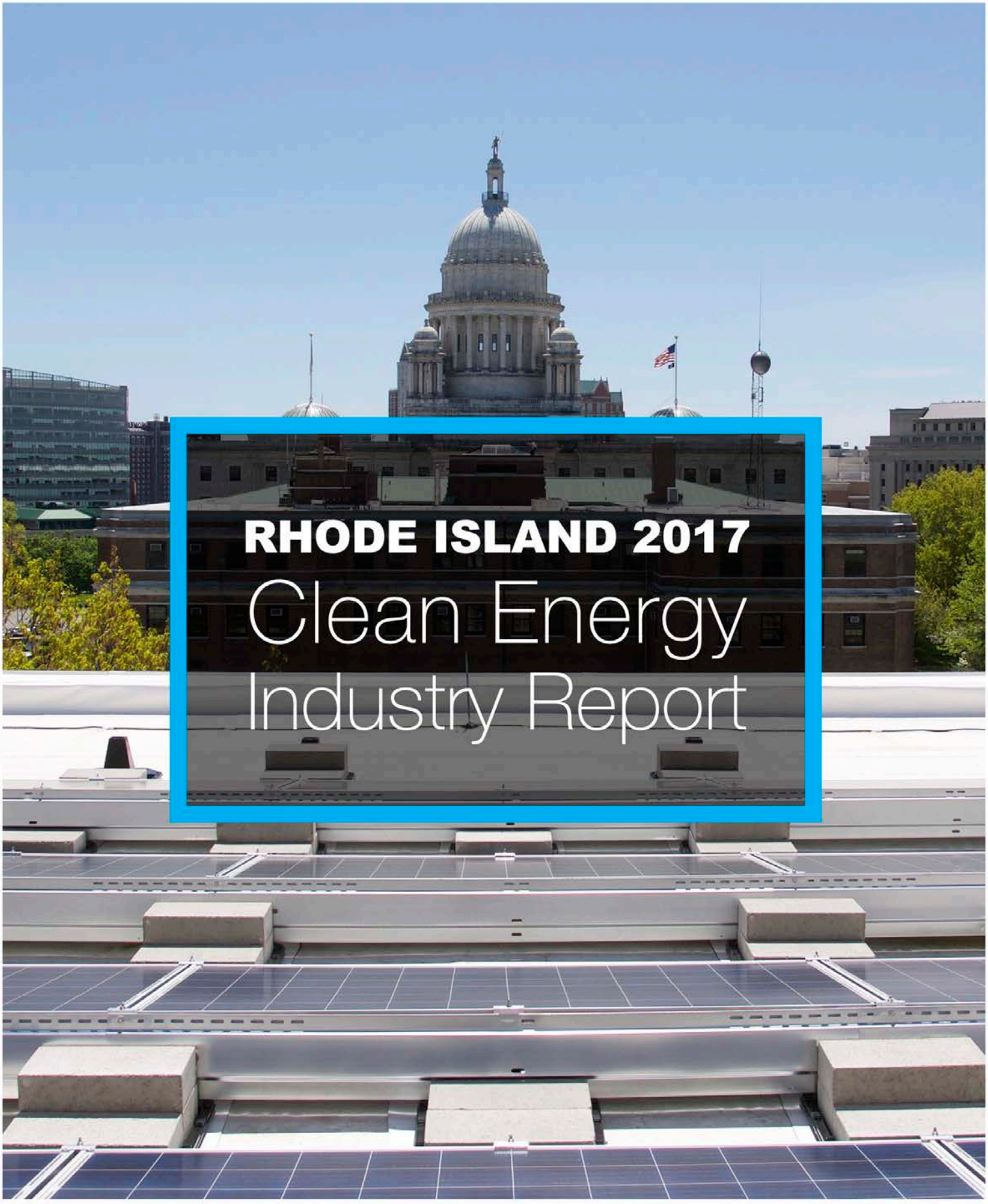


RHODE ISLAND 2017
Clean Energy Industry Report

[bw] RESEARCH PARTNERSHIP

Letter

The Rhode Island Office of Energy Resources (OER) and the Executive Office of Commerce are excited to present the 2017 Rhode Island Clean Energy Jobs Report. Governor Gina M. Raimondo and the General Assembly continue to implement policy that has resulted in continuous growth throughout Rhode Island's clean energy economy.

On March 1, 2017, Governor Raimondo announced a new goal of 1,000 MW and 20,000 clean energy jobs by 2020. The state is rapidly moving toward this goal, as the 2017 Clean Energy Industry Report counts more than 15,000 clean energy workers across the Ocean State. Clean energy employment has grown by 66 percent since 2014, and an impressive 11 percent over just the last year.

The state is home to a diverse set of clean energy technologies, including energy efficiency, renewable heating and cooling, renewable energy generation and clean transportation; each of these major technologies increased employment by at least 10 percent over the last 12 months, indicating that clean energy is a major catalyst for job creation across Rhode Island's economy. Solar firms alone grew employment by 16 percent over the last 12 months, amounting to almost 1,700 solar workers across the state. Moreover, wind energy now employs just more than 500 workers, for a growth rate of 10 percent over 2016.

The state's largest clean energy sector is energy efficiency, with almost 9,000 workers across the state. Ranked fourth in the nation for energy efficiency policy and program efforts, Rhode Island is reaping the benefits as traditional construction sectors bring in new revenue streams from clean energy-related business. The distribution of energy efficiency activity across the state's clean energy economy is evidenced in the high proportion of installation firms, who support the majority of clean energy employment; these establishments report employment growth of 16 percent over the last 12 months.

An important trend to note is that the state's clean energy economy is expanding its borders as establishments increase in size. In 2017, more than two in five clean energy establishments are medium-sized employers with six to 24 clean energy workers — an 18-point increase over the last 12 months.

Moreover, the state's clean energy supply chain is becoming localized while firms expand their customer base. Employers who report primarily in-state vendors increased by 11 percentage points while out-of-state or international clients increased by 2 percentage points. The increase in in-state vendors comes alongside a 32 percent growth in trade, distribution and transport employment, indicating that growth in the local supply chain permeates across the state's economy in both employment and export growth.

OER is also supporting clean energy legislation before the General Assembly this legislative session that will continue to advance the state's clean energy economy:

- **Statewide Solar Electrical/Building Permit –** streamlining the electrical and building permits at the local level to have one statewide solar permit application process beginning in 2018.

- **Extension and Expansion of the Renewable Energy Growth Program –** expanding the state's renewable energy program that has enabled homeowners, businesses, farmers and municipalities to pursue renewable energy projects.

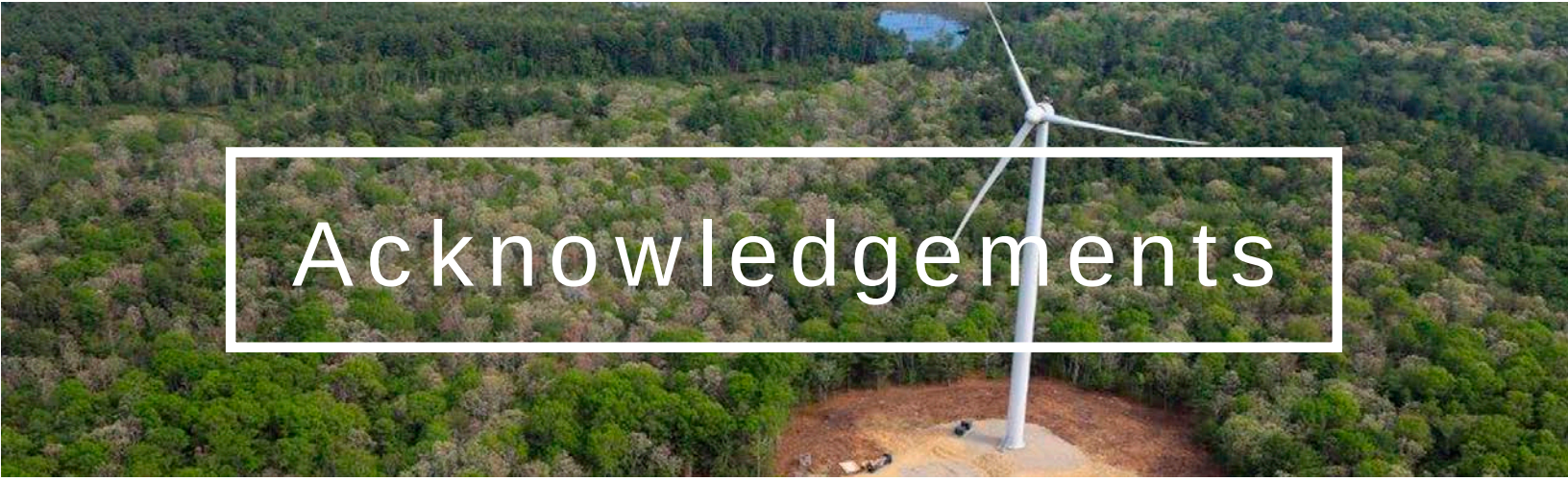
- **FY2018 State Budget – Article 19 Electric Vehicle Rebate Program –** continue the state's successful electric vehicle rebate program, which helps reduce the cost for Rhode Island residents purchasing electric vehicles at car dealerships across the State.

The State's policy efforts will continue to build out the state's strong solar and traditional energy efficiency sectors, while fostering expansion across more nascent technologies such as storage and smart grid. We are thankful to Governor Raimondo and the General Assembly for helping to make Rhode Island a leader in clean energy and continuing to foster growth across this sector of our local economy. Dedicated investment and policy support have set the stage for the Ocean State to become a major player in national and global clean technology spheres. We are excited to see what continued leadership and commitment brings for our state and its citizens.

Sincerely,

Carol Grant
Commissioner
Office of Energy Resources

Stefan Pryor
Rhode Island Secretary of Commerce



Acknowledgements

The 2017 Rhode Island Clean Energy Industry Report is the third installment of the compilation of data and survey results from clean energy employers across the state. This work could not be completed without the collaboration and support of many stakeholders, state agencies, the RI General Assembly, and the Office of Governor Gina M. Raimondo. The Rhode Island Office of Energy Resources and the Executive Office of Commerce would like to thank all the stakeholders who helped with the preparation and coordination associated with this report. Also, thank you to the respondents of the survey which resulted in the data this report summarizes. Our partners could only gather this data because each respondent's willingness to share their time and insights.

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Carlota Santos
Jeffrey Sabo
Veronica Williams
Philip Jordan
Josh Williams

Rhode Island Office of Energy Resources Staff

Shauna Beland
Danny Musher
Carol Grant
Chris Kearns
Nick Ucci
Robert Beadle

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William Ash
Chris Cannata

Senator William Walaska

Rhode Island Senate

1995 – 2017

The 2017 Clean Energy Industry Report is dedicated to the memory of Senator Walaska, who was a strong advocate during his time in the Senate in sponsoring and advancing renewable energy and energy efficiency legislation.

EXECUTIVE SUMMARY

Now 15,305 jobs strong, Rhode Island's clean energy economy continues to demonstrate robust economic growth. Since 2014, clean energy employment in the Ocean State has grown by an impressive 66 percent and 11 percent over just this past year. Over the last 12 months, 82 percent of employment growth, or roughly 1,300 jobs, can be attributed to newly created positions all across the Ocean State.

As with previous installments of Rhode Island's Clean Energy Industry Reports, energy efficiency remains the largest portion of the state's clean energy employment. It accounts for 59 percent of all clean energy jobs, or a total of almost 9,000 workers. The remainder of employment consists of renewable heating and cooling or renewable energy generation, which respectively account for 25 and 14 percent of total sector employment. The smallest segment of the clean energy economy, clean transportation, supports almost two percent of total employment. Each of these major technologies grew by at least 10 percent over the last 12 months.

A closer analysis of the 11 percent growth across the renewable generation sector reveals that solar and wind employment are rapidly growing across the state. With a growth rate of 16 percent over the last 12 months, Rhode Island's solar firms now employ almost 1,700 workers. Complimenting this growth, wind firms now employ just over 500 workers, for a growth rate of 10 percent over 2016.

Rhode Island's renewable energy deployment market is largely comprised of small-scale, distributed generation. As a result, nearly half of all clean energy firms report that installation, maintenance, or repair is their primary value chain activity. Installation firms grew employment by 16 percent over the last 12 months. At the same time, trade firms reported a 32 percent employment growth, as the number of employers that reported primarily in-state suppliers increased by 11 percentage points.

This year's study identified important economic trends with regards to Rhode Island's firm size, supply chain, and industry specialization. Rhode Island's cluster of clean energy firms are undoubtedly growing. More than two in five (42 percent) clean energy firms in the state reported that they employ six to 24 workers, which is 18 percentage points higher than 2016 findings. The number of smaller firms that employ one to five workers fell by 16 points. In conjunction with the growth of clean energy firms, the state's supply chain is showing more localization with slight expansion. Since 2016, in-state vendors increased from 32 to 43 percent.

Furthermore, the proportion of employers that serve out-of-state or international clients increased by two percentage points. Lastly, this year's data suggests that Rhode Island's clean energy economy is expanding to include more firms that are beginning to offer clean energy goods and services, with more firms in 2017 reporting that they receive a quarter to half or less than a quarter of their revenue from clean energy goods and services compared to 2016.

Rhode Island's clean energy labor supply was also a prominent focus of this latest report. Nearly 80 percent of employers reported that hiring was either "very" or "somewhat" difficult over the last 12 months. However, the number of employers that reported hiring was "very" difficult declined from 46 to 28 percent compared to 2016. Employers listed a number of reasons that contribute to hiring difficulty, including cost of living, competition, and a small pool of college graduates.

In a relatively short period, Rhode Island has become a model for clean energy transition and the economic growth that can be gained with a commitment to sustainability. The current energy landscape in Rhode Island is extremely promising with wind and marine-related renewable innovation defining the state's future clean energy profile. While this report reinforces the notion that Rhode Island's clean energy future is bright, it must be noted that many factors affect the growth and price of renewable energies. Future, short-term fluctuations in the demand for renewables might be triggered by external market forces such as declining fossil fuel prices. However, with policy expansions and the recently proposed goal of 1,000 MW and 20,000 clean energy jobs by 2020, the smallest state in the nation is undoubtedly poised to become a big player in the future of clean energy technologies.

Industry Overview

Employment Growth

A note about clean energy workers:

Employment data for this report captures all employees from qualifying clean energy firms that spend ***any portion of their time*** supporting the research, development, production, manufacture, distribution, or installation of clean energy products and services. This includes support services such as consulting, finance, tax, and legal services related to clean energy technologies.

As such, employment totals in this report should not be equated to Full-Time Equivalents (FTEs), but instead taken as a total quantification of the state's clean energy economy. To better understand labor intensity, survey data provides both a 50 percent and 100 percent employment threshold for workers that spend at least half of their time and those that spend all of their time supporting the clean energy portion of business. This year, survey data indicates that 89 percent of renewable energy generation workers and 63 percent of energy efficiency workers spend at least half of their time supporting energy efficiency business activities, while 78 and 61 percent of renewable energy and energy efficiency workers respectively spend all of their time on renewable energy-related work.

It is also important to note that employment data excludes any retail employment—gasoline stations, fuel dealers, motor vehicle dealerships, appliance and hardware stores, and other retail establishments.

Clean energy employment has grown by 66 percent since 2014.

Since the first installment of Rhode Island's Clean Energy Industry Report, the Ocean State has continued to display a firm commitment to clean energy deployment. Governor Gina Raimondo and the General Assembly have supported diligent research, careful policy design, effective incentive creation, and increased industry concentration in order to lead Rhode Island's economy toward a future of sustainable energy. In the most recent *U.S. Clean Tech Leadership Index* in 2017*,* Rhode Island was ranked 12th overall and is positioned to break the top ten in the near future. This position displays rapid improvement when compared to the 2013 *U.S. Clean Tech Leadership Index* where Rhode Island placed 17th in the nation. In addition, the Index ranks Rhode Island second overall for clean energy jobs as a percentage of total workforce.[1] With regards to energy efficiency policy and program efforts, the American Council

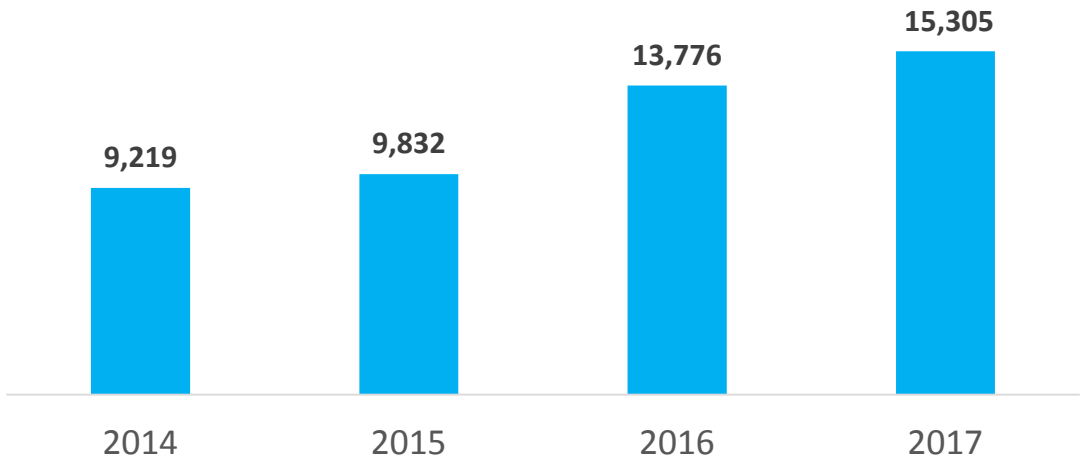
[1] 2013-17 U.S. Clean Tech Leadership Index, CleanEdge, Inc.

for an Energy Efficient Economy (ACEEE) ranked Rhode Island an impressive 4th amongst all 50 states in 2016.[2]

Sustained policy and incentive support has launched Rhode Island to the top of renewable energy source procurement ranks. The *2017 Corporate Clean Energy Procurement Index* ranked Rhode Island 10th in the nation. This index ranks all 50 U.S. states based upon the ease with which companies can obtain renewable energy for their operations located within their respective state. The index consists of 15 indicators, broken into three categories: utility purchasing options, third-party purchasing options, and onsite/direct deployment options.[3] Moreover, further accessibility in renewable energy procurement has been allowed through the various financial incentives put in place by the state and federal government. These include but are not limited to rebates, corporate tax deductions/credits, personal tax credits, and grant/loan programs. To date in 2017, Rhode Island boasts 48 policy programs or financial incentives that support the state's clean energy industries, including renewable energy, energy efficiency, and electric vehicles.[4]

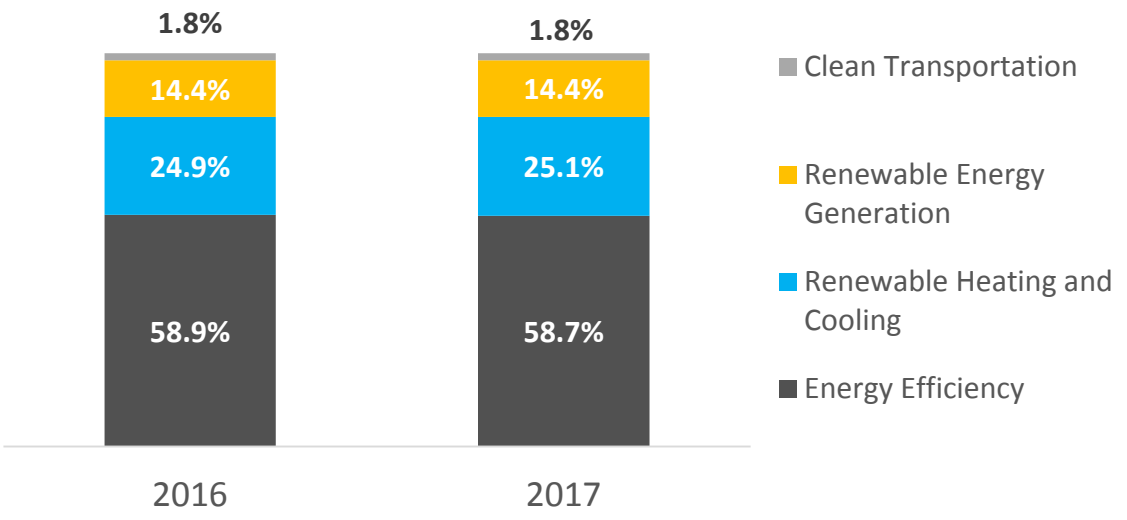
Due to legislative and policy support, the state has seen clean energy employment grow by an impressive 66 percent since 2014 and 11 percent over the last 12 months; 82 percent, or 1,253 jobs, of total employment growth is attributable to newly created positions, while the remaining 18 percent of workers are existing employees with added clean energy-related responsibilities. Rhode Island's clean energy economy now supports just over 15,000 workers across the state. The majority of employment is found across energy efficiency firms, followed by renewable and efficient heating and cooling technologies, such as traditional and high-efficiency HVAC and woody or non-woody biomass.

Figure 1. Clean Energy Employment Growth, 2014-2017



[2] 2016 State Energy Efficiency Scorecard (http://database.aceee.org/state/rhode-island)
[3] 2017 U.S. Clean Energy Procurement Index (https://cleanedge.com/reports/Corporate-Clean-Energy-Procurement-Index)
[4] DSIRE Programs (http://programs.dsireusa.org/system/program?fromSir=0&state=RI)

Figure 2. Clean Energy Employment by Technology, 2016-2017



All technology segments increased employment by at least 10 percent.

The current energy landscape in Rhode Island can be traced back to legislation in 1996, when the Utility Restructuring Act created the first public benefits fund in the nation.[5] This was the first of many initiatives dedicated to the state's clean energy future, the other most influential being the Rhode Island Renewable Energy Fund (RIREF). RIREF provides grants and loans for renewable energy projects with the potential to make electricity in a cleaner, more sustainable manner, while stimulating job growth in the green technology and energy sectors of Rhode Island's economy. The initial grant was specifically aimed at supporting the state's clean energy economy in four key areas: small-scale solar, commercial development, pre-development feasibility studies, and early-stage commercialization.[6]

More recently, in 2014, the Rhode Island General Assembly created and passed the Renewable Energy Growth Program (REG). It was designed to provide long-term performance-based incentives for small- to large-scale renewable energy projects that promote smart grid innovation. The program life was set at 5 years with a projected energy generation target of 160 MW.[7] Furthermore, the state established the Rhode Island Infrastructure Bank (RIIB) in the FY2016 Rhode Island State Budget. This organization finances clean energy projects in both the public and commercial sectors, spurring energy cost reductions and local job creation. It was passed along with an extension of the state's Least-Cost procurement law.[8]

[5] Database of State Incentives for Renewables and Efficiency, US Department of Energy May 2015
[6] Rhode Island Commerce Corporation (http://commerceri.com/finance-business/renewable-energy-fund/?)
[7] Database of State Incentives for Renewables and Efficiency, US Department of Energy, August 2015
[8] http://www.ginaraimondo.com/sites/ginaraimondo/files/gina-raimondo-infrastructure-plan.pdf

Beginning in 2010, with the creation of the Oceanic Special Area Management Plan (SAMP), wind has become a main focus for renewable energy planning and investment in Rhode Island. The Providence-based firm Deepwater Wind completed the United States' first offshore wind farm positioned off the coast of Block Island in December 2016 – a five-turbine, 30 megawatt project that created over 300 jobs for Rhode Island's economy. The project has and will continue to spur economic industrial growth by utilizing Rhode Island ports like Block Island, Galilee, Quonset Point and Providence for importation. Manufacturing of the turbines has also played a large part in revitalizing one of Rhode Island's historic industrial centers, Quonset Business Park.[9]

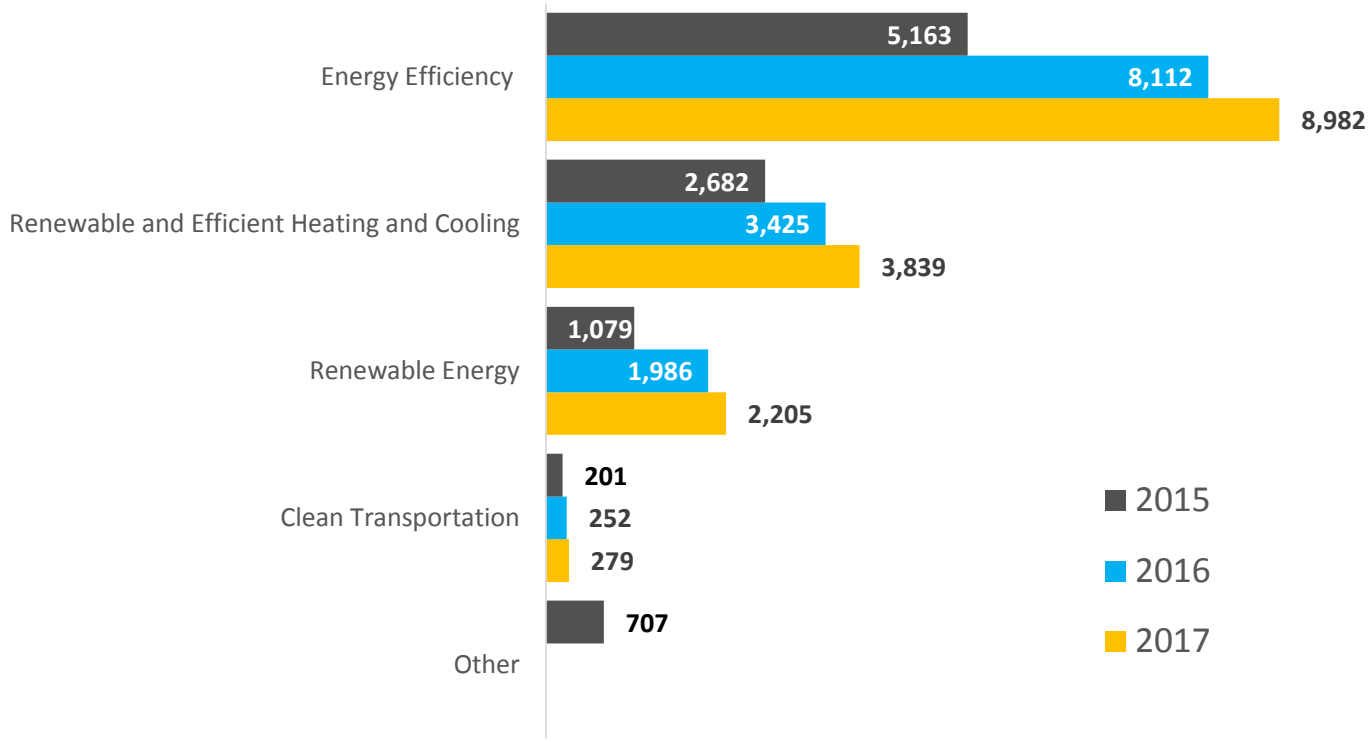
Even on the federal level, Rhode Island has been identified as a location where offshore wind energy will be a significant portion of the clean energy industry. The Bureau of Ocean Management (BOEM) and the Department of Interior (DOI) have been making significant progress in planning an Area of Mutual Interest (AMI) in federal waters between Rhode Island and Massachusetts for future federal offshore wind projects that will benefit the Ocean State's energy needs. This planning includes design of the federal offshore wind auction and leasing process, in coordination with the Governor and Congressional Delegation.[10]

Distributed generation policy support has led to continuous employment gains in this sector of Rhode Island's clean energy industry. Though Renewable Energy Generation only accounts for 14 percent of the state's clean energy economy, firms have grown employment by 11 percent over the last 12 months, with the majority of growth coming from solar firms. These firms now employ a total of 1,691 workers, up from last year's 1,461 employees—a growth rate of about 16 percent.[11] Wind firms support 514 workers, growing at a rate of just under 10 percent.[12]

Energy Efficiency technologies remain the bulk of clean energy-related work, with a total of 8,982 workers; the sector also grew by 11 percent over the last 12 months. Energy efficiency is followed by Renewable and Efficient Heating and Cooling, which supports about a quarter of total employment and grew by 12 percent since 2016. Clean transportation firms grew by almost 11 percent over 2016, though this only translates to about 30 additional workers.

[9] Deepwater Wind Inc. (http://dwwind.com/project/block-island-wind-farm/)
[10] State of Rhode Island Office of Energy Resources (http://www.energy.ri.gov/renewable/)
[11] Please note that solar employment in this report will not match what was reported in USEER 2017. The Rhode Island 2017 report revised employment estimates in order to provide a full annual comparison from Q2 2015 through Q2 2016; data reported in USEER 2017 is for Q1 2016.
[12] Upon second review, wind employment reported in the state reports for USEER 2017 was inflated. As a result, the research team used employer-reported past growth to extrapolate 2017 employment based on 2016 extrapolations.

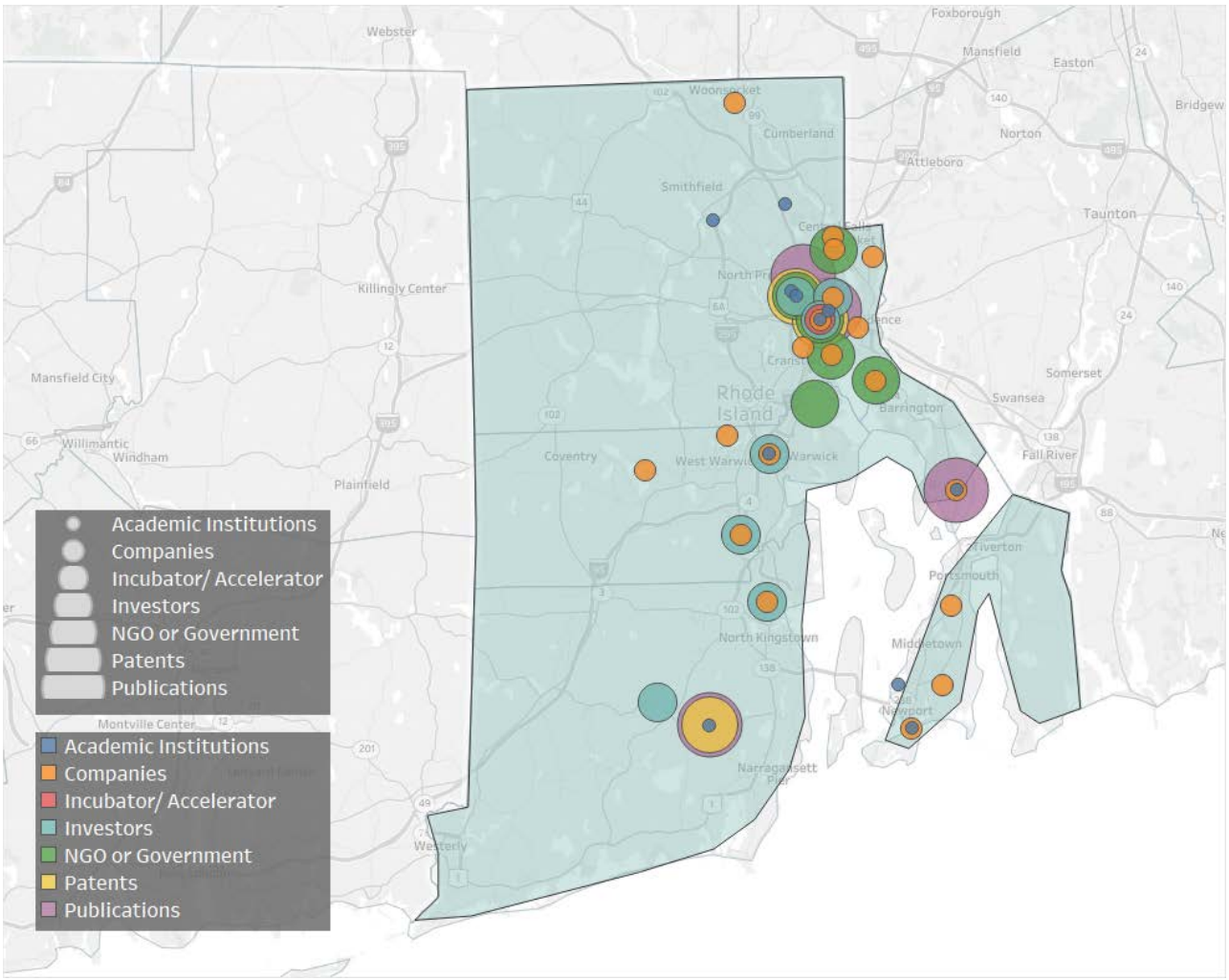
Figure 3. Clean Energy Employment Growth by Technology, 2014-2017



Clean Energy Innovation

Clean energy innovation is centered around academic institutions in Providence.

Rhode Island has a healthy clean energy innovation economy, with academic institutions, start-up companies, incubators, investors, and public agencies supporting clean energy publication and patent growth. Not surprisingly, this activity is largely centered around Providence, where the majority of the state's 13 academic institutions are concentrated. Another emerging center of patent and publication activity is around the University of Rhode Island along the southern coast of the state. Over the last five years, the state has filed 11 patents and published 43 scholarly articles related to clean energy technology and innovation.



Clean Energy Value Chain

Installation firms dominate Rhode Island's clean energy economy.

Rhode Island's renewable deployment market is largely comprised of small-scale, distributed development. The Distributed Generation Contracts Program (DGCP) was first launched in 2011. The program required National Grid to enter into 15-year renewable energy contracts with private landowners, businesses, and municipalities at a set and fixed price. Currently, wind, solar photovoltaic, and anaerobic digestion technologies are eligible to participate in the DG program.[13] The program has structured and eased market entry for renewable energy companies looking to produce sustainable energy for Rhode Island's consumers. In addition to DGCP, the state has a Renewable Energy Growth Program (REG), which allows customers to sell

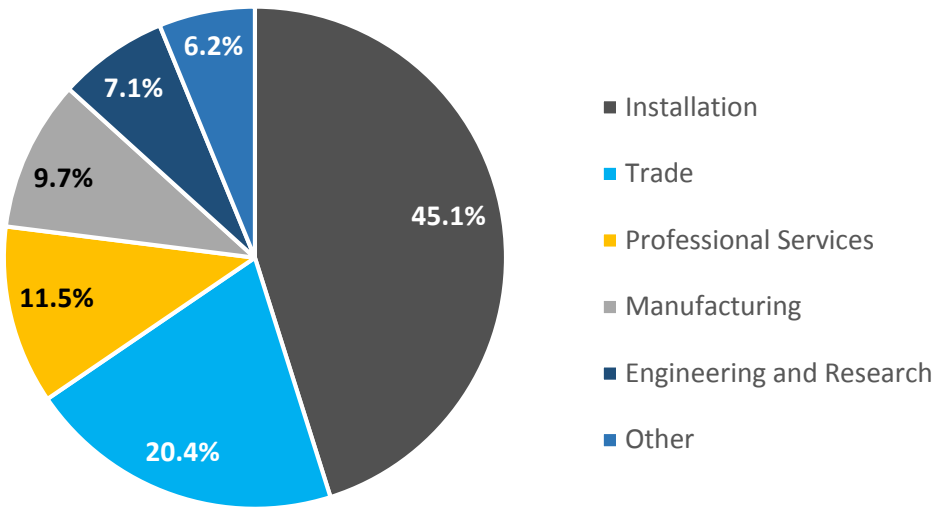
[13] State of Rhode Island Office of Energy Resources (http://www.energy.ri.gov/renewable/)

their clean energy output under long-term tariffs at fixed prices; the program is available for both small-scale and large-scale projects for solar, wind, hydroelectric, and anaerobic digester technologies.[14]

As a result, almost half of firms (45 percent) report that installation, maintenance, or repair is their primary value chain activity, followed by trade at about two in ten firms and professional services at 12 percent of establishment activity. The state also has significant representation in the manufacturing sector, with one in ten employers reporting manufacturing as their primary activity.

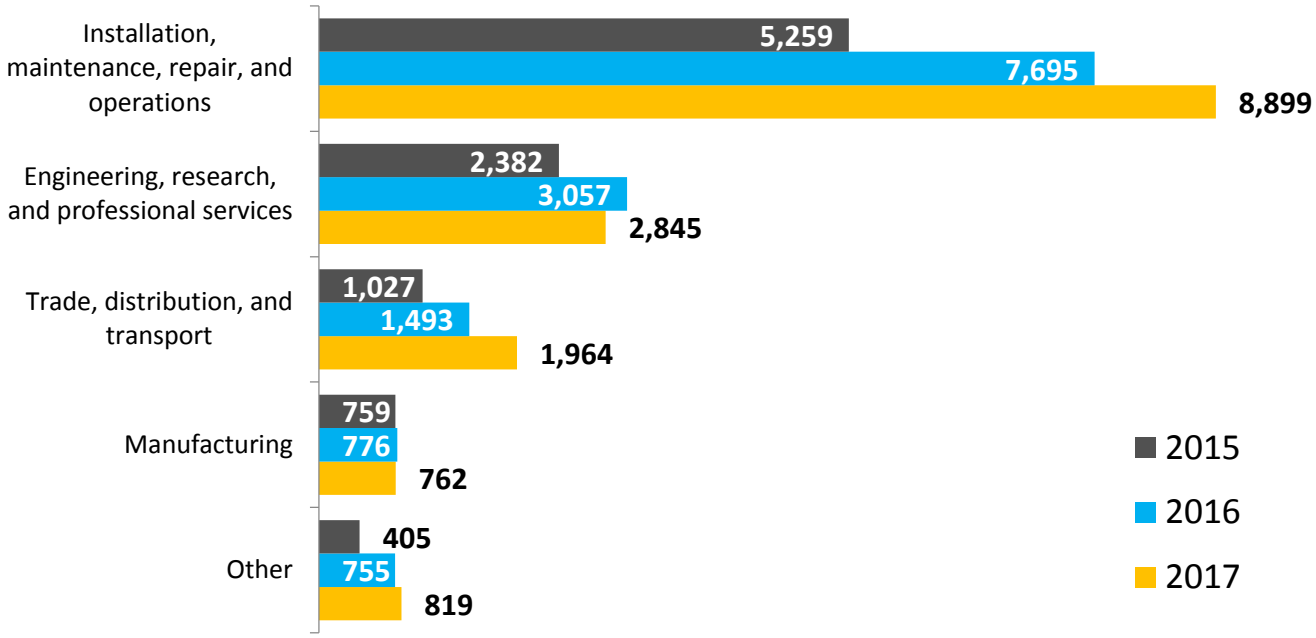
Rhode Island's clean energy installation firms have increased employment by 16 percent over the last 12 months. Trade and distributions firms saw impressive growth of at 32 percent, likely due to the marked increase in in-state vendors and suppliers; forty-three percent of employers note that their suppliers are located primarily within the state—an 11 percent increase compared to 2016 (See Figure 7). Utility companies employ fewer than 50 clean energy employees, but for confidentiality purposes the report cannot detail total employment.

Figure 4. Clean Energy Establishments by Value Chain, 2017



[14] National Grid (https://www9.nationalgridus.com/narragansett/business/energyeff/4_dist_gen.asp)

Figure 5. Value Chain Employment Growth, 2015-2017

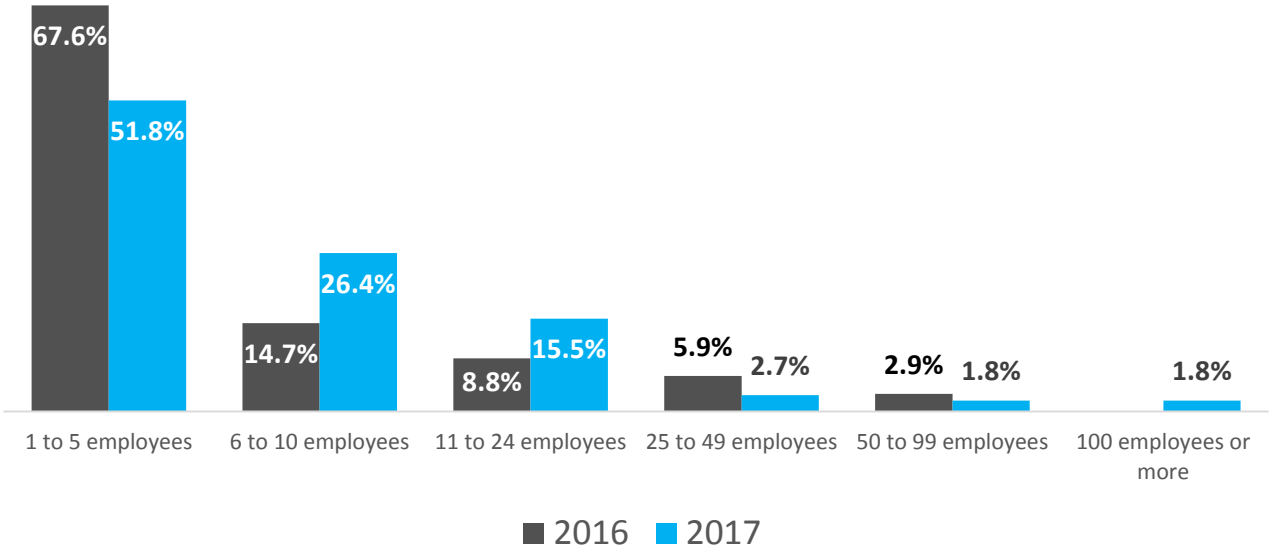


Clean Energy Market

Rhode Island's small businesses are growing to medium-sized establishments.

In 2017, more than two in five (42 percent) clean energy establishments are medium-sized firms with six to 24 employees, an 18-percentage point increase since 2016.

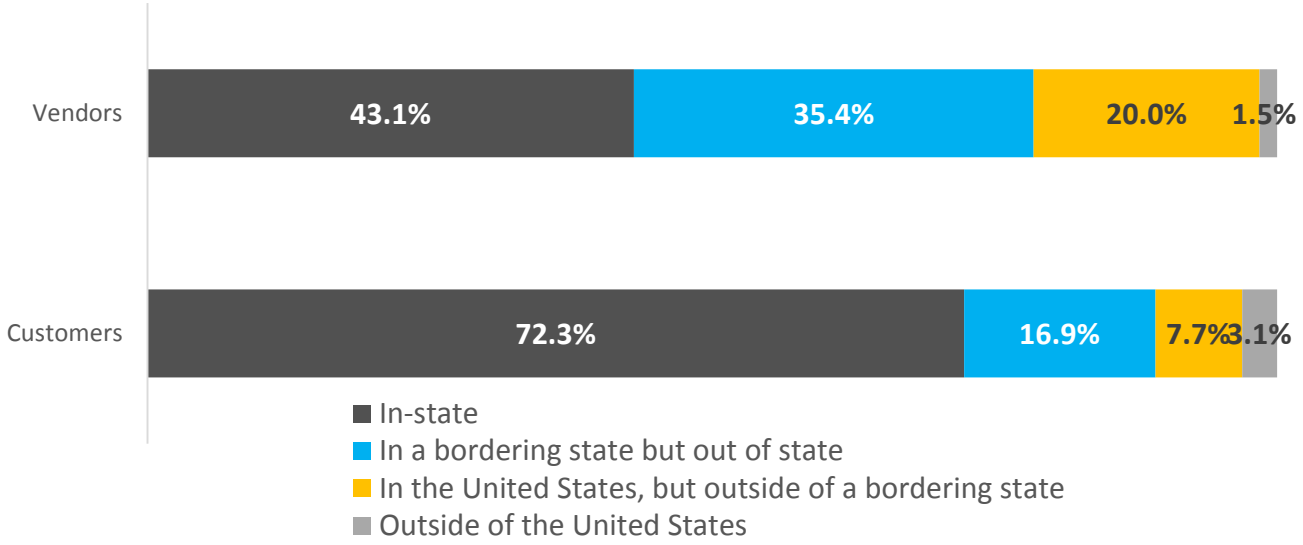
Figure 6. Clean Energy Establishment Size, 2016-2017



Rhode Island's supply chain has become more localized.

Eight in ten employers (79 percent) report that their primary suppliers are from Rhode Island or a bordering state, compared to only 56 percent last year. In-state vendors increased from 32 to 43 percent over the last 12 months. At the same time, the clean energy economy has expanded its borders as the proportion of employers that serve out-of-state or international clients increased by two percentage points.

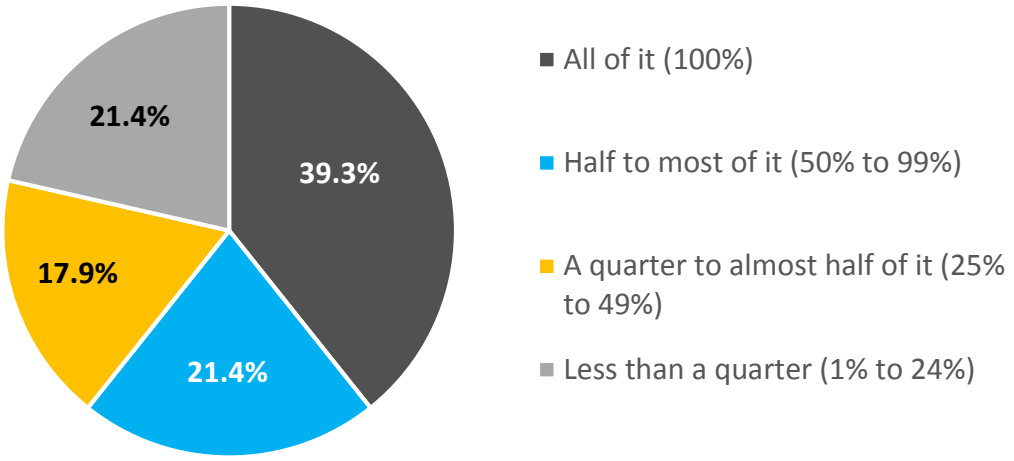
Figure 7. Customers and Vendors, 2017



The state's clean energy economy continues to penetrate traditional industries.

The proportion of employers that report receiving half to all of their revenue from clean energy goods and services declined from 76 to 61 percentage points between 2016 and 2017. Despite this, employers that report receiving all of their revenue from clean energy-related business only declined by two percentage points over the last 12 months.

Figure 8. Clean Energy Revenue, 2017



Clean Energy Workforce

The labor supply does not sufficiently meet employer demands.

Traditional clean energy occupations include electricians, laborers, first-line supervisors, roofers, and sales representatives with median hourly wages of approximately $25 (8% higher than the state's median hourly wage for all occupations). The majority of workers within these occupations are between 35 to 54 years old, followed by 34 years old or younger, and 55 years old and older.

Table 1: Traditional Clean Energy Occupations

Description	Median Hourly Earnings	Age 34 or younger % of Occupation	Age 35-54 % of Occupation	Age 55 + % of Occupation
Electricians	$24.77	31%	48%	20%
Laborers	$18.29	35%	50%	15%
Plumbers, Pipefitters, and Steamfitters	$23.59	32%	50%	18%
First-Line Supervisors of Construction Trades and Extraction Workers	$32.43	16%	57%	28%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	$26.98	31%	51%	17%
Cost Estimators	$29.82	16%	46%	38%
Roofers	$19.14	31%	51%	9%
Sales Representatives, Services, All Other	$24.84	30%	49%	21%
State Average for All Occupations	**$22.92**	**34%**	**42%**	**24%**

Almost eight in ten employers report hiring was either “very” or “somewhat” difficult over the last 12 months, though the proportion that reported “very” difficult declined from 46 to 28 percent compared to 2016.

Employers are mostly satisfied with regional education, but cost of living, competition, and a small pool of college graduates seem to contribute to hiring difficulties. About half of employers agree that their applicants have the necessary technical skills (53 percent) and local education and training programs are successful at instilling the appropriate skills in graduates (47 percent). However, employers are not satisfied with applicants’ non-technical skills, such as critical thinking or problem-solving (53 percent). Despite confidence in technical training, 47 percent of employers agree that there is a lack of college graduates in the applicant pool. When asked whether employers paid a higher wage to employees who have specific expertise, knowledge, or certification, employers stated that they pay $2 per hour more to those employees who have specific clean energy technology certification or knowledge.

Employers also note that cost of living and competition contributes to hiring difficulties; 47 percent each agreed that cost of living and competition resulted in difficulties with talent recruitment.

Clean energy research and development in the state, especially in relation to marine science, are centered at the University of Rhode Island and the Naval Station located in Newport, Rhode Island. Groundbreaking advancements in offshore wind, wave/tidal power, and algae biofuels are being made at these institutions of study. While these clean energy epicenters bode well for innovation, employers have noted disappointment in the lack of a private sector core of innovative businesses focused in these renewable and marine areas in southern Rhode Island. An increased effort to bring industry to the southern half of the state where these marine research institutions are located will be extremely important in promoting interest and economic growth in Rhode Island's clean energy future.

Figure 9. Hiring Difficulty, 2017

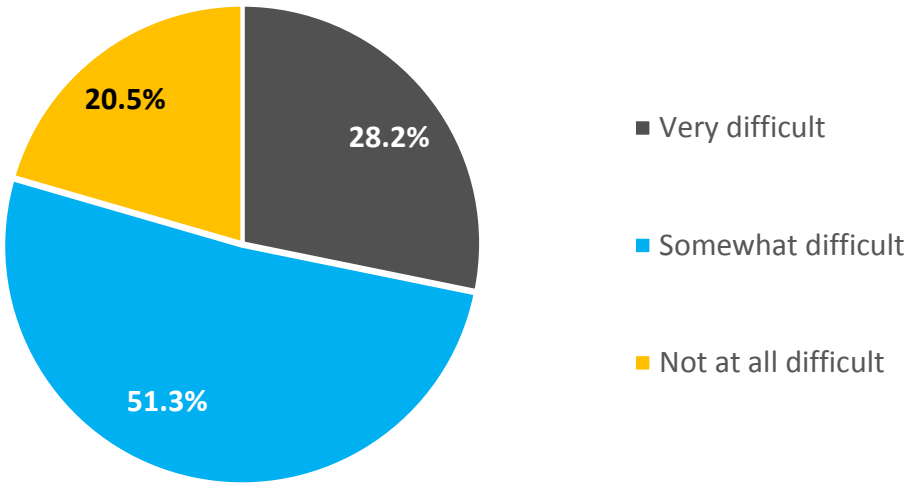
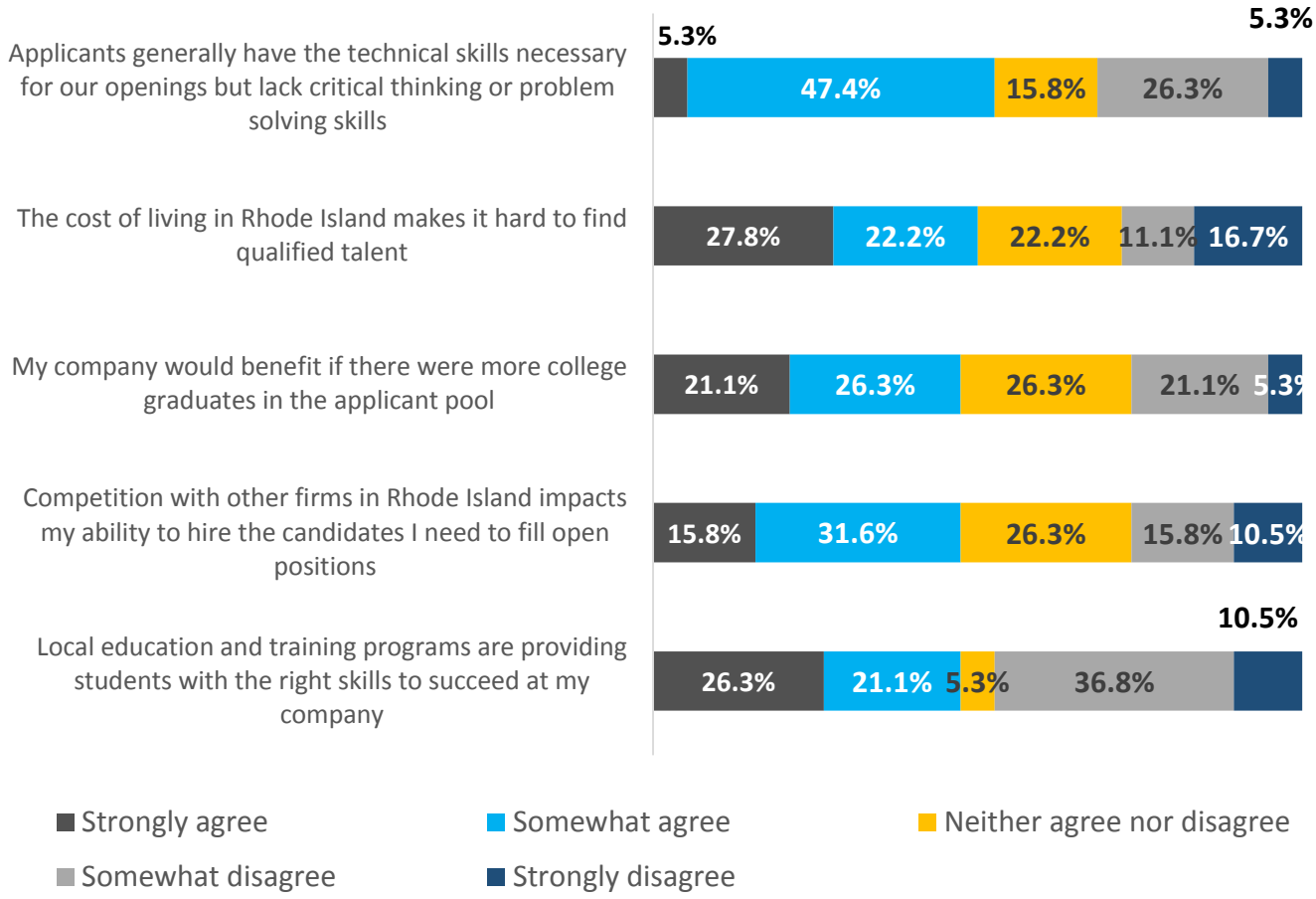
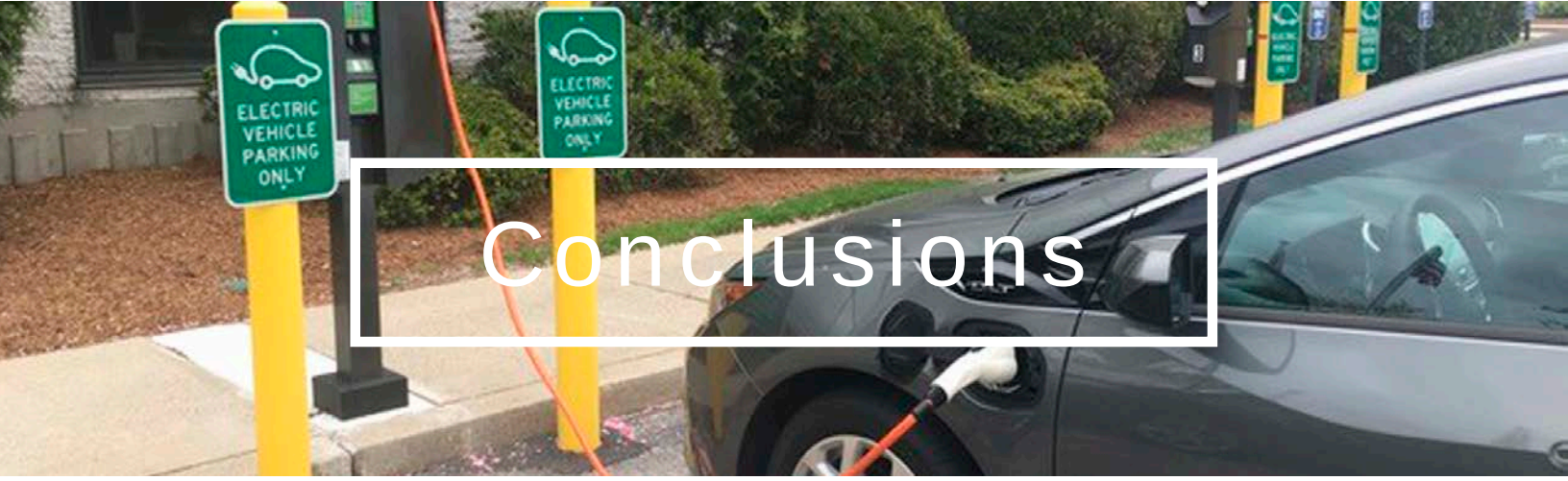


Figure 10. Hiring Considerations, 2017





Conclusions

In the third review of Rhode Island's clean energy economy, 2017 results suggest a growing market that again ranks amongst the most promising states in the nation. Based on detailed surveys completed by clean energy employers across the state, the Ocean State now supports over 15,000 clean energy jobs, a growth of 66 percent since 2014. This compares to just 20 percent clean energy employment growth in Pennsylvania since 2013.[15] The largest portion of these 15,000 clean energy workers is in energy efficiency, followed by renewable heating and cooling, renewable energy generation, and finally clean transportation. All clean energy technologies grew by at least 10 percent. This even distribution projects a balanced ecosystem across clean innovation in the state.

In terms of the renewable energy generation sector, solar and wind activities are paramount. Over the last 12 months, solar employment grew by 16 percent while wind employment grew by 10 percent. Future solar developments look to be aimed at vastly expanding small-scale, distributed installations for Rhode Island businesses and residents in order to continue the integration of clean energy into Rhode Island's power grid. Federal interest and the private success of the Block Island Wind Farm foreshadow offshore wind as becoming a significant part of Rhode Island's future energy regime. Observers should look for large wind projects to be commissioned federally with the support of interstate cooperation between Massachusetts and Rhode Island.

This year's report found that Rhode Island's value chain is dominated by installation, maintenance, and repair firms, which account for nearly half of all establishments. Installation firms grew employment by 16 percent. At the same time, trade firms reported a 32 percent employment growth, as the number of employers that reported primarily in-state suppliers increased by 11 percentage points. This year's data also shows an emerging trend towards larger clean energy establishments, with the decline in employers that report one to five clean energy workers alongside the increase in those that reported six to 24 workers. As the supply chain becomes more localized, firms are also expanding their customer base, serving more out-of-state and international clients compared to last year.

This report also highlighted employer data, displaying an insufficient labor supply to support clean energy growth in Rhode Island. Most employers stated that hiring difficulties were due to

[15] Clean Jobs Pennsylvania, Environmental Entrepreneurs (E2) and Keystone Energy Efficiency Alliance (KEEA), July 2016

the cost of living, competition, and a small applicant pool of college graduates in the state. Despite the current lack of labor supply, Rhode Island's clean energy cluster remains committed to improving labor market connectivity. Data suggest that most of Rhode Island's employers are in support of a future statewide program that provides funding for clean industry interns and additionally a free college tuition initiative for state residents.

In order to attract clean energy companies and workforce talent to the area, the state might see beneficial results from further promoting the unique nexus of marine and clean energy innovation possibility in the southern part of the state. Policy initiatives and education should be aimed at facilitating the connection between the world class marine research and development centers at the University of Rhode Island and the Newport Naval Base. Despite the state's small geographical size, the 384 miles of coastline provide ample opportunity for these institutions and clean energy companies to partner in developing and testing technology in marine environments invaluable in modeling the nation's future in offshore wind, tidal, and hydropower.

In summary, this year's data and subsequent analysis suggest that the clean energy economy of Rhode Island will see growth in an array of important economic growth indicators for 2017 and beyond. From the United States' first offshore wind farm to the ground-breaking marine research being conducted throughout the state, Rhode Island continues to champion the clean energy transition. The smallest state in the nation bolsters one of the brightest futures for clean energy and economic growth.

Appendix A: Methodology

The 2017 Rhode Island Clean Energy Jobs Report uses publicly available data on Rhode Island energy employment produced by the U.S. Department of Energy, available at: https://energy.gov/downloads/2017-us-energy-and-employment-report. These public data are refined and customized for Rhode Island based on a supplemental survey conducted on behalf of the Rhode Island Office of Energy Resources and Commerce Rhode Island by BW Research Partnership, Inc.

The supplemental survey resulted in a total of 3,472 calls, with more than 180 completions. The margin of error is +/-5.39 percent at a 95 percent level of confidence. The survey was administered between March 13, 2017 and March 27, 2017 and averaged 14 minutes in length.

For more details on the USEER methodology, please see: http: https://energy.gov/downloads/2017-us-energy-and-employment-report.

Appendix B:
Geographic Distribution of Clean Energy Jobs

County	2016 Employment	2017 Employment
Bristol County	444	638
Kent County	2,282	2,586
Newport County	1,313	1,603
Providence County	8,046	8,424
Washington County	1,690	2,054

Congressional District	2016 Employment	2017 Employment
1	8,338	8,756
2	5,438	6,549

Senate District	2016 Employment	2017 Employment
1	2,422	1,722
2	940	1,330
3	704	718
4	156	120
7	900	1,076
9	237	363
10	528	815
11	230	318
12	724	884
13	135	97
14	670	655
16	68	106
17	995	1,073
20	257	343
21	609	884
22	413	527
23	135	186
26	149	215
29	1,319	1,462

House of Representatives	2016 Employment	2017 Employment
1	2,436	1,615
2	568	815
4	372	521
6	961	989
9	413	512
10	372	515
15	149	215
19	345	435
20	853	767
21	122	260
24	589	590
25	291	421
28	74	100
29	54	92
31	548	630
33	562	615
36	440	590
38	88	166
39	54	49
40	338	404
44	704	735
45	304	392
47	47	137
48	223	192
49	257	343
56	68	106
63	494	487
64	176	169
66	142	135
67	81	195
68	223	312

30	352	226	69	230	318
32	142	135	70	338	506
34	392	630	71	81	114
35	927	990	72	250	329
37	34	54	73	399	440
38	338	375	74	129	97