, etc.)
  - Advanced Building Materials/Insulation
  - Recycled building materials
  - Reduced water consumption products and appliances
  - Other (Specify)

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USEER Technologies

Electric Power Gen.	Fuels Production	Trans, Dist., Storage	Energy Efficiency	Motor Vehicles
Solar Photovoltaics	Coal	Traditional T & D	Energy Star Applian.	Gasoline & Diesel
Wind	Petroleum	Pumped Hydro	Efficient Lighting	Hybrid Electric
Geothermal	Natural Gas	Battery Storage	Traditional HVAC	Plug-in Hybrid
Bioenergy/Biomass	Other Fossil Fuels	Other Storage	Energy Star HVAC	All Electric
Low Impact Hydro	Corn Ethanol	Smart Grid	Renewable HVAC	Natural Gas
Traditional Hydro	Non-woody Biomass	Micro Grids	Adv. Build. Materials	Hydrogen
Natural Gas	Woody Biomass	Other Modernizing	Recycled Build. Mat.	Fuel Cell
Advanced Gas	Other Biofuels		Reduced H20	
Nuclear	Nuclear Fuels		Solar thermal	
Coal			Other	
Petroleum/Oil				
CHP				

USEER Content

- The employer survey covers direct employment in 53 different energy, energy efficiency and motor vehicle technologies across 186 NAICS codes located in seven broad industrial classifications.

- The survey determines:
  - Employment numbers
  - Employer hiring expectations for the next 12 months
  - Hiring difficulty by technology and industrial classification
  - High demand jobs and skills gaps
  - Workforce demographics by race, ethnicity, gender, and veteran's status
  - Geographic location by state, county, congressional and legislative districts, and MSA of each technology and industrial classifications

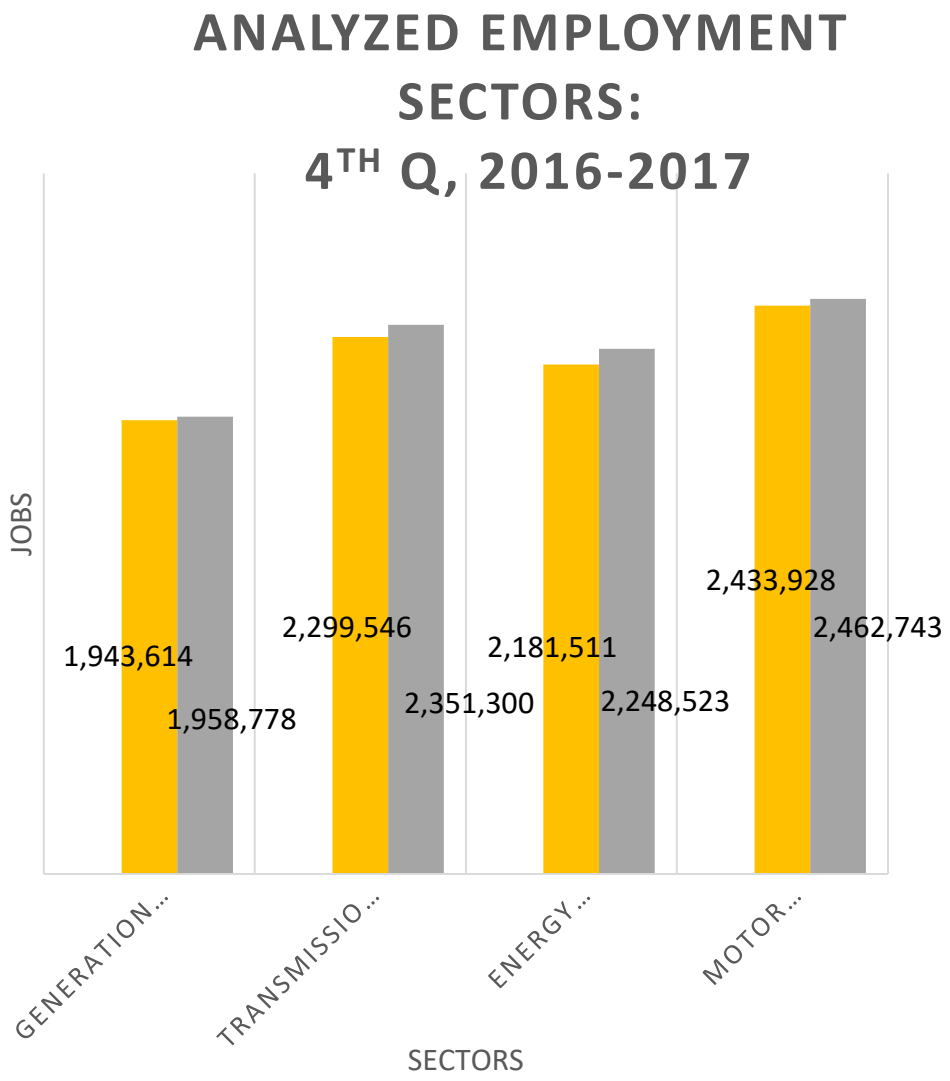
USEER NAICS Industry Classifications

- Agriculture—NAICS 11
- Mining, Oil and Gas Extraction—NAICS 21
- Utilities—NAICS 22
- Construction—NAICS 23
- Manufacturing—NAICS 31-33
- Wholesale Trade—NAICS 42
- Professional and Technical Services—NAICS 54

Next Steps for USEER Data

- Wage Data for 2019
  - Surveyed across 85 different occupational codes such as electrician, construction laborer, architect, engineer, front line supervisor, etc.
  - Provide a comparative wage and benefit analysis across different energy and energy efficiency technologies.
- Analytical Projects—Minneapolis Example
  - What are the job impacts and opportunities of the City's clean energy initiative to make all city buildings and operations 100% reliant on renewable electricity by 2022 and the city as a whole by 2030?
  - Map existing renewable energy and energy efficiency jobs in the city and 7-county MSA based on USEER data, analyze USEER hiring data, identify high demand occupations, and provide opportunity targets for employment training programs in disadvantaged communities, and evaluate best practices for economic and workforce development in clean energy.

2018 US Energy and Employment Report



*Traditional Energy sectors include Electric Power Generation and Fuels Production and Transmission, Distribution and Storage.

162,000 New Jobs in 2017 in 4 Sectors

- Traditional Energy and Energy Efficiency add 133,000 jobs in 2017, continuing to outperform the overall economy.
  - Energy Efficiency led the way with 67,000 new jobs.
- Natural gas electric generation added 19,000 new jobs.
- Overall hiring difficulty declined slightly to 70%
  - But in key growth sectors such as EE construction jobs, worsened, climbing to over 83% difficulty.
- Overall Traditional Energy and Energy Efficiency employers predicted 6.1% growth rate for 2018.
- Solar jobs declined for first time since 2010, but wind, CHP, biomass, geothermal and low impact hydro all grow.
- Motor vehicles added 29,000 jobs, but alternative fuel vehicle jobs declined by almost 40,000, in spite of 25% increase in hybrid, plug-in, and electric vehicle sales.

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Energy Efficiency Jobs in 2017

- **2.25 million people** work, in whole or part, with Energy Efficiency technologies, a net increase of 67,000.*
  - 1.274 million of these jobs are in construction, a decline of almost 100K.
    - However, the intensity of energy efficiency construction businesses has increased with 80.3% reporting that their employees now spend the majority of their time working with these technologies, up from 74% in 2016.
    - As a result, 1,024,000 construction employees spend a majority of their time on EE than in 2016, an increase of 6,500.
  - 450,000 Americans are employed in Energy Efficiency business and professional services, an increase of 63K.
  - 315,000 Americans manufacture Energy Star products, an increase of 26K.

*This number does not include jobs in retail trade, such as hardware stores, big box appliance stores, etc.

ENERGY FUTURES INITIATIVE

Key Trends to Watch in 2019

Will the energy sector continue to outperform the rest of the economy?

Fuels

- In 2017 jobs in coal mining and coal fired power plants stabilized. **Will that continue?**
- After steep losses in oil and gas extraction in 2015-16, oil and gas jobs also stabilized in 2017. **Can this continue in 2018-19 in spite of price volatility?**
- **What is the future of biofuels?**

Electric Power Generation

- Solar jobs declined in 2017 by 6%, albeit confined to three states. **Will solar bounce back?**
- Natural gas is now the dominant fuel for generation, adding 19,000 jobs in 2017. **Will new generation jobs continue to shoot up in gas at the expense of coal and nuclear?**

Key Trends to Watch in 2019

Will the energy sector continue to outperform the rest of the economy?

Transmission, Distribution, and Storage

- TDS jobs have grown in construction, primarily as a result of utility investments. The number of construction firms reporting the majority of revenues from utility-funded investments rose by 6.5 percentage points to 38% in 2017. **Will there be a pause or will this continue?**
- Storage also grew rapidly in 2017. **Will this key technology to the continued growth of renewables keep its torrid growth path?**

Energy Efficiency

- Energy Efficiency job growth has been on a tear, adding 200,000 new jobs in the last two years. **Will job growth and the continued adoption of these technologies intensify?**
- **Will hiring difficulties lessen in the construction industry where 83% reported difficulty?**

Key Trends to Watch in 2019

Will the energy sector continue to outperform the rest of the economy?

Motor Vehicles

- Alternative fuels' vehicles jobs declined by 15%, in spite of an increase of sales by 25%. **With controversy over the future of CAFÉ standards will this trend continue?**

2018 USEER

Thank you!

Questions?

To download the USEER go to www.usenergyjobs.org

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