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  • Alyse Taylor-Anyikire, PhD, Senior Policy Analyst, NGA

• Speakers:
  • David Foster, Distinguished Associate, Energy Futures Initiative

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

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National Governors Association
Energy Policy Institute

David Foster, EFI, Distinguished Associate Chief Author, USEER
• U.S. solar jobs, Q3, 2017—2,848.
• North Carolina—Q3, 2017—163.
• 2017 U.S. solar jobs—349,725 (250,271 more than 50%).
• 2017 N.C. solar jobs—9,173 (7,622 more than 50%).
• The USEER is based on an annual supplemental employer survey, integrated with the BLS Quarterly Census on Employment and Wages.

• It studies employment in the following sectors:
  - Fuels
  - Electric Power Generation (EPG)
  - Transmission, Distribution, and Storage (TDS)
  - Energy Efficiency (EE)
  - Motor Vehicles

• Fuels, EPG, and TDS make up the Traditional Energy Sector.
• The 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
### Electric Power Generation: National

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

### Electric Power Generation: North Carolina

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

*The federal government is required to suppress data when it would reveal an employer’s identity.*
• “Energy Efficiency employment covers both the production and installation of energy-saving products and the provision of services that reduce end-use energy consumption. These jobs, as specified in the current survey, include the manufacture of ENERGY STAR®-labeled products, as well as building design and contracting services that provide insulation, improve natural lighting, and reduce overall energy consumption across homes and businesses.”

• Does not include energy efficiency employment in manufacturing processes.

• Includes CHP and waste heat to power, but in EPG numbers.
• Total US energy expenditures peaked in 2005 at $1.6 Trillion and have now fallen by 37% or $600B.
• Energy has fallen from 14% of US GDP in 1980 to 5.6% in 2016.
• Meanwhile US GDP has grown by 665%. 
Mountain Region, 9.5
Largest %: Coal, 40.8
2nd Largest %: N. Gas, 28.5
Non-Hydro Renewables: 12.6% (7.2, 4.0)

Pacific Contiguous Region, 13.8
Largest %: Hydro, 38.1
2nd Largest %: N. Gas, 31.7
Non-Hydro Renewables: 20.2% (7.4, 7.3)

Pacific Non-Contiguous, 25.5
Largest %: Petroleum Liquids, 45.6
2nd Largest %: Natural Gas, 19.6
Non-Hydro Renewables: 9.6% (4.2, 1.3)

W. South Central Region, 8.4
Largest %: Natural Gas, 49.3
2nd Largest %: Coal, 23
Non-Hydro Renewables: 15.4% (14.1, 0.5)

W. North Central Region, 9.8
Largest %: Coal, 52.6
2nd Largest %: Wind, 20
Non-Hydro Renewables: 22.1% (21, 0)

E. North Central Region, 10.1
Largest %: Coal, 44.8
2nd Largest %: Nuclear, 25.8
Non-Hydro Renewables: 5.5% (4.5, 0.1)

E. South Central Region, 9.3
Largest %: Natural Gas, 36.4
2nd Largest %: Nuclear, 22.4
Non-Hydro Renewables: 2.0% (0, 0)

South Atlantic Region, 9.9
Largest %: Natural Gas, 44.2
2nd Largest %: Nuclear, 24.7
Non-Hydro Renewables: 4.4% (0.3, 1.7)

New England Region, 17.5
Largest %: Natural Gas, 48
2nd Largest %: Nuclear, 29.7
Non-Hydro Renewables: 11.3% (3.5, 1.5)

Mid-Atlantic Region, 12.6
Largest %: Natural Gas, 39.1
2nd Largest %: Nuclear, 37.3
Non-Hydro Renewables: 3.6% (1.9, 0.3)

Source: EIA Website, accessed 060119
Data are for 2018
% Wind % Solar
Avg. retail electricity price, cents/kwh
2019 Key Takeaways

226,000 New Jobs in 2018 in 5 Sectors

- Traditional Energy and Energy Efficiency added 152,000 jobs in 2018, out performing the economy for the 4th year in a row by 0.5 percentage point, 2.3% to 1.8%.
- Fuels production added 52,000 new jobs, 33,000 in oil and 17,000 in natural gas, while coal mining held firm.
- Generation declined by 8,000 jobs with coal, solar, and nuclear declining, partially offset by natural gas, wind, CHP, and geothermal
- TDS added 33,000 new jobs, concentrated in utility projects and storage.
- Energy efficiency added 76,000 jobs; 275,000 in last 3 years
- Motor vehicles added 74,000 jobs, while alternative fuel vehicles bounced back, adding almost 34,000 jobs.
### Energy Efficiency Jobs by Technology & Industry--2018

#### Overview

- Construction is the largest industry sector of EE at 55.7%.
- Professional Services is second at 20.8%.
- Manufacturing is third at 13.8%
- The largest technology is Traditional HVAC at 25.0%
- EnergyStar/High efficiency HVAC is second at 18.4%.
- LED, CFL, and other efficient lighting is third at 15.9%.

#### Table 44.
**Energy Efficiency Sector – Employment by Detailed Technology**
Application and Industry, Q2 2018

<table>
<thead>
<tr>
<th>Technology</th>
<th>Total</th>
<th>Construction</th>
<th>Manufacturing</th>
<th>Wholesale Trade</th>
<th>Professional Services</th>
<th>Other Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR Appliances</td>
<td>167,928</td>
<td>88,567</td>
<td>17,893</td>
<td>12,852</td>
<td>58,677</td>
<td>4,008</td>
</tr>
<tr>
<td>LED, CFL and Other Efficient Lighting</td>
<td>370,562</td>
<td>184,371</td>
<td>69,838</td>
<td>39,266</td>
<td>98,817</td>
<td>3,177</td>
</tr>
<tr>
<td>Traditional HVAC, goods, control systems, and services</td>
<td>582,108</td>
<td>322,181</td>
<td>33,023</td>
<td>54,354</td>
<td>156,325</td>
<td>16,224</td>
</tr>
<tr>
<td>ENERGY STAR/High Efficiency heating and cooling equipment</td>
<td>427,928</td>
<td>275,285</td>
<td>74,791</td>
<td>26,536</td>
<td>49,421</td>
<td>4,444</td>
</tr>
<tr>
<td>Renewable Heating and Cooling (including Solar Thermal)</td>
<td>138,898</td>
<td>82,513</td>
<td>7,823</td>
<td>7,864</td>
<td>29,909</td>
<td>2,885</td>
</tr>
<tr>
<td>Advanced Building Materials/Insulation</td>
<td>357,705</td>
<td>264,245</td>
<td>74,377</td>
<td>22,462</td>
<td>54,297</td>
<td>2,304</td>
</tr>
<tr>
<td>Recycled building materials</td>
<td>82,423</td>
<td>46,921</td>
<td>11,844</td>
<td>2,201</td>
<td>17,649</td>
<td>3,007</td>
</tr>
<tr>
<td>Reduced water consumption products and appliances</td>
<td>91,555</td>
<td>50,069</td>
<td>6,109</td>
<td>5,291</td>
<td>20,728</td>
<td>1,358</td>
</tr>
<tr>
<td>Other</td>
<td>116,225</td>
<td>35,550</td>
<td>46,856</td>
<td>9,086</td>
<td>18,379</td>
<td>6,354</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,324,865</td>
<td>1,295,702</td>
<td>321,581</td>
<td>180,309</td>
<td>484,481</td>
<td>42,601</td>
</tr>
</tbody>
</table>
Year-over-Year Growth in Energy Efficiency

Figure 84.
Energy Efficiency Sector – Employment by Industry, 2017-2018

Construction: 484,482 (484,482) to 1,295,783 (+811,301)
Professional and Business: 321,582 (+6,004) to 1,295,783 (+20,809)
Manufacturing: 180,357 (+12,845) to 1,295,783 (+20,809)
Wholesale Trade: 42,682 (+2,001) to 1,295,783 (+20,809)
Other Services

Figure 85.
Energy Efficiency Sector – Employment by Detailed Technology, 2017-2018

ENERGY STAR Appliances, including High Efficiency HVAC: 595,331 (+22,116)
Traditional HVAC: 582,108 (+23,632)
Advanced and Recycled Building Materials
LED, CFL, and Other Efficient Lighting
Other: 207,780 (+1,184) to 128,996 (+4,817)
Renewable Heating and Cooling
Anticipated Employer Growth Has Been Challenged by Hiring Difficulty in Construction

Projected EE Construction Job Growth vs. Actual Growth

Hiring Difficulty in Construction

U.S. Unemployment Rate

Projected Growth

Actual Growth

Hiring Difficulty in Construction

U.S. Unemployment Rate

-20%
0%
20%
40%
60%
80%
100%
2016
2017
2018
2019
0%
12.00%
11%
11%
8.80%
-7.20%
1.60%
82%
83%
84%
83%
-20%
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The Energy Futures Initiative would like to thank the following organizations for sponsoring this report.

Southern California Gas Company  California Manufacturers & Technology Association
San Diego Gas & Electric  Air-Conditioning, Heating, & Refrigeration Institute
Utility Workers Union  California Restaurant Association
Gas Technology Institute  California Natural Gas Vehicle Coalition
Independent Energy Producers Association  Renewable Natural Gas Coalition
California Building Industry Association

www.energyfuturesinitiative.org
Energy Efficiency Provides the Largest Potential for GHG Reductions by 2030

Figure S-4

Identified Emissions Reduction Potential for Meeting the 2030 Targets by Cross-Cutting Technologies

Some decarbonization strategies are applicable to multiple sectors of the economy. Of these, energy efficiency/demand reduction is most significant, representing the largest emissions reduction potential and cutting across all five sectors. Source: EFI, 2019

<table>
<thead>
<tr>
<th>Description</th>
<th>U.S. Median BLS Hourly Earnings</th>
<th>U.S. Median EE Hourly Earnings</th>
<th>Wage Premium or Discount</th>
<th>Minnesota EE</th>
<th>MN Wage Premium or Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilermakers</td>
<td>$ 29.93</td>
<td>$ 30.83</td>
<td>$ 0.90</td>
<td>$ 48.64</td>
<td>$ 18.71</td>
</tr>
<tr>
<td>Brickmasons and Blockmasons</td>
<td>$ 23.93</td>
<td>$ 24.65</td>
<td>$ 0.72</td>
<td>$ 38.99</td>
<td>$ 14.96</td>
</tr>
<tr>
<td>Carpenters</td>
<td>$ 21.71</td>
<td>$ 22.36</td>
<td>$ 0.65</td>
<td>$ 35.28</td>
<td>$ 13.57</td>
</tr>
<tr>
<td>Construction Laborers</td>
<td>$ 16.60</td>
<td>$ 17.10</td>
<td>$ 0.50</td>
<td>$ 26.98</td>
<td>$ 10.38</td>
</tr>
<tr>
<td>Operating Engineers and Others</td>
<td>$ 22.61</td>
<td>$ 23.29</td>
<td>$ 0.68</td>
<td>$ 36.74</td>
<td>$ 14.13</td>
</tr>
<tr>
<td>Electricians</td>
<td>$ 26.01</td>
<td>$ 26.79</td>
<td>$ 0.78</td>
<td>$ 42.27</td>
<td>$ 16.26</td>
</tr>
<tr>
<td>Insulation Workers, Floor, Ceiling, and Wall</td>
<td>$ 17.81</td>
<td>$ 18.34</td>
<td>$ 0.53</td>
<td>$ 28.94</td>
<td>$ 11.13</td>
</tr>
<tr>
<td>Insulation Workers, Mechanical</td>
<td>$ 21.90</td>
<td>$ 22.56</td>
<td>$ 0.66</td>
<td>$ 35.59</td>
<td>$ 13.69</td>
</tr>
<tr>
<td>Plumbers and Pipefitters</td>
<td>$ 25.28</td>
<td>$ 26.04</td>
<td>$ 0.76</td>
<td>$ 41.08</td>
<td>$ 15.80</td>
</tr>
<tr>
<td>Roofers</td>
<td>$ 18.74</td>
<td>$ 19.30</td>
<td>$ 0.56</td>
<td>$ 30.46</td>
<td>$ 11.72</td>
</tr>
<tr>
<td>Sheet Metal Workers</td>
<td>$ 23.07</td>
<td>$ 23.76</td>
<td>$ 0.69</td>
<td>$ 37.49</td>
<td>$ 14.42</td>
</tr>
<tr>
<td>Structural Iron and Steel Workers</td>
<td>$ 25.30</td>
<td>$ 26.06</td>
<td>$ 0.76</td>
<td>$ 41.12</td>
<td>$ 15.82</td>
</tr>
</tbody>
</table>
Thank you!

Questions?

For more information, contact:
• David Foster at dafoster@energyfuturesinitiative.org

Download the 2019 USEER and State Fact Sheets at: www.usenergyjobs.org

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• Wisconsin Office of Energy Innovation
• Vermont Clean Energy Development Fund
• Advanced Energy Economy
• Clean Energy Trust
• Energy Foundation
• Energy Storage Association
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• Energy Futures Initiative
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