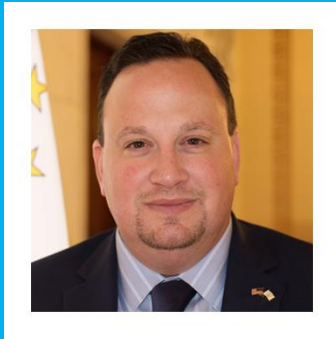


**2020**  
Rhode Island  
Clean Energy  
Industry Report





**NICHOLAS UCCI**



**STEFAN PRYOR**

The Rhode Island Office of Energy Resources (OER) and the Executive Office of Commerce are pleased to present the 2020 Rhode Island Clean Energy Jobs Report. Today, we count more than 16,000 jobs in Rhode Island’s clean energy economy, a 74 percent increase since 2014, when we began tracking this figure. There is sustained growth in the clean energy job market and this year, workers are spending a greater percentage of their time on clean energy tasks. The clean energy economy in Rhode Island is strong and there are more jobs on the way.

The Clean Energy Jobs report is a valuable tool for government policy makers because it helps identify where growth is occurring and what barriers may impede this growth. It also provides information on what skills training is needed in order to build a pipeline of talent, what sectors have gaps in workforce development opportunities, and how to more effectively match qualified workers with employers.

Rhode Island continues to accelerate its adoption of clean energy resources. In March 2017, Governor Gina M. Raimondo announced a strategic goal to increase the state's clean energy portfolio ten-fold by the end of 2020 – achieving a total of 1,000 MW of clean energy projects. As of publishing, the state now counts 920 MW of renewables. With the addition of the 400 MW Revolution Wind offshore wind project, approximately 85 percent of Rhode Island's current clean energy portfolio is comprised of in-state renewables or projects scheduled for adjacent federal waters. This past January, the Governor has challenged Rhode Island to be even bolder by meeting 100 percent of its electricity deliveries with renewables by 2030 – a nation-leading pace.

Additionally, Rhode Island continues to be ranked among the top three states in the U.S. for energy efficiency programs and innovation. Energy efficiency represents the least-cost means of reducing energy consumption and costs for local consumers, while shrinking carbon footprints and spurring economic opportunity. In fact, the state’s 2018 programs produced total system benefits of \$483 million and directly or indirectly engaged more than 1,100 firms.

As the state looks ahead, continued policy support for least-cost procurement initiatives and renewable growth will be vital to sustain and further expand Rhode Island’s burgeoning clean energy industry. Preparing Ocean State workers to support that work will also be critical. Programs such as Real Jobs Rhode Island, led by the Rhode Island Department of Labor and Training, has provided essential job training opportunities for the solar industry as well as educational programming for middle and high school students who are planning to enter the growing offshore wind market. In the most recent round of funding, DLT announced the Fostering Fuel Talent partnership. This program will provide workforce training opportunities to the delivered fuel sector to retrain workers in energy efficiency and renewable heating and cooling careers.

We are thankful to Governor Gina Raimondo, the General Assembly, and the Department of Labor and Training for helping to make Rhode Island a leader in clean energy and continuing to foster growth across this sector of our local economy.

Sincerely,

Nicholas Ucci  
Energy Commissioner  
Rhode Island Office of Energy Resource

Stefan Pryor  
Rhode Island Secretary of Commerce



# Acknowledgments

This Clean Energy Industry Report is the sixth iteration in a series of reports conducted and written by BW Research Partnership, Inc. under commission by the Rhode Island Office of Energy Resources and the Renewable Energy Fund at Commerce RI. Thank you to the stakeholders who responded to the survey which resulted in the data summarized in this report.

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# Executive Summary

As detailed in this 2020 Rhode Island Clean Energy Industry Report, the state's clean energy sector employed 16,348 workers as of the fourth quarter of 2019; this represents a remarkable 77.3 percent increase in jobs since 2014. During this period, clean energy businesses created 7,130 new jobs. The energy efficiency sector accounted for 66 percent of the new jobs created since 2014. Moreover, the number of full-time equivalent (FTE) clean energy workers grew by 101.8 percent since 2014, as the intensity and concentration of clean energy activity increases in the state.

In 2019, the solar industry rebounded, both nationally and within the state, following a three-year nationwide employment decline. Solar jobs in Rhode Island grew by 2.8 percent over the previous 12 months, adding 38 jobs back to the workforce. Across the US, solar jobs grew by 3.2 percent over the same time. The state also saw modest growth in the wind energy sector over those 12 months but is expected to see further growth over 2020 and beyond with the development of new, scalable offshore wind resources soon underway.

The core of clean energy activity in Rhode Island rests in installation, maintenance, and repair. This sector almost doubled in size since 2014, adding 4,415 new jobs to the clean energy labor force. Much of the growth in installation and maintenance is likely attributable to increasing renewable energy intensities and growth in installed solar capacity. Renewable energy workers spending 100 percent of their time on clean energy work increased by 20 points since 2014 while statewide solar capacity rose from under 10 MW in 2014 to more than 60 MW in 2018. The state's research, engineering, and professional service support for clean energy activity was also a significant source of employment. These companies accounted for 20 percent of clean energy work, or about 3,200 jobs.

The 2020 report also finds that clean energy occupations are a source of sustainable-wage employment for Rhode Island residents, and especially for high unemployment communities. Entry-level clean energy jobs across installation, sales, and manufacturing all provide a premium compared to corresponding statewide medians. An entry-level clean energy sales representative makes \$27.03 in Rhode Island—51 percent higher than the overall median wage for sales representatives across the state. Similarly, an entry-level clean energy HVAC worker makes 57 percent more than the average HVAC installer.

For entry-level workers—young adults and those with lower educational attainment—clean energy vocational trades present potential job opportunities. Across all technology sectors, about 20 to 25 percent of new hires in the past year have required no more than vocational or technical postsecondary training.

It is important to note that this report was commissioned before the global Coronavirus (COVID-19) pandemic, which has significantly altered labor market and employment realities. The 2020 Rhode Island Clean Energy Industry Report is based on data collected in the last quarter of 2019, before the advent of COVID-19. As a result, the employment figures included throughout this report serve as a pre-crisis baseline of clean energy industry

employment. While the full extent of the economic impact of the pandemic are yet unknown, BW Research estimates that Rhode Island has already lost 3,811 clean energy jobs as of April 2020—a 23.3 percent decline—due to the COVID-19 economic fallout. Further analysis related to the COVID-19 pandemic’s economic impacts can be found at <http://bwresearch.com/covid19>.

However, despite the COVID-19 pandemic, clean energy remains an important component of the state’s economy, and the continued acceleration of clean energy deployment is expected to have a profound impact on future employment growth in Rhode Island in the coming years following the COVID-19 recovery. Several initiatives, such as the development of Rhode Island’s offshore wind industry, expansion of brownfield and carport solar PV projects, as well as new heat pump incentives are expected to boost job growth in Rhode Island while more significant initiatives—such as Governor Raimondo’s call to meet 100 percent of electricity demand with renewables—are implemented. In order to meet these goals and ensure continued job growth for Rhode Island workers, it is increasingly important to remain committed to policy support that fosters a stable business environment for clean energy firms.<sup>1</sup>

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<sup>1</sup> <https://www.ri.gov/press/view/37527>

# Introduction



Rhode Island is a national clean energy leader. The state’s long-term commitments to reduce greenhouse gas emissions and mitigate the impacts of climate change have provided tangible environmental and economic benefits. Rhode Island has made significant progress towards a low-carbon future, including passing the Resilient Rhode Island Act—which establishes targets for the state to reduce its emissions to 80 percent below 1990 levels by 2050—and joining the U.S. Climate Alliance, a bi-partisan coalition of governors committed to reducing greenhouse gas emissions in line with the Paris Climate Agreement.

Rhode Island has demonstrated its commitment to clean energy industry growth by supporting innovative policies, programs, and other investments that have helped nurture a burgeoning new economic sector. The state is home to North America’s first operational offshore wind farm off the coast of Block Island and recently selected a much larger project—the 400 MW Revolution Wind project—to further industry expansion. Rhode Island remains a nationally-recognized energy efficiency leader consistently ranked among the top states for energy efficiency programs, policies, and innovation. The Governor and General Assembly have also continued to support key renewable energy programs that support local clean energy project development and industry growth, including the Renewable Energy Growth Program, the Renewable Energy Fund, the Efficient Building Fund, and a Commercial PACE program.

In January 2020, Governor Gina Raimondo signed Executive Order 20-01, establishing the most progressive clean energy mandate of any state; the order calls for 100 percent of statewide electricity deliveries to be met by renewables by 2030.<sup>2</sup> This mandate sends a strong signal to the marketplace— employers and investors—that Rhode Island is committed to its clean energy economy and workforce. Furthermore, in July 2019, the Governor launched a statewide Heating Sector Transformation (HST) initiative which will advance the state’s development of clean, affordable, and reliable heating technologies.<sup>3</sup> Decarbonizing the state’s heating sector, such as through the installation of high-efficiency electric heat pumps, will create significant new job opportunities for installers and other clean energy workers.

Rhode Island’s nation-leading policy efforts have contributed to the state’s sustained job growth. Targets and incentives provide the predictability and demand boost necessary for businesses to hire new employees, while investments into innovative technologies encourage even more businesses to enter the industry.

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<sup>2</sup> <http://www.energy.ri.gov/100percent/>

<sup>3</sup> <http://www.energy.ri.gov/HST/>

## Offshore Wind

Several recent offshore wind projects approved by Rhode Island, Massachusetts, and Connecticut are expected to have significant employment impacts across the state. Revolution Wind, a 704-megawatt wind farm located at least 15 miles off the coast of Rhode Island, is a joint project between Ørsted Wind and Eversource. The project includes 400 MW of renewable electricity for the Rhode Island grid and over 300 MW for Connecticut. The combined project is expected to create more than 1,100 construction jobs and will include \$40 million in port infrastructure improvements in Rhode Island.

Initial job impacts of the project can already be identified, as companies such as Boston Wind, Ørsted, and GEV Wind have located U.S. Headquarters in the state. In March of 2020, Ørsted announced the opening of a new innovation hub in Providence. The hub will identify, foster, and finance enterprises related to offshore wind, with a focus on next generation technology and related innovation in the offshore wind energy field. Over the coming year, the industry will add jobs in port infrastructure development, scientific and technical services, financing, and legal, accounting, and other support services. As construction commences, a large number of supply chain jobs from manufacturing to shipping and boatbuilding will be created.

## Renewable Electricity Goals

The January 2020 signing of Executive Order 20-01 set a goal for 100 percent of statewide electricity deliveries to be met by renewables by 2030; this mandate followed a March 2017 goal of installing 1,000 megawatts (MW) of clean energy generation capacity by 2020. Since 2016, Rhode Island has increased clean energy generation from 100 MW to 920 MW (as of 1Q 2020).<sup>4</sup> Renewable energy generation employment jumped significantly in 2016 and has sustained itself since, with 2020 employment (2,066 jobs) nearly double that of 2015 (1,079 jobs). The latest goal of 100 percent renewable electricity by 2030 will require further increases in renewable generation capacity as well as energy efficiency improvements, the latter of which has even larger job creation potential. Most importantly, the goal-setting efforts signal to investors that Rhode Island will continue to provide the policy landscape necessary to support long-term clean energy growth.

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<sup>4</sup> <http://www.energy.ri.gov/renewable-energy/governor-clean-energy-goal.php>

## Brownfields Solar PV Program

Commerce Rhode Island's Brownfields Solar PV Program provides \$1 million in grant funding to incentivize development of solar photovoltaic projects across the state's brownfields; these areas are often ideal locations for renewable energy projects, as they are barred from regular use due to previous industrial or commercial contamination. The program began in March 2019 and solar PV projects that are sited on brownfields are eligible to receive financial incentives from the Renewable Energy Fund. The program received additional funding to continue into 2020 and will reopen in late spring. The state earmarked another \$1 million<sup>5</sup> in funding for solar carports to further maximize the use of available space for solar PV siting; applications for this program were accepted starting June 2019.<sup>6</sup> These additional financial incentives will increase siting and development of large-scale solar PV projects, which is in turn expected to boost solar employment growth in the coming years.

## Heat Pumps

Rhode Island is seeking new ways to reduce emissions from heating, which contribute to 30 percent of the state's carbon emissions, by transitioning from oil and gas-powered furnaces to heat pumps. Currently, National Grid offers rebates of \$1,000 per ton for Rhode Island customers, and there are some manufacturer rebates as well.<sup>7</sup> In July 2019, Governor Raimondo signed an Executive Order launching a Heating Sector Transformation Initiative in Rhode Island. Led by the Office of Energy Resources (OER) and the Division of Public Utilities and Carriers (DPUC), this effort is intended to advance Rhode Island's development of a cleaner, more affordable and reliable heating future, and engage public and private sector partners in the identification of economic, energy, and environmental opportunities and challenges posed by our state's heating sector.<sup>8</sup> These agencies issued a comprehensive report on heating sector decarbonization in December 2019, with strategies to foster a no-to-low carbon heating future. Moreover, the Office of Energy Resources earmarked Regional Greenhouse Gas Initiative Funds (RGGI) to support heat pump rebates for oil and propane fuel customers as well. Increased heat pump installations, an intended result of these incentives, is expected to increase HVAC employment in 2020.

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<sup>5</sup> <https://www.ri.gov/press/view/38233>

<sup>6</sup> Rhode Island Office of Energy Resources, Press Release. State Announce Initiatives to Expand Solar Energy on Brownfields and Carports. 28 March 2019.

<sup>7</sup> [https://www.nationalgridus.com/media/pdfs/resi-ways-to-save/ee7342-ri-hvac-rebate-\(4\).pdf](https://www.nationalgridus.com/media/pdfs/resi-ways-to-save/ee7342-ri-hvac-rebate-(4).pdf)

<sup>8</sup> Faulker, Tim. Heat Pumps and New Fuels May Help Decarbonize RI Heating. EcoRI News. 8 January 2020.



## About this Report

The 2020 Rhode Island Clean Energy Industry Report is the sixth annual report on clean energy employment in the state. The findings in this report are drawn from a comprehensive dataset developed by BW Research Partnership for the 2020 U.S. Energy and Employment Report (USEER).<sup>9</sup> The USEER was initially developed for the U.S. Department of Energy in 2015 and is now administered by the National Association of State Energy Officials (NASEO) and the Energy Futures Initiative (EFI).

The Rhode Island Clean Energy Industry Report provides valuable, longitudinal data on past, current, and projected employment, segmented by technology and value-chain. Analysis of barriers and opportunities, hiring difficulty, and work intensity provide important insights into the needs of the sector. This report also includes wage and wage premium data for a select set of clean energy occupations.

The Clean Energy Industry Report is a valuable tool for government policy makers because it identifies growth opportunities and barriers. It also provides information on what skills training is needed in order to build a pipeline of talent, what sectors have gaps in workforce development opportunities, and how to more effectively match qualified workers with employers.

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<sup>9</sup> National Association of State Energy Official (NASEO). Energy Futures Initiative (EFI). United States Energy and Employment Report (USEER), 2020. [www.usenergyjobs.org](http://www.usenergyjobs.org).

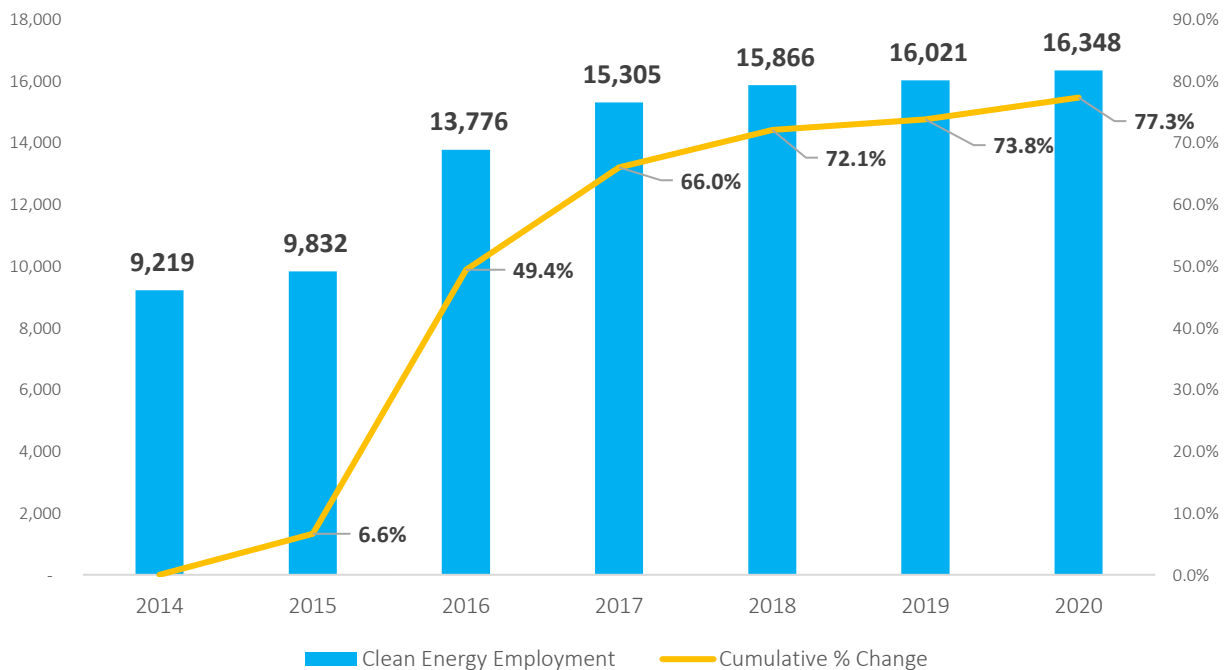
# Industry Overview



Clean energy employment in Rhode Island continues to grow each year. The industry employed a total of 16,348 workers at the end of 2019. Since 2014, the clean energy labor force grew by 77.3 percent, or an additional 7,130 new jobs. Between the last quarter of 2018 through the last quarter of 2019, the sector grew by two percent, adding 327 new jobs to the clean energy workforce in 12 months.

Clean energy jobs were growing faster than the overall statewide labor market, as total job growth in Rhode Island was only 0.6 percent over the same time. As of the last quarter of 2019, clean energy workers comprised 3.3 percent of Rhode Island's total labor force.<sup>10</sup>

**Figure 1. Clean Energy Employment, 2014-2020**

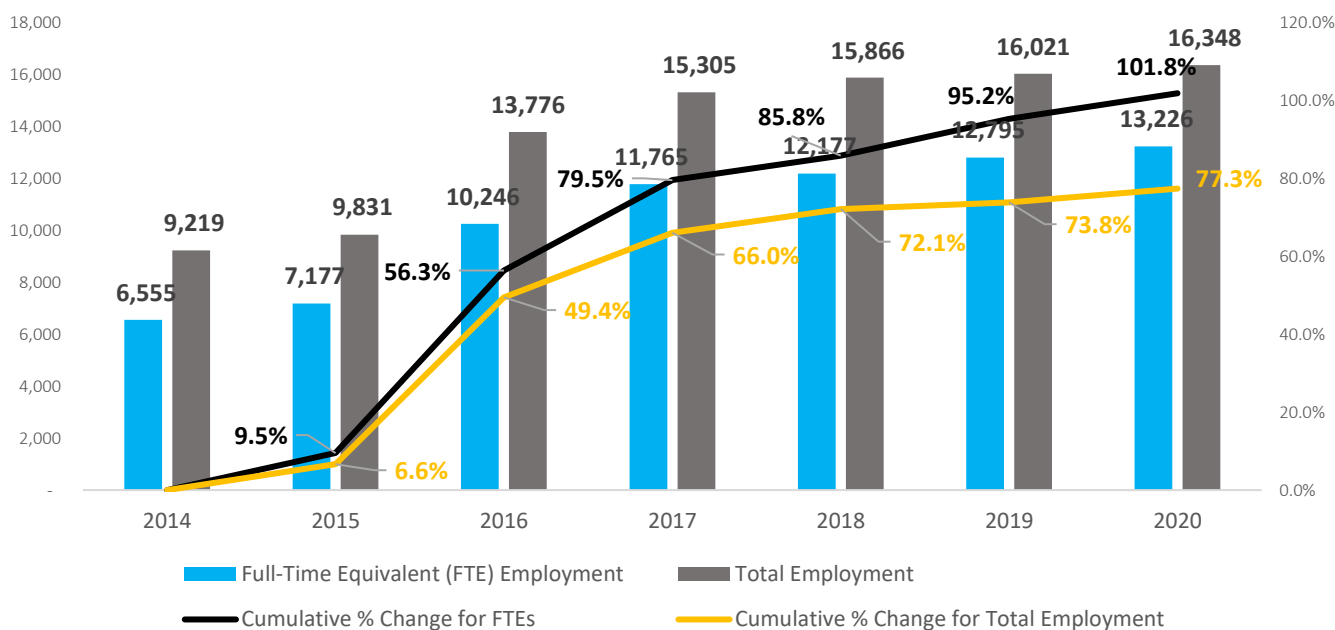


<sup>10</sup> Bureau of Labor Statistics, Quarterly Census of Employment and Wages. Data accessed on 5 March 2020.

While total clean energy jobs have been on the rise in Rhode Island, the number of full-time equivalent workers (FTEs) have been growing at an even faster rate.<sup>11</sup> FTE clean energy jobs weight workers based on the proportion of labors hours spent on clean energy activities; FTEs indicate the intensity or concentration of clean energy activity in a regional economy. As the number of FTE clean energy workers rises, this indicates that these jobs are increasingly able to spend more labor hours on clean energy-specific activities.<sup>12</sup>

The black line in Figure 2 highlights intensity-adjusted employment growth compared to total clean energy job growth (the orange line) between 2014 and 2020. For the first two years, FTE workers were growing only slightly faster—roughly two to six percentage points more—than the overall clean energy labor market. However, in 2016, FTE clean energy jobs began to grow at a much quicker pace, about 11 to 24 points more than the overall clean energy economy. Since 2014, FTE clean energy jobs grew more than 100 percent, essentially doubling in size in seven years. This resulted in 13,226 FTE clean energy workers as of the fourth quarter of 2019.

**Figure 2. Full-Time Equivalent (FTE) Clean Energy Employment, 2014-2020**



<sup>11</sup> Full-time equivalent (FTE) clean energy jobs are extrapolated by weighting each clean energy worker based on what proportion of their labor hours are spent on clean energy-related activities (0-49 percent, 50-99 percent, or 100 percent). Intensity-adjusted job figures for both 2014 and 2015 were retroactively extrapolated for this year’s report. Please note that the retroactive extrapolation of 2014 and 2015 FTE workers resulted in an update to the 2016 figures as a result of outlier analysis and methodological revisions.

<sup>12</sup> Much of this increase in clean energy intensity has come from the renewable energy sector. Renewable energy workers who spend 100 percent of their time working on clean energy activities has increased steadily from 68 percent in 2014 to 88 percent in 2020. In comparison, the energy efficiency sector has remained largely unchanged over the same time.

# Clean Energy Technology Analysis



Energy efficiency remained the largest sector in Rhode Island’s clean energy economy. Energy efficiency jobs in Rhode Island comprised one percent of total energy efficiency employment in the United States at the end of 2019.<sup>13</sup> Energy efficiency employers accounted for 9,566 jobs, a growth of two percent, or 187 jobs, over the previous 12 months. Overall, the energy efficiency sector was responsible for 57 percent of new clean energy jobs statewide over the past year and 66 percent of new job growth since 2014.

Much of the growth in statewide energy efficiency employment was due to job increases in the sector’s two largest sub-technologies—advanced building materials and efficient lighting technologies. Advanced building materials<sup>14</sup> workers comprised over half (54 percent) of the energy efficiency sector and grew by almost two percent over the previous 12 months. About another quarter of the energy efficiency labor force (26 percent) was employed across efficient lighting firms, and these jobs also grew by two percent, or 50 new workers. The remaining energy efficiency workers across ENERGY STAR® appliances, microgrid<sup>15</sup>, clean storage<sup>16</sup>, and smart grid<sup>17</sup> accounted for 20.2 percent of the energy efficiency workforce and created roughly 48 new jobs over the previous 12 months.

Microgrid technologies are a unique strength for Rhode Island. The sector supported a total of 451 jobs, accounting for two percent of all microgrid employment across the United States. Employment in this sector was also more concentrated in Rhode Island compared to the national average. OER has allocated \$1.5 million of RGGI funding for resilient, community-based microgrid projects which will be deployed in the fall of 2020. Microgrid workers accounted for five percent of the state’s energy efficiency labor force compared to only two percent nationwide, making these jobs 2.8 times more concentrated in Rhode Island compared to the national average. The increase in microgrid deployment due to additional RGGI funding is expected to result in additional microgrid jobs in 2020.

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<sup>13</sup> This is based on the Rhode Island-specific technology definition for energy efficiency.

<sup>14</sup> Advanced building materials includes “other” energy efficiency technologies in Figure 6, but seventy-one percent of growth in the “advanced building materials and other” sub-sector between 2019 and 2020 is attributable to advanced building materials specifically. “Other” energy efficiency includes variable speed pumps, other design service, software, energy auditing, rating, monitoring, metering, leak detection, policy or non-profit work, and consulting that cannot be specific to a detailed sub-technology.

<sup>15</sup> Microgrids are a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that act as a single controllable entity with respect to the grid.

<sup>16</sup> Clean storage includes pumped hydropower storage, battery storage, mechanical storage, thermal storage, and biofuel storage. Hydroelectric energy storage is used by electric power systems for load balancing. This method stores the gravitational potential energy of water pumped from a lower elevation reservoir to a higher elevation. Battery storage includes storage for solar generation and lithium batteries, lead-based batteries, other solid-electrode batteries, vanadium redox flow batteries, and other flow batteries. Mechanical storage includes flywheels and compressed air energy storage, while thermal storage is temporary storage of energy for later use when heating or cooling is needed.

<sup>17</sup> A smart grid is an electricity supply network that uses digital communications technology to detect and react to local changes in usage.

Renewable and efficient heating and cooling, the second largest component of Rhode Island's clean energy labor force, grew by 2.2 percent (93 new jobs) for a total of 4,385 workers. Eighty percent of this growth was attributable to traditional HVAC firms, which accounted for a third (33 percent) of the renewable and efficient heating and cooling labor force in Rhode Island.

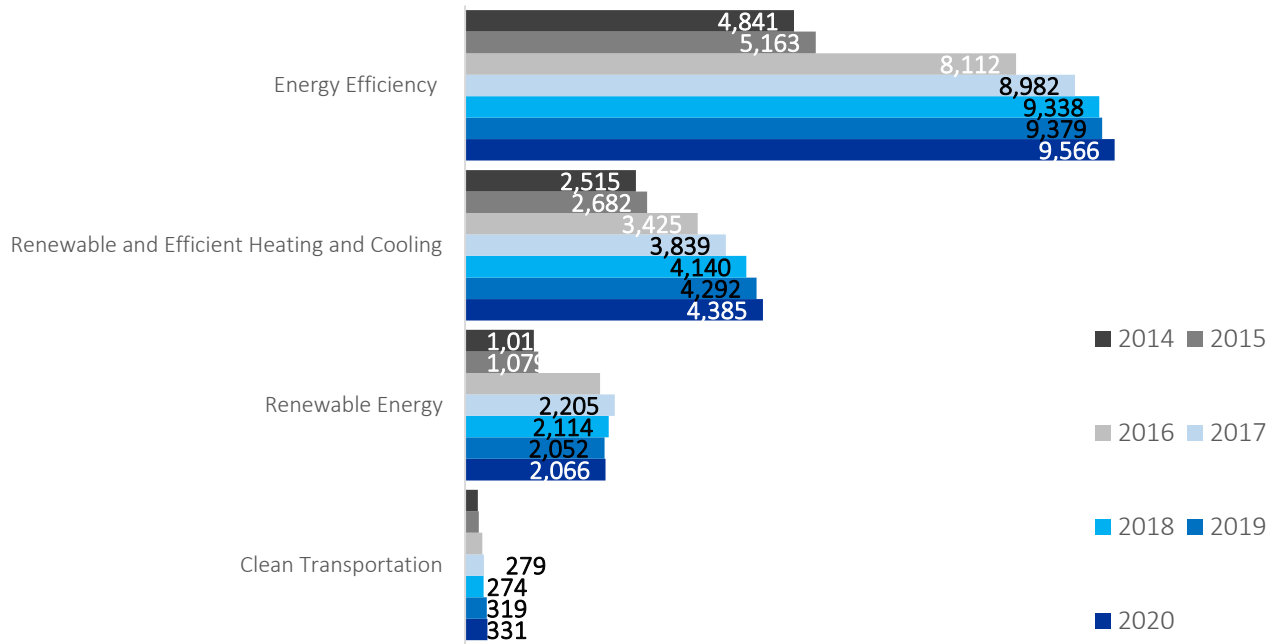
Wind energy employers also saw a very slight increase from 531 workers in 2019 to 538 workers in 2020. Since 2016, the wind energy workforce in Rhode Island grew by 14.8 percent, creating roughly 70 new jobs in five years. The construction of the new offshore wind energy project, Revolution Wind, is projected to create more construction jobs in this sector. In fact, initial job impacts are already underway as companies have begun locating their U.S. headquarters in the state. The state is anticipating new job creation in the offshore wind energy industry as this major project begins construction.

Renewable energy employment grew by about one percent over the previous year, while clean transportation employment grew by roughly four percent over the same time. However, this only translates to 12 new jobs in the clean transportation sector as it is quite small with about 330 employees. Solar firms saw employment rise again after a three-year decline between 2017 and 2019. In total, the solar industry accounted for 1,419 workers, a 2.8 percent growth or 38 more jobs compared to 2019. The solar industry rebound is mirrored across the nation, as U.S. solar jobs grew by 3.2 percent over the last 12 months.<sup>18</sup>

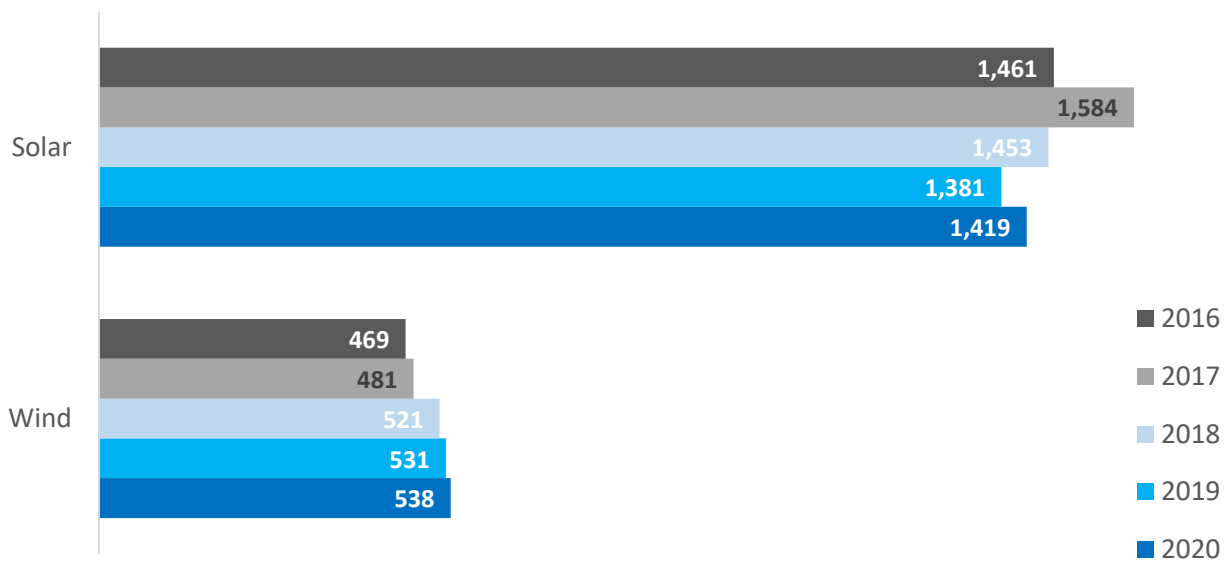
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<sup>18</sup> The Solar Foundation, National Solar Jobs Census 2019. [www.thesolarfoundation.org](http://www.thesolarfoundation.org).

**Figure 3. Clean Energy Employment by Technology, 2014-2020<sup>19</sup>**

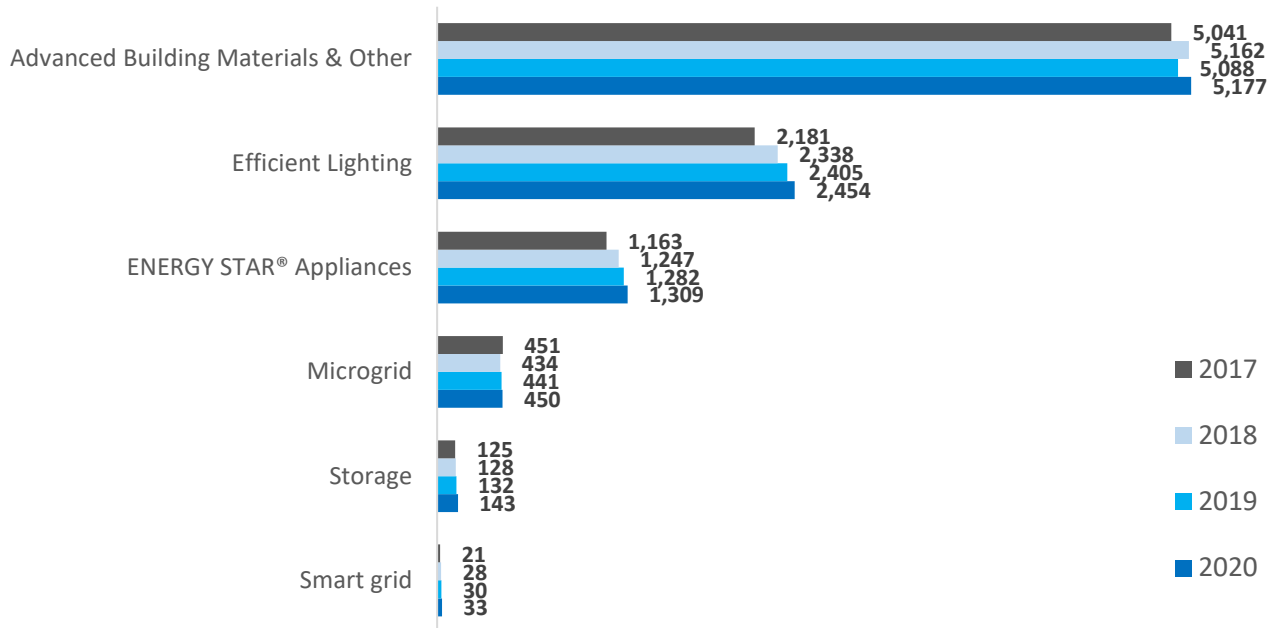


**Figure 4. Renewable Energy Generation Employment, 2016-2020**

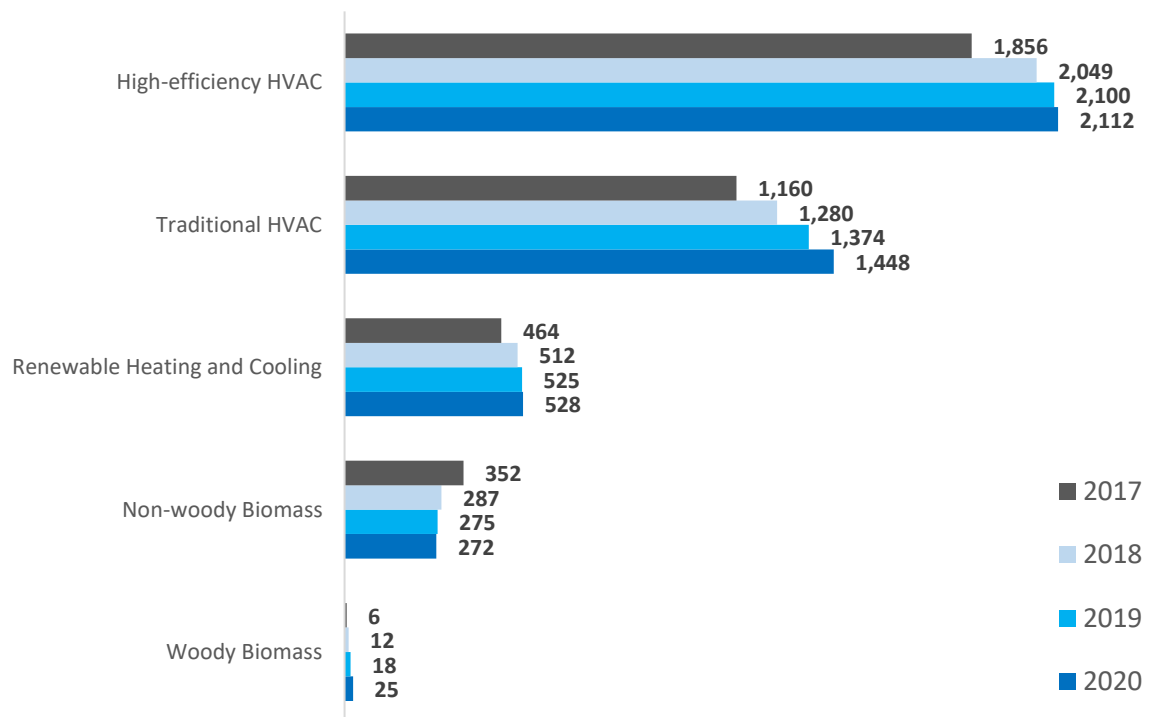


<sup>19</sup> Other employment totaled to 707 jobs in 2015 and 663 in 2014; improved methodologies have since allowed the research team to categorize all employment into a major technology. It should be noted that 2014 and 2015 employment will not sum to 9,219 and 9,832 respectively in this chart because the “other” category is not displayed. Additionally, 2014 employment by technology was retroactively extrapolated using 2015 employment data for this year’s report and thus will not be found in previous iterations of the Rhode Island Clean Energy Industry Report.

**Figure 5. Energy Efficiency Employment, 2017-2020<sup>20</sup>**



**Figure 6. Renewable Heating and Cooling Employment, 2017-2020**



<sup>20</sup> While microgrid, storage, and smart grid are typically included under the “transmission and distribution” or “clean grid and storage” sectors for USEER and other Clean Energy Industry Reports, they are included in the energy efficiency sector for this report per Rhode Island’s clean energy technology definition.



# Clean Energy Value Chain

Installation, maintenance, and repair is the dominant clean energy activity in Rhode Island. These workers represented 57 percent of the clean energy labor force and have seen steady employment growth since 2014. Since last year's Clean Energy Industry Report, this sector grew by 2.8 percent, creating an additional 258 jobs in 12 months. Since 2014, this value chain activity almost doubled in size, with a growth of 90 percent or 4,415 jobs. The large employment growth corresponds with increases in the intensity of renewable energy work as well as the increase in solar capacity additions. The proportion of renewable energy workers that spend 100 percent of their time on clean energy work increased steadily between 2014 and 2020, from 67.6 percent to 88 percent. At the same time, installed solar capacity for residential, non-residential, and utility applications grew from under 10 MW in 2014 to more than 60 MW in 2018.<sup>21</sup> The state was expected to surpass over 235 MW of installed solar capacity by the first quarter of 2020.<sup>22</sup>

Engineering, research, and professional services are also significant clean energy activities across the state. Companies in this value chain segment employed 3,187 workers—almost 20 percent of the clean energy workforce—and grew by 0.7 percent, or 21 jobs. Since 2014, this sector added 954 new jobs to the clean energy workforce, for a growth rate of 42.7 percent in seven years.

The remaining sectors comprised just under a quarter (23.3 percent) of Rhode Island's clean energy workforce. Wholesale trade and other sectors saw slight job growth, offsetting the minor job loss in manufacturing (-0.5 percent). Together these three sectors resulted in a net change of 48 new jobs.

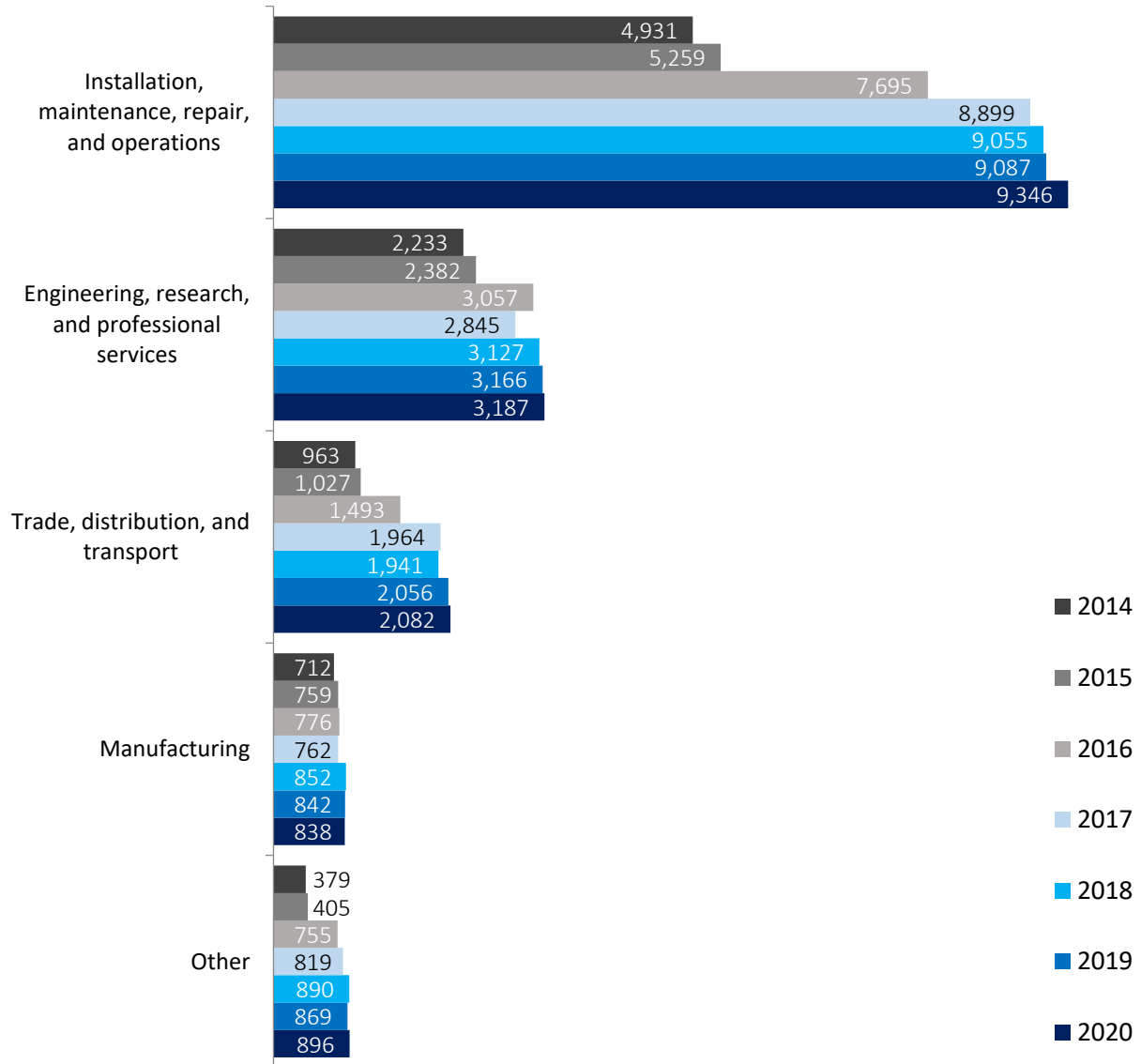
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<sup>21</sup> Solar Energy Industries Association. Rhode Island Factsheet. Q3 2019. Accessed on 9 March 2020.

<sup>22</sup> <http://www.energy.ri.gov/renewable-energy/governor-clean-energy-goal.php>. While the website highlights 300 MW, this number includes Long Term Contracts that have not yet been built.



**Figure 7. Clean Energy Employment by Value Chain, 2014-2020<sup>23</sup>**



<sup>23</sup> 2014 Value Chain employment retroactively extrapolated based on 2015 data

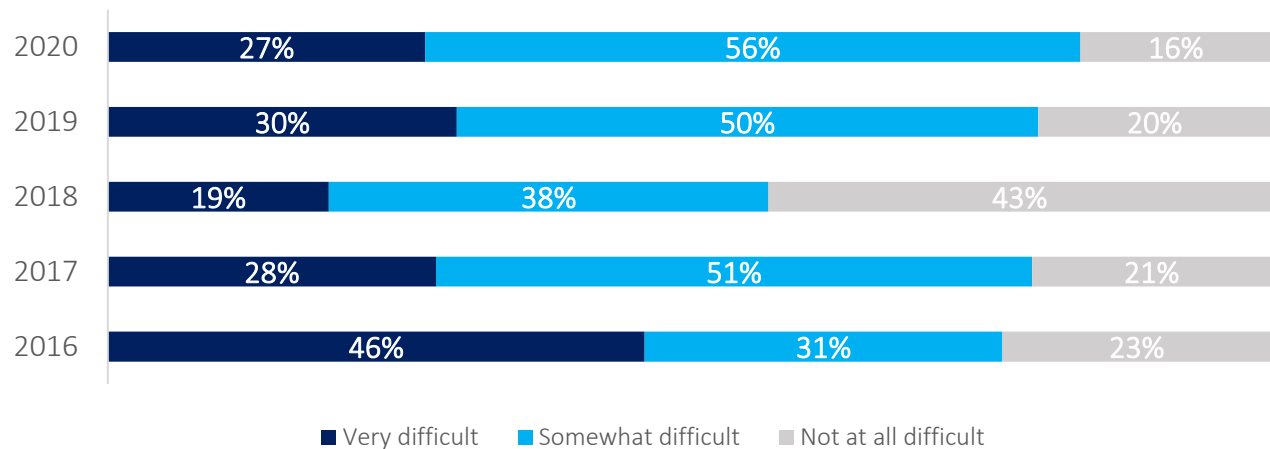
# Workforce



Clean energy employers were having difficulty finding qualified workers to fill their open positions. Hiring difficulty has been on the rise since 2018, following a two-year decline from 2016 levels. A collective 84 percent of surveyed clean energy businesses in Rhode Island found hiring to be at least somewhat difficult over the 12 months between the last quarters of 2018 and 2019—up four points from last year’s report. The proportion of employers who found hiring to be “very” difficult increased from 19 percent in 2018 to 30 percent in 2019 but has since declined to 27 percent in 2020. Overall, only 16 percent of employers reported no hiring difficulty. Of those employers that indicated hiring difficulty over the last year, the top three reasons for reported difficulty included lack of experience or training, a small applicant pool, and difficulty finding industry-specific knowledge or skills.

The sustained hiring difficulty over the last two years indicates that clean energy businesses were not able to grow at the rate they project due to lack of talent supply. However, given the new labor market realities due to COVID-19, 2020 projections are even less likely to come to fruition, indicating a deeper need for targeted workforce development support for the clean energy industry over the coming year.

**Figure 8. Hiring Difficulty, 2016-2020**



## Clean Energy Occupational Wages

The clean energy industry is a provider of sustainable-wage jobs for Rhode Island residents. Sales representatives, construction laborers, electricians, automotive service technicians, HVAC installers, team assemblers, and mechanical insulation workers in the clean energy industry earn higher entry-level wages than the corresponding statewide median for each occupation. This means an entry-level clean energy sales representative earns \$27.03 per hour in Rhode Island, which is 51 percent higher than the overall median wage for sales representatives across the state; this is highlighted in blue in the below two tables. These wage premiums are also available at higher experience levels for nearly all occupations listed below. An experienced electrician who is on the higher end of wage earnings makes \$45.57—highlighted in orange below—which is 18 percent above the statewide median wage for an electrician in Rhode Island.

**Table 1. Median Hourly Wages by Occupation, 2020**

	Renewable Energy Generation			Energy Efficiency		
	Entry	Mid	High	Entry	Mid	High
Sales Representatives	\$27.03	\$41.67	\$72.68	\$26.03	\$40.87	\$71.45
Construction Laborers	\$15.28	\$22.17	\$31.20	\$15.31	\$22.14	\$31.59
Electricians	\$21.46	\$34.17	\$45.01	\$21.49	\$34.14	\$45.57
Automotive Service Technicians	\$15.58	\$21.60	\$29.19	N/A	N/A	N/A
HVAC Installers	\$21.75	\$30.93	\$40.86	\$21.81	\$30.92	\$41.04
Team Assemblers	\$12.38	\$16.89	\$26.81	\$12.55	\$16.81	\$26.66
Mechanical Insulation Workers	\$19.79	\$29.56	\$42.23	\$19.82	\$29.53	\$42.75

**Table 2. Clean Energy Premiums by Occupation, 2020<sup>24</sup>**

	Renewable Energy Generation Premium			Energy Efficiency Premium		
	Entry	Mid	High	Entry	Mid	High
Sales Representatives	51%	31%	14%	45%	28%	12%
Construction Laborers	1%	-10%	-19%	2%	-10%	-18%
Electricians	42%	38%	17%	43%	38%	18%
Automotive Service Technicians	22%	1%	-9%	N/A	N/A	N/A
HVAC Installers	57%	37%	15%	58%	37%	16%
Team Assemblers	15%	8%	0%	16%	7%	-1%
Mechanical Insulation Workers	31%	20%	9%	32%	20%	11%

<sup>24</sup> Occupational wage data for Rhode Island by experience level was pulled from Emsi, Q4 2018.



## Conclusions

Clean energy activity in Rhode Island continues to be an active component of the statewide economy. Led by substantial increases in energy efficiency jobs, the clean energy sector has continuously shown above-average employment growth, creating sustainable-wage employment opportunities for the state's residents. Significant policy endeavors and investments are propelling the state towards an even cleaner energy future, with promise of a new offshore wind farm on the horizon and the continued rise of installed solar capacity.

In January of 2020, Governor Raimondo signed an executive order for an ambitious goal of 100 percent renewable electricity for Rhode Island by 2030. With this new goal in place, and other supportive policy initiatives, the state is well-poised to remain a national and global leader in clean energy job creation.

However, to continue support for clean energy business growth requires an understanding of employer needs as well as skill and certification requirements for in-demand clean energy positions. Additional efforts to better engage employers and create partnerships across training providers, businesses, utilities, and the state would help develop efficient talent pipelines, drawing on the strengths and resources of each group of stakeholders; such partnerships and sustained efforts to support the clean energy industry are especially important now in the wake of COVID-19.

## Appendix A: Geographic Distribution of Clean Energy Jobs

County	2016 Employment	2017 Employment	2018 Employment	2019 Employment	2020 Employment
Bristol County	444	638	439	457	466
Kent County	2,282	2,586	2,756	2,840	3,105
Newport County	1,313	1,603	1,461	1,515	1,501
Providence County	8,046	8,424	9,058	9,471	9,564
Washington County	1,690	2,054	1,762	1,738	1,748

## Appendix B: Survey Methodology

This year's Clean Energy Industry Report is based on the 2020 United States Energy and Employment Report (USEER). The 2020 USEER utilized data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (BLS QCEW 2019 Q2), as well as survey data. The survey was designed and implemented by BW Research Partnership, with management from Energy Futures Initiative (EFI) and the National Association of State Energy Officials (NASEO). For the past decade, national, state, and local energy-related data collection and analysis efforts have used this survey methodology.

The survey uses a stratified sampling plan based on industry code (North American Industry Classification System or NAICS), establishment size, and geography to determine the proportion of establishments that work with specific energy related technologies, as well as the proportion of workers in such establishments that work with the same. These data are then analyzed and applied to existing public data published by the BLS QCEW, effectively constraining the potential universe of energy establishments and employment.

The survey was administered by phone and by web, with 1,824 outbound calls (to 1,013 business establishments) and 85 emails sent to participants across Rhode Island. This year, survey invites were sent via mail to 186 business locations in Rhode Island. The phone survey was conducted by ReconMR with follow-up interviews by BW Research's in-house call center. The web instrument was programmed internally, and each respondent was required to use a unique ID in order to prevent duplication.

The sample was split into two categories, the known and unknown universes. The known universe includes establishments that have previously identified as energy-related, either in prior research or some other manner, such as membership in an industry association or participation in government programs. These establishments were surveyed census-style, and their associated establishment and employment totals were removed from the unknown universe for both sampling and for resulting employment calculations and estimates. Over the summer of 2019, BW Research cleaned, deduplicated, added to, and refined its database to reflect churn (companies out of business, moved, no longer in energy), unverified (no answer, answering machine, fast-busy, disconnect, etc.), verified, and other available demographic tags (industry, technology, sub-technology, size, etc.).

In addition to cleaning the original known energy database, BW Research also supplemented with industry association contact lists by technology (biofuels, coal, oil, and gas, energy storage, energy efficiency, solar, and wind), new companies from the unknown database that took the 2019 survey, and contact lists from subcontractors. BW Research also appended contact information, including six-digit NAICS codes, contact, employment, and location information.

The unknown universe includes hundreds of thousands of businesses in potentially energy-related NAICS codes, across agriculture, mining, utilities, construction, manufacturing, wholesale trade, professional services, and repair and maintenance. Each of these segments and their total reported establishments (within the BLS QCEW) were carefully analyzed by size (employment – provided by the Census Bureau's County Business Patterns) and state to develop representative clusters for sampling.

In total, 105 business establishments in Rhode Island participated in the full survey effort (a response rate of 8.7%). Another 408 establishments provided information (no to "energy involvement"). These responses were used to develop incidence rates among industries (percent "clean" vs percent "not clean") as well as to apportion employment across various industry categories in ways currently not provided by state and federal labor market information agencies. The margin of error for incidence is +/- 4.12 percent for Rhode Island at a 95 percent confidence interval. The margin of error for responses to the full survey is +/- 9.04 percent at a 95 percent confidence interval.

With clean data files in place, BW Research developed a general methodology for state employment estimation that has a few variations depending on sub-technology. Steps in the process are listed below.

**100% NAICS A**

These are NAICS codes where 100% of the reported employment is energy related AND 100% are allocated to a specific sub-technology. Examples include solar electric power generation, hydroelectric power generation, and motor vehicle manufacturing.

**Actual Survey Responses**

These include the reported sub-technology employment totals by company location. Responses from establishments in 100% NAICS codes are excluded.

**Known Database**

Employment is allocated by location for verified establishments in the known when the following conditions are met: 1) Have InfoUSA or DatabaseUSA appended data; 2) did not take survey (or actual survey response would be used), and 3) are not in a 100% NAICS.

**Remainder**

This represents remaining employment based on statistical extrapolation.

**Industry Mix**

Industry mix is the national proportion of industries that contribute to sub-technology employment. The mix of these industries (by 6-digit NAICS) is used to create proportions by state and remainder employment is allocated by these proportions. This “industry mix” was developed by analyzing completed survey incidence nationally for all clean energy sub-technologies over five years.

BW Research provided additional analysis of the publicly released Department of Energy data that included data from the Bureau of Labor Statistics, the Energy Information Administration, the U.S. Census Bureau, Emsi, the BW Research Partnership Energy Employment Index, historical data from prior Rhode Island Clean Energy Industry Reports. Of important to note, the USEER excludes any employment in retail trade NAICS codes—motor vehicle dealerships, appliance and hardware stores, and other retail establishments.

For more details on the USEER methodology, please see: <https://www.usenergyjobs.org/>.