



# Energy Efficiency



## Energy Efficiency

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.<sup>81</sup>

### TRENDS

- 2018 Job Growth.** In 2018, the Energy Efficiency sector continued to produce the most new jobs of any energy sector—over 76,000—with 2,324,866 jobs in total. Demand growth for efficient technology and building upgrades has driven expansion across many traditional industries including construction trades (which added almost 21,000 jobs) and professional services (which added 35,000 employees).
- 2019 Expectations.** Energy Efficiency employers report a projected growth rate for employment in 2019 of almost 8 percent. Construction employers, in particular, report expected Energy Efficiency job growth of 8.8 percent by the end of 2019.
- Key Occupations:** The majority (nearly 56 percent) of Energy Efficiency employees worked at construction firms in 2018, installing or servicing Energy Efficiency goods or performing Energy Efficiency related services.<sup>82</sup> Approximately one in five workers in the Energy Efficiency sector worked in professional and business services.

# 3.4%

Energy Efficiency job growth in 2018.

# 7.8%

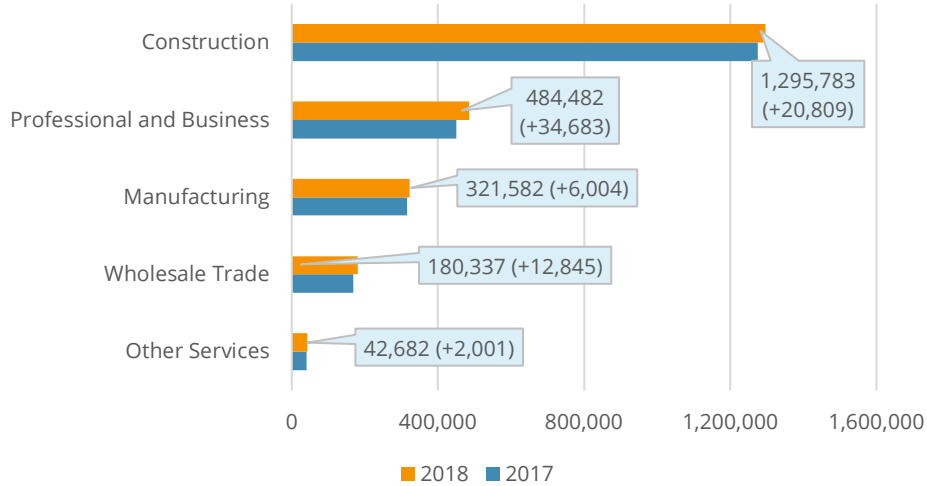
Employers predict 7.8% Energy Efficiency job growth in 2019.

<sup>81</sup> Estimates do not include retail employment. ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency.

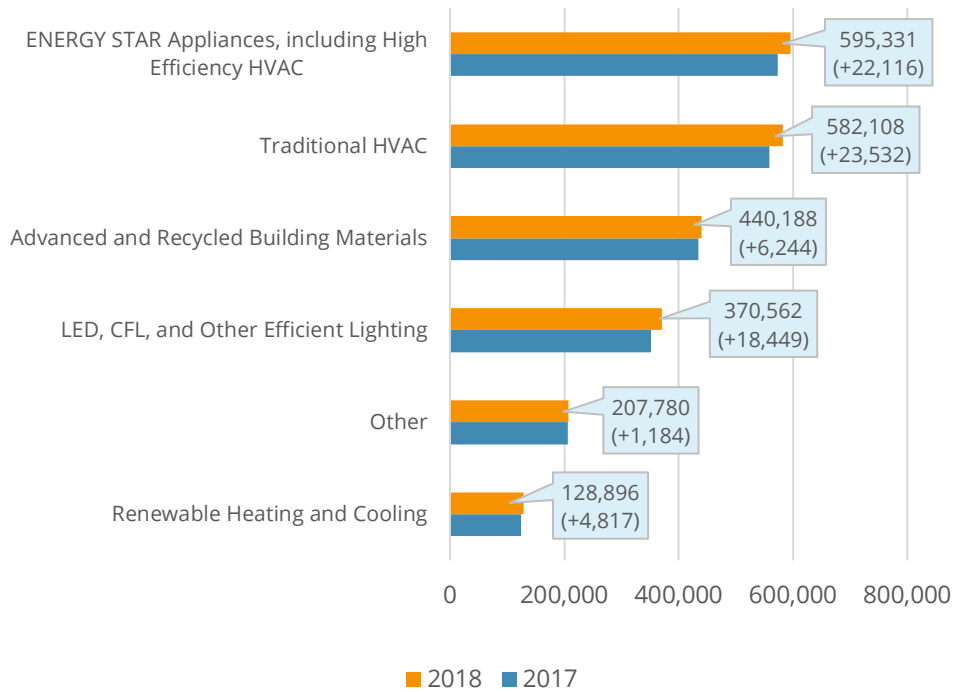
<sup>82</sup> Building control equipment includes electrical equipment to automate, manage, or otherwise control mechanical and electrical building components such as lighting, ventilation, and power systems equipment.

## SNAPSHOT OF EMPLOYMENT

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



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



## KEY TAKEAWAYS

- The manufacture of energy efficiency products, including those certified by ENERGY STAR, represented a sizeable portion of employment in 2018, with just under 14 percent of the total Energy Efficiency workforce. This represents an increase of 2 percent from 2017, or approximately 6,000 new jobs.
- Professional and business services added 34,700 new jobs. Construction added nearly 21,000 jobs in 2018. Construction firms working in the Energy Efficiency sector reported that 79 percent of their employees spend a majority of their time working with energy efficiency technologies, nearly even with the 80.3 percent reported in 2017.

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

	Total	Construction	Manu- facturing	Wholesale Trade	Professional Services	Other Services
<b>ENERGY STAR Appliances</b>	167,828	86,547	17,350	12,852	46,671	4,408
<b>LED, CFL and Other Efficient Lighting</b>	370,562	184,471	49,408	39,266	93,901	3,517
<b>Traditional HVAC goods, control systems, and services</b>	582,108	322,181	33,023	54,354	156,326	16,224
<b>ENERGY STAR/ High Efficiency heating and cooling equipment</b>	427,503	275,285	74,791	26,362	46,421	4,644
<b>Renewable Heating and Cooling (including Solar Thermal)</b>	128,896	82,513	7,823	7,865	29,909	785
<b>Advanced Building Materials/Insulation</b>	357,765	204,245	74,377	22,462	54,297	2,384
<b>Recycled building materials</b>	82,423	46,921	11,844	2,801	17,849	3,007
<b>Reduced water consumption products and appliances</b>	91,555	58,069	6,109	5,291	20,728	1,358
<b>Other</b>	116,225	35,550	46,856	9,086	18,379	6,354
<b>TOTAL</b>	<b>2,324,865</b>	<b>1,295,782</b>	<b>321,581</b>	<b>180,339</b>	<b>484,481</b>	<b>42,681</b>

## HIRING DIFFICULTY

- **84 percent of construction employers in energy efficiency** reported that it was somewhat difficult or very difficult to hire new employees in 2018 (with 52 percent reporting that it was very difficult, increasing from 47.3 percent in 2017).
- **82 percent of professional and business employers in energy efficiency** reported that it was either somewhat difficult or very difficult to hire new employees.
- **72 percent of energy efficiency manufacturing employers** reported that it was either somewhat or very difficult to hire new employees.

## HIGHEST-DEMAND OCCUPATIONS IN ENERGY EFFICIENCY

With significant growth in 2017 and predicted growth of 180,000 new jobs in 2019, energy efficiency employers have identified below the occupations that each industry sector is having the greatest difficulty in filling.

**Table 45.**  
**Energy Efficiency Sector – Reported Occupations with Hiring Difficulty by Industry, Q4 2018**

Construction	Manufacturing	Wholesale Trade, Distribution, and Transport	Professional and Business Services
Technician or mechanical support (42%)	Sales, marketing, or customer service representatives (24%)	Sales, marketing, or customer service representatives (67%)	Engineers/scientists (28%)
Electricians (41%)	Technician or mechanical support (21%)	Technician or mechanical support (25%)	Management (directors, supervisors, vice presidents) (21%)
Installation workers (27%)	Engineers/scientists (21%)	Management (directors, supervisors, vice presidents) (19%)	Designers or architects (18%)

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## Spotlight: “We don’t need to choose between good jobs and a clean environment. We can and will have both.”

**Leo Gerard**, International President, United Steelworkers

The United Steelworkers is North America’s largest manufacturing union, representing 1.2 million active and retired members in the U.S. and Canada.

Leo Gerard, International President, United Steelworkers observed, “The cheapest way to get carbon out of the atmosphere and create jobs is through energy efficiency. I’ve been saying this for a long time. If we retrofitted every public school in America, if we retrofitted every government building, and then if we started on all our commercial buildings, we’d create millions of construction jobs.



“And when we start retrofitting our buildings, we create demand for the steel, the aluminum and the cement that puts our Steelworkers back to work. We have hundreds of thousands of miles of old transmission and distribution pipes that are leaking methane and others that are leaking clean water and wasting the energy that operates our filtration plants.

“All these investments will pay for themselves, clean up the environment and create jobs. I’ve said it for a long time and I’ll say it again. We don’t need to choose between good jobs and a clean environment. We can and will have both.”

## INTRODUCTION

There are no individual NAICS codes that can be entirely allocated to Energy Efficiency employment. Thus, BLS has no specific data sets that exclusively count jobs in this sector. A key component of the USEER employer survey is the ENERGY STAR program, which was founded twenty-five years ago.

The ENERGY STAR program is recognized by over 90 percent of American households, while 40 percent of Fortune 500 companies rely on ENERGY STAR to deliver energy-saving solutions.

ENERGY STAR sets definitions of efficiency leadership for 75 different residential and commercial products that in turn cover over 60,000 individual product models. Identifying the jobs that produce and install these products is one of the key tasks of the USEER survey. However, ENERGY STAR also administers three additional programs for commercial buildings, industrial plants, and new and existing homes. While the USEER survey counts these jobs in its interviews with construction and maintenance firms, the jobs are not necessarily identified with ENERGY STAR. Future additions of the USEER will specifically seek to address this gap.

In addition to identifying jobs that manufacture ENERGY STAR labeled products, the USEER identifies employment in building design and contracting services that provide insulation, improve natural lighting, and reduce overall energy consumption across homes and businesses.<sup>83</sup> The USEER Energy Efficiency employment figures include only work with these efficient technologies or building design and retrofits. The report does not capture employment related to energy-efficient manufacturing processes. It does capture employment associated with CHP and waste-heat to power (WHP), though these technologies are included in the Electric Power Generation chapter. In the meantime, please see the recently released Energy Productivity and Economic Prosperity Index for more information on manufacturing process efficiency.<sup>84</sup>

Demand growth for efficient technology and building upgrades has driven expansion across many traditional industries, including construction trades, appliance manufacturing, building materials, lighting, and other energy-saving goods and services. As such, Energy Efficiency workers are found across many subsets of traditional industries.

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<sup>83</sup> Estimates do not include retail employment.

<sup>84</sup> Kornelis Blok, Paul Hofheinz, and John Kerkoven, *The 2015 Energy Productivity and Economic Prosperity Index* (Brussels: Lisbon Council for Economic Competitiveness and Social Renewal, 2015), <https://lisboncouncil.net/publication/publication/121.html>.

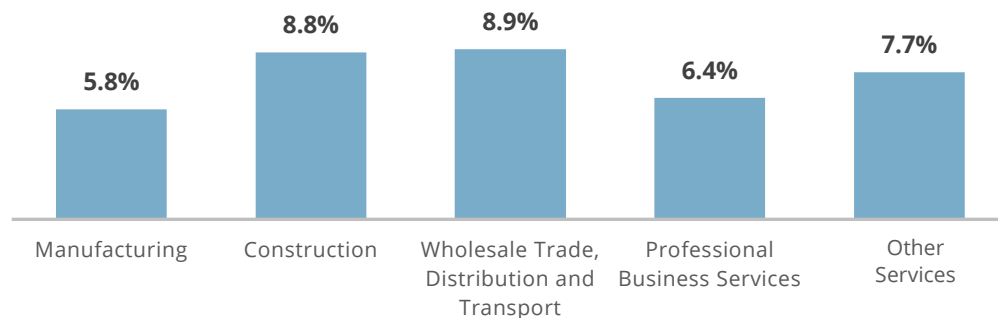
## SUMMARY

Energy Efficiency employment grew in 2018 by just over 3 percent from 2017. The 2018 USEER has identified approximately 2.32 million workers across the construction, manufacturing, wholesale trade, professional and business services, and other services industries that spent some or all of their time working with energy-efficient technologies and services in 2018, as defined earlier in this report. At least 595,000 of these employees were directly involved in producing or installing ENERGY STAR certified appliances; ENERGY STAR certified heating and cooling equipment; or similarly highly efficient heating, ventilation, and air-conditioning (HVAC) equipment. Future editions of the USEER will identify additional ENERGY STAR jobs related to the program's commercial building, industrial, and new and existing home programs.

Energy Efficiency employers report a projected growth rate for employment in 2019 of nearly 8 percent. Construction employers, in particular, report expected Energy Efficiency job growth of 8.8 percent by the end of 2019.

**Figure 86.**

### Energy Efficiency Sector - Expected Employment Growth by Major Industry (Q4 2018 - Q4 2019)



The majority, nearly 56 percent, of Energy Efficiency employees worked for firms in the construction sector in 2018, installing or servicing Energy Efficiency goods or performing Energy Efficiency related services.<sup>85</sup> Approximately one in five workers in the Energy Efficiency sector worked in professional and business services. The manufacture of ENERGY STAR certified products represented a sizable portion of employment in 2017, with just under 14 percent of the total Energy Efficiency workforce. This represents an increase of 2 percent from 2017.

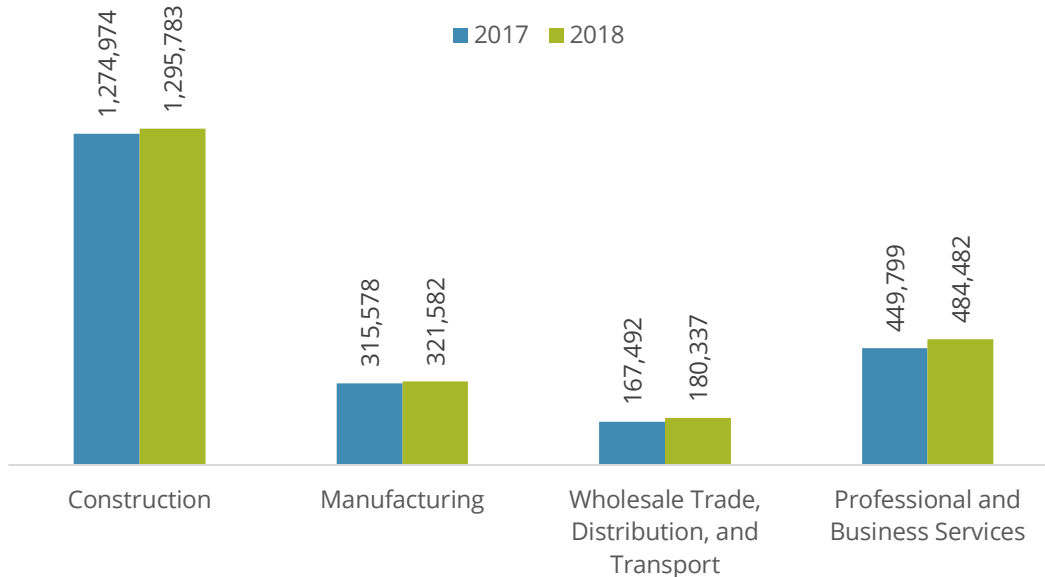
<sup>85</sup> Building control equipment includes electrical equipment to automate, manage, or otherwise control mechanical and electrical building components such as lighting, ventilation, and power systems equipment.



The 2019 USEER does not cover retail trade, but BLS data finds that retail trade industries that sell and distribute ENERGY STAR appliances and building materials (as well as non-qualifying appliances and building materials) employ approximately 4.7 million Americans across several different sectors.<sup>86</sup>

The market penetration—and resulting manufacture and sales—of certified ENERGY STAR products continues to increase.<sup>87</sup> The penetration and revenues from ENERGY STAR products varies significantly. For example, in 2017, only 3 percent of ceiling fans with lights, 21 percent of computer workstations, 38 percent to 40 percent of clothes dryers, and 18 percent to 59 percent of commercial cooking equipment meet ENERGY STAR guidelines. However, between 44 percent and 46 percent of refrigerators (commercial and residential, respectively), and 70 percent of LED bulbs, 88 percent of dehumidifiers, 90 percent of notebook computers, and 99 percent of multifunction printers are certified ENERGY STAR products.<sup>88</sup> A table of products tracked by the EPA is available in Appendix C.

**Figure 87.**  
**Energy Efficiency Sector – Employment by Major Industry Sectors, Q2 2018**



<sup>86</sup> These industries include Household Appliance Stores (443141), Electronics Stores (443142), Building Material and Supplies Dealers (4441), Department Stores (452210), and Warehouse Clubs and Supercenters (452311). These are retail establishments that are not defined by their sale of ENERGY STAR appliances or EE products. Some are defined by their sale of appliances in general (i.e., those under NAICS 4431) but even these are not the sole retailers of EE products – they could be general retailers as well such as big box stores that sell wide varieties of items.

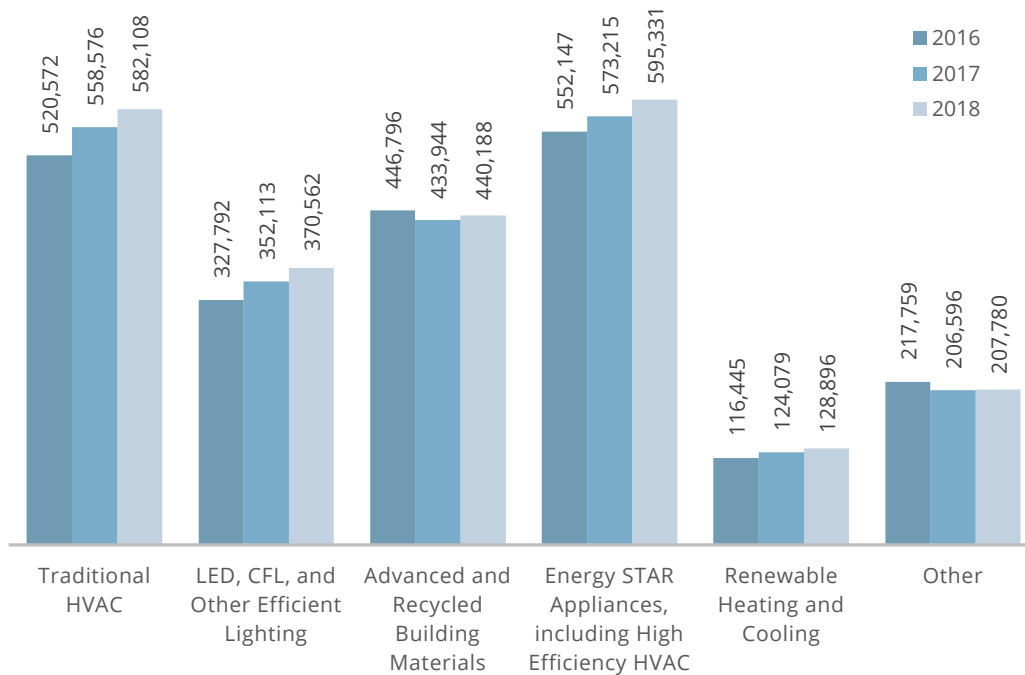
<sup>87</sup> This trend can be generally seen by comparing recent annual editions of the *ENERGY STAR Unit Shipment and Market Penetration Report*, available at [https://www.energystar.gov/index.cfm?c=partners.unit\\_shipment\\_data\\_archives](https://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives). When an ENERGY STAR specification for a particular product type is strengthened, there is sometimes a decrease in the market penetration of the products meeting that higher specification in the following year.

<sup>88</sup> EPA, *ENERGY STAR Unit Shipment and Market Penetration Report: Calendar Year 2017 Summary* (Washington, D.C., 2018), [https://www.energystar.gov/ia/partners/downloads/unit\\_shipment\\_data/2017/2017%20Unit%20Shipment%20Data%20Summary%20Report.pdf?8fd5-1967](https://www.energystar.gov/ia/partners/downloads/unit_shipment_data/2017/2017%20Unit%20Shipment%20Data%20Summary%20Report.pdf?8fd5-1967).

## ENERGY EFFICIENCY EMPLOYMENT BY DETAILED TECHNOLOGY APPLICATION

As depicted in Figure 88, ENERGY STAR appliances, including high efficiency heating and cooling equipment, was the largest category of employment in the Energy Efficiency sector, employing just over a quarter of the Energy Efficiency workforce in 2018. The second largest category of employment was the traditional HVAC industry, with just under a quarter of the sector’s employment in 2018. These employees spent a majority of their time working with traditional HVAC goods and services, but a portion of their time was also dedicated to energy-efficient technologies. This is an important distinction, particularly with installers, because the majority of these employees would also have specific training in high-efficiency HVAC systems.<sup>89</sup> The third largest category of employment was advanced building materials, followed by energy efficient lighting. The Other category in Figure 88 includes reduced water consumption products and appliances.

**Figure 88.**  
**Energy Efficiency Sector – Employment by Detailed Technology Application (Q2 2016 - Q2 2018)**



<sup>89</sup> Unlike the installation and repair of ENERGY STAR appliances, such as dishwashers, refrigerators, or other energy-efficient products, high-efficiency HVAC systems often have very specific certifications or training requirements in order to properly install and maintain the equipment. Manufacturers often require such certifications for warranty purposes, and EPA has a specific credentialing program for ENERGY STAR heating and cooling (see: [http://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_hvac\\_contractors\\_become](http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_hvac_contractors_become)).

Construction firms working in the Energy Efficiency sector reported that 79 percent of their workers spend at least 50 percent of their time on energy efficiency-related work. This was down slightly from 80.3 percent in 2017 after two years of very rapid growth in 2016 and 2017.

Construction workers across the Energy Efficiency sector are primarily engaged in both traditional HVAC and high efficiency heating and cooling equipment; together, these two technology applications accounted for 46 percent of construction-related work in the Energy Efficiency sector in 2018. Advanced and recycled building materials and insulation technologies also supported a significant amount of construction employment—over 251,100 jobs. The manufacturing industry is heavily concentrated in high efficiency heating and cooling equipment as well as advanced and recycled building materials and insulation—approximately 157,400 manufacturing employees or half of efficiency-related manufacturing work in 2018. About three in ten workers in the wholesale trade industry and nearly a third in professional and business services were mostly working with traditional HVAC goods.

**Table 46.**  
**Energy Efficiency Sector – Employment by Detailed Technology**  
**Application and Industry, Q2 2018**

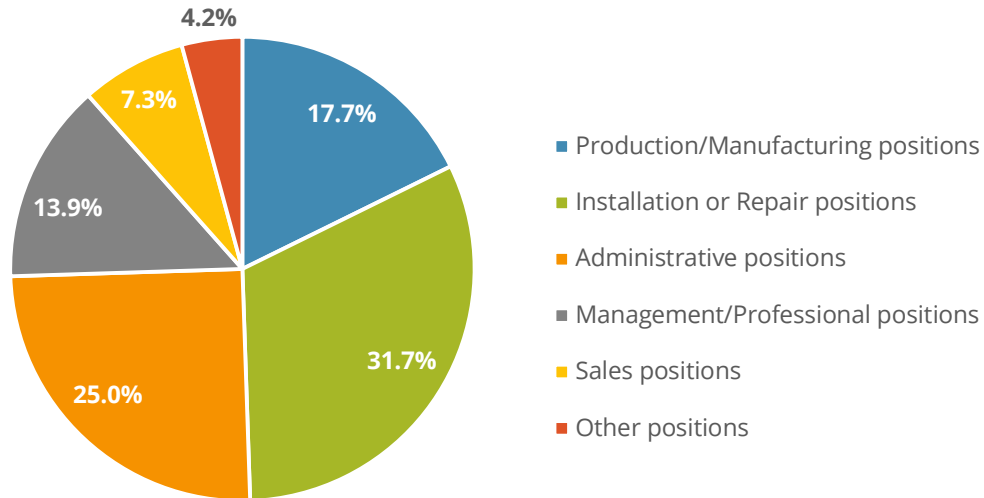
	Total	Construction	Manufacturing	Wholesale Trade	Professional Services	Other
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<b>TOTAL</b>	<b>2,324,865</b>	<b>1,295,782</b>	<b>321,581</b>	<b>180,339</b>	<b>484,481</b>	<b>42,681</b>

## ENERGY EFFICIENCY – WORKFORCE CHARACTERISTICS

Nearly 32 percent of all workers in Energy Efficiency were employed in installation or repair positions in 2018, followed by administrative positions (25 percent).

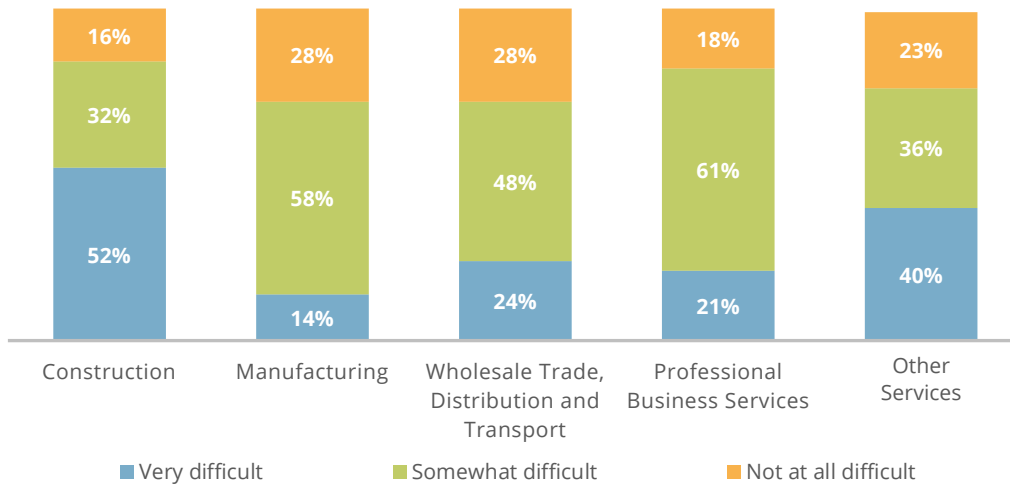
**Figure 89.**

### Energy Efficiency Sector – Occupational Distribution, Q4 2018

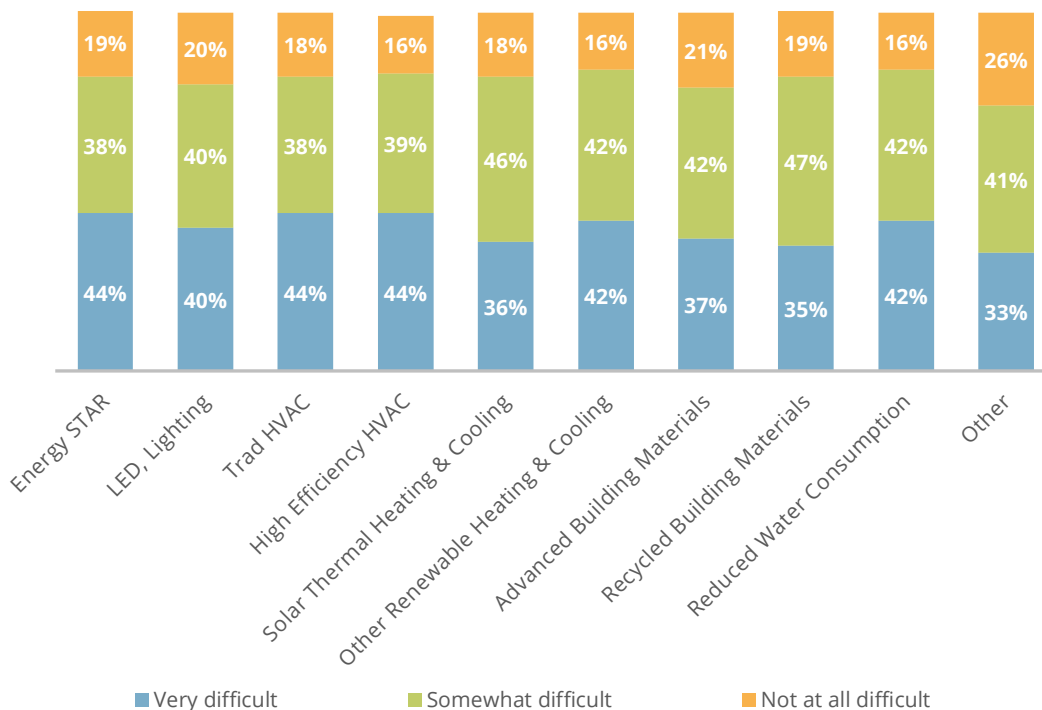


In the Energy Efficiency sector, 84 percent of employers in construction and 82 percent of professional and business services reported some difficulty finding qualified job applicants. Seventy percent or more of Energy Efficiency employers in all industries reported at least some difficulty in hiring. Energy Efficiency construction, the largest single segment of the traditional and energy efficiency sectors with over 1.2 million employees, also reported the single highest degree of difficulty in hiring new employees.

**Figure 90.**  
**Energy Efficiency Sector – Hiring Difficulty by Industry, Q4 2018**



**Figure 91.**  
**Energy Efficiency Sector – Hiring Difficulty by Technology, Q4 2018**



Employers in Energy Efficiency with hiring difficulty indicated that lack of experience, training, or technical skills were the reason for the largest share of difficulty finding qualified applicants.

**Table 47.**  
**Energy Efficiency Sector – Reasons for Hiring Difficulty by Industry, Q4 2018**

Construction	Manufacturing	Wholesale Trade, Distribution, and Transport	Professional and Business Services
Lack of experience, training, or technical skills (48%)	Lack of experience, training, or technical skills (55%)	Lack of experience, training, or technical skills (49%)	Lack of experience, training, or technical skills (40%)
Competition/ small applicant pool (24%)	Insufficient non-technical skills (39%)	Insufficient non-technical skills (27%)	Competition/ small applicant pool (22%)
Insufficient non-technical skills (24%)	Difficulty finding industry-specific knowledge, skills, and interest (18%)	Competition/ small applicant pool (19%)	Insufficient qualifications, certifications, education (19%)

The following table lists the occupations by industry that Energy Efficiency employers mentioned were the most difficult to fill in 2018.

**Table 48.**  
**Energy Efficiency – Reported Occupations with Hiring Difficulty by Industry, Q4 2018**

Construction	Manufacturing	Wholesale Trade, Distribution, and Transport	Professional and Business Services
Technician or mechanical support (42%)	Sales, marketing, or customer service representatives (24%)	Sales, marketing, or customer service representatives (67%)	Engineers/ scientists (28%)
Electricians (41%)	Technician or mechanical support (21%)	Technician or mechanical support (25%)	Management (directors, supervisors, vice presidents) (21%)
Installation workers (27%)	Engineers/scientists (21%)	Management (directors, supervisors, vice presidents) (19%)	Designers or architects (18%)

Less than a quarter of employees in 2018 were reported to be women (24 percent – half the proportion when compared to national workforce averages), and there were fewer Black or African American workers and slightly fewer Hispanic or Latino and Asian workers compared to the national workforce average. However, overall racial diversity in the energy efficiency workforce was equivalent to the national workforce. Unionization rates in the Energy Efficiency sector in 2018 were equivalent to the national average at 11 percent.

**Table 49.**  
**Energy Efficiency Sector – Demographics, Q4 2018**

Demographic	Employees	Percent of Sector	National Workforce Averages
<b>Male</b>	1,767,865	76%	53%
<b>Female</b>	557,000	24%	47%
<b>Hispanic or Latino</b>	365,427	16%	17%
<b>Not Hispanic or Latino</b>	1,959,438	84%	83%
<b>American Indian or Alaska Native</b>	32,553	1%	1%
<b>Asian</b>	120,540	5%	6%
<b>Black or African American</b>	175,914	8%	12%
<b>Native Hawaiian or other Pacific Islander</b>	26,716	1%	>1%
<b>White</b>	1,811,682	78%	78%
<b>Two or more races</b>	157,460	7%	2%
<b>Veterans</b>	235,384	10%	6%
<b>55 and over</b>	327,072	14%	23%
<b>Union</b>	251,785	11%	11%