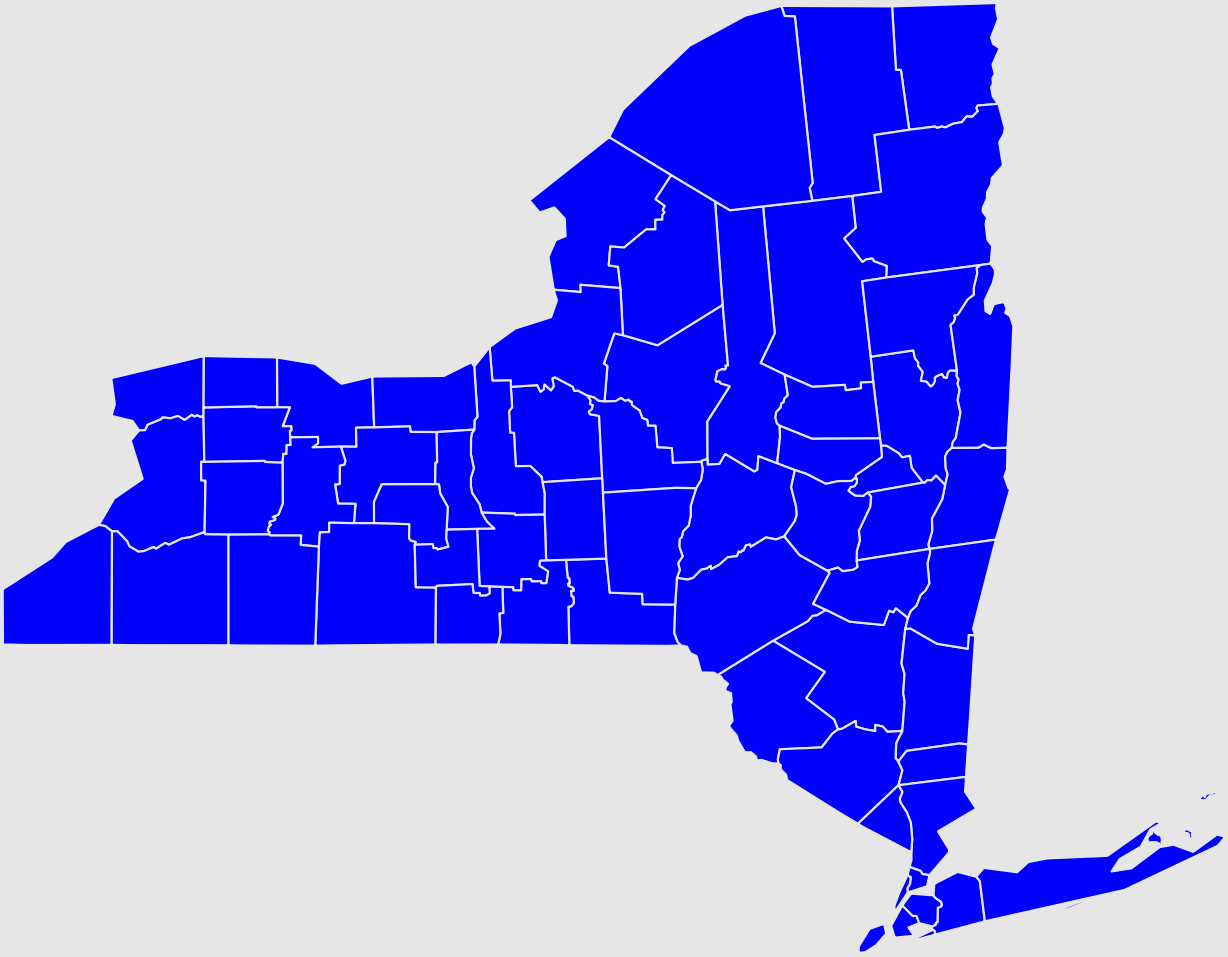
Clean Jobs New York



Presented by

Environmental Entrepreneurs (E2)
New York State Sustainable Business Council
Alliance for Clean Energy New York
New Yorkers for Clean Power

May 2016

About the Partners

Environmental Entrepreneurs (E2) is a national, nonpartisan group of business leaders, investors and others who promote smart environmental policies that drive economic growth. E2 members, active in nearly every state in the country, have built or financed more than 1,700 companies that have created more than 570,000 jobs, and manage more than $100 billion in venture and private equity capital. E2 is an affiliate of the Natural Resources Defense Council (NRDC).

New York Sustainable Business Council (NYSSBC) is an alliance of business organizations and businesses committed to advancing a vibrant, just, and sustainable economy in the state. The organization promotes strategies and policies designed to build strong local economies, prioritizes investment and innovation in clean technologies from green chemistry to renewable energy sources, and advances the development of sustainable communities in New York State.

The Alliance for Clean Energy New York (ACE NY) is an alliance of private clean energy companies and non-profit public interest organizations, dedicated to promoting clean energy, energy efficiency, a healthy environment, and a strong economy for the Empire State. Our members include companies focusing on wind energy, solar power, and hydropower, fuel cells, biogas, and biomass. ACE NY is New York's premier advocate for the rapid adoption of clean energy alternatives and energy conservation. We are an active participant in public education and outreach efforts, legislative and regulatory affairs, and the oversight of electricity markets.

New Yorkers for Clean Power is a statewide campaign to rapidly shift to a clean energy economy. Through education, advocacy and organizing, the campaign engages the public, local governments and businesses to advance a range of renewable energy, efficiency and clean transportation solutions.

About the Research and Analysis Partners

BW Research Partnership is a full-service, economic and workforce research consulting firm with offices in Carlsbad, California, and Wrentham, Massachusetts. It is the nation's leading provider of accurate, comprehensive clean energy research studies, including the National Solar Census, wind industry analyses for the National Renewable Energy Laboratory and the Natural Resources Defense Council, and state-level clean energy reports for Massachusetts, Illinois, Vermont, Iowa, and Florida, among others.

The Economic Advancement Research Institute (EARI) is a nonprofit research organization focused on economic mobility and regional competitiveness. EARI is primarily focused on studying the impact of policies and systems on economic growth and prosperity across all income levels. EARI has conducted numerous labor market analyses that address key economic sectors with high probability to provide opportunities to underrepresented and disadvantaged populations.

Acknowledgements

E2, New York Sustainable Business Council, Alliance for Clean Energy New York and New Yorkers for Clean Power would like to thank all the firms that provided information on their clean energy and transportation activities in response to the Clean Jobs New York survey. Researchers could not have gathered this data without respondents' willingness to share their valuable time and insights. We also would like to thank: Black Oak Wind Farm, Taitem Engineering, and AWS Trupower for their time and contributions to the company profiles featured in this report.

The publication of this report would not have been possible without the hard work and dedication of the following individuals:

Philip Jordan *BW Research Partnership*

Lauren Kubiak *NRDC*

Jeff Benzak *E2*

Bob Keefe *E2*

Peter Voskamp *for E2*

Anne Reynolds *ACE NY*

Laura Ornstein *NYSSBC*

Kate Sinding

Tom Roush

Donna Wong Blackburn

Introduction

In an effort to better understand how clean energy is creating jobs and what policies are needed now to support further gains in the future, Clean Jobs New York looks at the size and scope of the state's clean energy economy.

Overall Clean Energy Jobs

Relying on databases and survey data from New York employers, the results of this comprehensive report are impressive: In New York, clean energy employs more than 85,000 workers at more than 7,500 business establishments.

These are scientists and researchers who make solar panels cheaper and more efficient. They're factory workers who manufacture energy-efficient appliances, wind turbine blades, and solar components. And they're engineers, construction workers, and administrative staff who develop and install clean energy products and services.

Clean energy businesses anticipate growing more than 6 percent this year. That's more than double the growth rate of the entire U.S. economy in 2015. To meet this growth rate and ultimately surpass it, stronger policies are needed, right now, to ensure clean energy becomes an increasingly important part of New York's job market.

Defined as including energy efficiency, renewable energy sources, alternative transportation and greenhouse gas (GHG) management and accounting, the clean energy industry is a source of good jobs for tens of thousands of New Yorkers.

In 2015, New York's clean energy industry supported 85,197 workers at 7,500 establishments. Companies in the state are bullish on the industry's future, and project hiring at a 6 percent growth rate through 2016.

The state's growth in clean energy jobs is due in no small part to New York's long and continuing tradition of supporting strong clean energy policies. And recently, under Governor Andrew Cuomo, New York has demonstrated national leadership on a wide range of climate and clean energy issues.

Quick Facts

85,197
clean energy workers in New York

6%
anticipated growth in clean energy jobs

Clean energy technologies

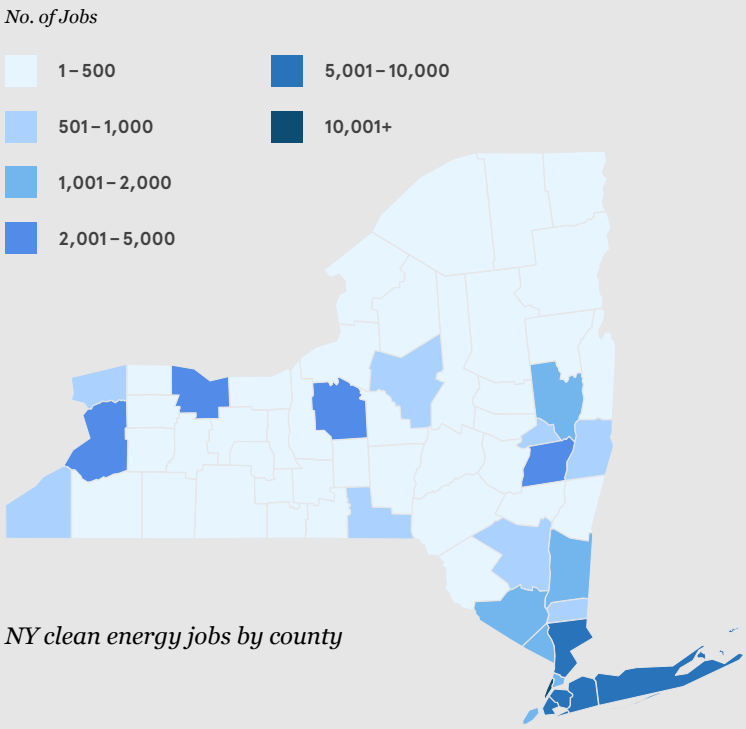
Clean Energy Jobs In Every County

Metropolitan New York City leads the state in clean energy jobs, with 57,433 residents working in clean energy, but every county in the state is home to some clean energy workers.

The Albany-Schenectady-Troy metro area is the No. 2 metro area for clean energy jobs, employing nearly 5,000 residents. In the Buffalo-Niagara Falls area, there are more than 4,000 clean energy workers, while rural and non-metropolitan areas are home to nearly 5,400 clean energy workers.

Among counties, New York County (Manhattan) leads the state with nearly 19,000 clean energy workers. Nearly 8,600 workers call Suffolk County home, while just under 5,700 live and work in Westchester County.

Clean energy jobs can also be found in every congressional district in the state and almost every legislative district.



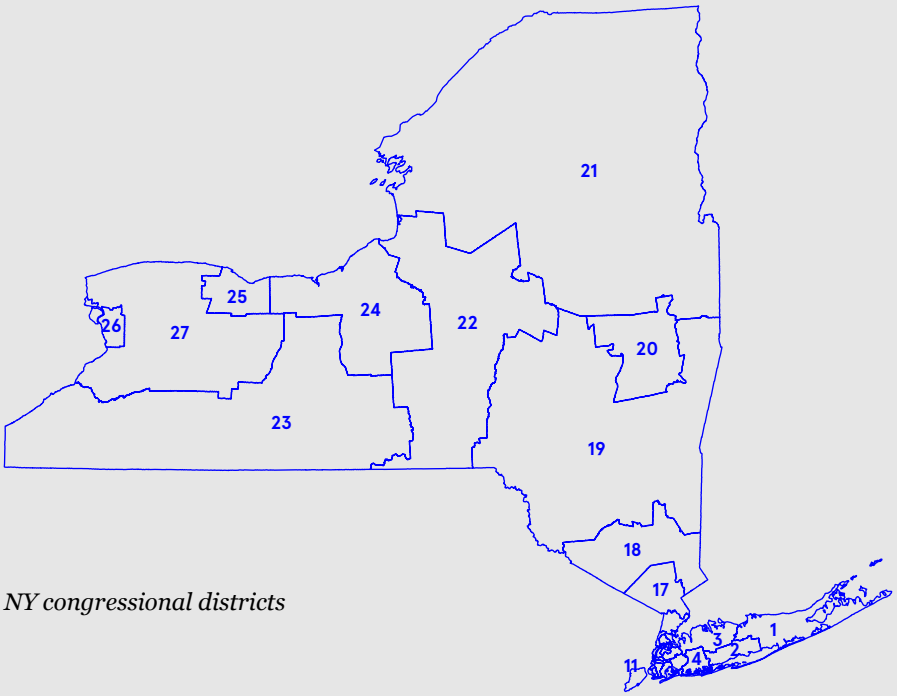
NY clean energy jobs by county

County	*Employment*
Albany	2,498
Allegany	102
Bronx	1,860
Broome	756
Cattaraugus	250
Cayuga	253
Chautauqua	529
Chemung	273
Chenango	174
Clinton	319
Columbia	352
Cortland	148
Delaware	240
Dutchess	1,249
Erie	3,395
Essex	181
Franklin	161
Fulton	237
Genesee	197
Greene	161
Hamilton	33
Herkimer	135
Jefferson	352
Kings	5,303
Lewis	82
Livingston	177
Madison	220
Monroe	3,037
Montgomery	135
Nassau	8,243
New York	18,869
Niagara	661
Oneida	746
Onondaga	2,225
Ontario	437
Orange	1,502
Orleans	69
Oswego	345
Otsego	210
Putnam	594
Queens	5,236
Rensselaer	619
Richmond	1,421
Rockland	1,666
Saratoga	1,062
Schenectady	650
Schoharie	172
Schuyler	59
Seneca	99
St. Lawrence	253
Steuben	256
Suffolk	8,555
Sullivan	365
Tioga	135
Tompkins	391
Ulster	861
Warren	322
Washington	164
Wayne	299
Westchester	5,690
Wyoming	108
Yates	105

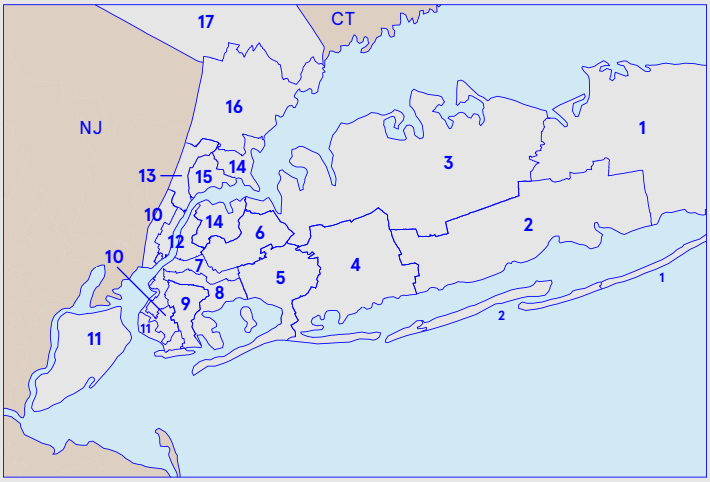
NY clean energy jobs by county

Clean Energy Jobs In Every Congressional District

Clean energy knows no politics. Clean energy jobs are growing in legislative and congressional districts across the state. With the right policies from Albany and Washington, D.C., even more jobs can be created all across the state.



NY congressional districts



New York Metropolitan area—congressional districts

Congressional District	*Employment*
1	5,613
2	2,994
3	5,104
4	4,002
5	1,261
6	2,085
7	5,484
8	1,208
9	590
10	7,843
11	1,616
12	8,691
13	707
14	1,220
15	711
16	2,413
17	4,831
18	3,241
19	3,382
20	4,333
21	2,302
22	2,389
23	2,718
24	3,077
25	2,792
26	3,050
27	1,540

NY clean energy jobs by congressional district

Clean Energy Jobs In Every Legislative District

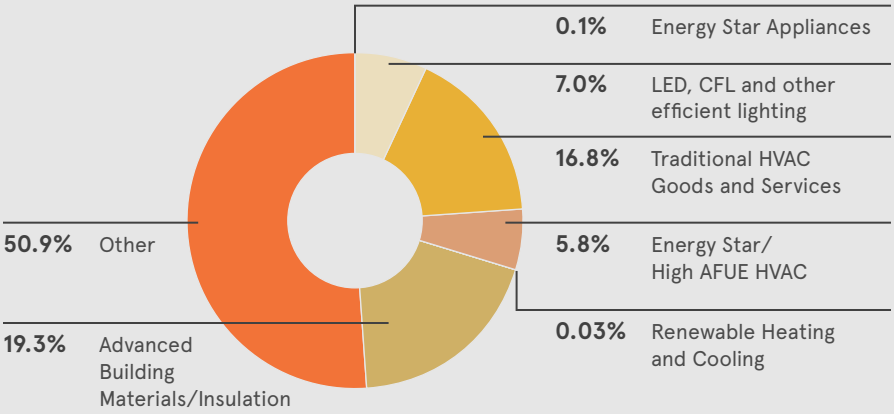
Upper House District	*Employment*	*Upper House District*	*Employment*
1	2,511	33	149
2	3,371	34	734
3	1,922	35	2,802
4	653	36	169
5	2,096	37	1,575
6	3,313	38	1,721
7	1,588	39	1,446
8	875	40	1,524
9	727	41	1,181
10	1,000	42	1,416
11	1,395	43	2,082
12	1,778	44	2,652
13	568	45	1,131
14	278	46	944
15	198	47	1,255
16	109	48	562
17	2,205	49	479
18	1,133	50	2,433
19	286	51	1,161
20	693	52	947
22	250	53	197
23	863	54	1,225
24	609	55	1,235
25	568	56	1,466
26	4,879	57	1,155
27	11,445	58	639
28	863	59	1,643
29	818	60	1,329
30	464	61	700
31	335	62	710
32	621	63	120

NY clean energy jobs by Upper House district

Lower House District	*Employment*	*Lower House District*	*Employment*	*Lower House District*	*Employment*	*Lower House District*	*Employment*
1	1,471	38	40	82	137	122	883
2	641	41	991	84	218	123	127
3	795	42	270	85	77	124	465
4	590	43	214	88	1,696	125	515
5	793	44	512	89	612	126	582
6	806	45	371	90	165	127	716
7	625	46	250	91	1,018	128	974
8	653	49	210	92	1,201	129	60
9	1,205	50	709	93	882	130	692
10	1,576	51	278	94	693	131	816
11	137	52	645	95	242	132	385
12	36	53	193	97	185	133	689
13	2,128	54	230	98	786	134	673
14	822	55	73	99	683	135	144
15	298	58	206	100	412	136	425
16	1,636	60	8	101	1,007	137	683
17	149	61	838	102	736	138	23
18	1,310	62	604	103	746	139	325
19	222	63	4	104	435	140	549
20	727	65	4,567	105	435	141	1,107
21	351	66	749	106	284	142	475
22	85	67	2,518	107	796	143	743
23	411	68	351	108	1,455	144	304
24	641	69	12	109	837	145	368
25	580	70	105	110	651	146	164
26	326	71	185	111	248	147	375
27	826	72	60	112	1,011	148	331
28	383	73	6,242	113	325	149	70
29	391	74	564	114	505	150	509
30	1,217	75	2,875	115	495		
31	20	76	24	116	468		
33	48	77	455	117	388		
34	181	78	492	118	197		
35	12	79	89	119	60		
36	238	80	214	120	435		
37	8	81	153	121	368		

NY clean energy jobs by Lower House district

Energy Efficiency Jobs



Energy efficiency subtechnologies

Energy efficiency employs more than 69,000 New Yorkers — or approximately 80 percent of the state's total clean energy workforce. These workers improve the efficiency of commercial and residential facilities, manufacture Energy Star appliances, and develop advanced energy-saving materials.

Most efficiency workers fall into the "Other" category, likely because they work with multiple technologies.

While New York's energy efficiency industry is strong, there are warning signs it's losing ground. For example, the American Council for an Energy Efficient Economy (ACEEE) in 2013 ranked New York third nationwide for leadership in energy efficiency. By 2014, however, New York had fallen to seventh, then it dropped further to ninth in 2015.

For an example of how to strengthen its energy efficiency economy, New York can turn to neighboring Massachusetts. With one-third New York's population, Massachusetts has a comparable number of energy efficiency workers. Massachusetts has achieved this by consistently setting higher statewide energy savings targets and investing five times more than New York in its energy efficiency economy.

To reap the cost savings, increased job growth, and other benefits that come with a more energy-efficient economy, New York should establish clear and robust statewide energy efficiency targets even as the means of delivering these EE programs continues to evolve under the Reforming the Energy Vison (REV) initiative. As other leading states have demonstrated, a 2% annual savings level relative to electricity sales is achievable and delivers net benefits to consumers — and some states are approaching 3% levels.

Quick Facts

82%

of New York's total clean jobs workforce is employed in energy efficiency

Taitem Engineering *Case Study*

What's in a name?

When it comes to Taitem Engineering, quite a lot. In fact, its entire business philosophy is encompassed in the acronym: Technology As If The Earth Mattered.

Taitem Engineering workers help install a solar array. Based in Ithaca, Taitem now has more than 45 employees. (Photo courtesy of Taitem)

NOW BASED IN ITHACA, Taitem began in Syracuse in 1989 primarily as a consulting engineering business concentrating on sustainable design. Founder and chairman Ian Shapiro started the company out of his house.

In the last 25 years, Taitem has expanded beyond mechanical, electrical, plumbing, and structural design. It now offers energy-related services including energy audits, energy modeling, LEED consulting, and commissioning. In the last five years, the company branched out to offer contracting services for solar photovoltaic installation and Aeroseal duct sealing, resulting in rapid growth.

Shapiro literally wrote the book on topics like these, co-authoring Green Building Illustrated and, more recently, Energy Audits and Improvements for Commercial Buildings, due to hit the shelves in April 2016, for which he is the sole author.

The company has over 45 employees, including nine licensed professional engineers, and it continues to grow, said Taitem's Marketing Manager, Theresa Ryan.

The company's contracting work ranges from a 46-kilowatt solar array at the Ulysses Philomathic Library in Trumansburg, New York, to sealing ducts in commercial and multifamily buildings in New York City.

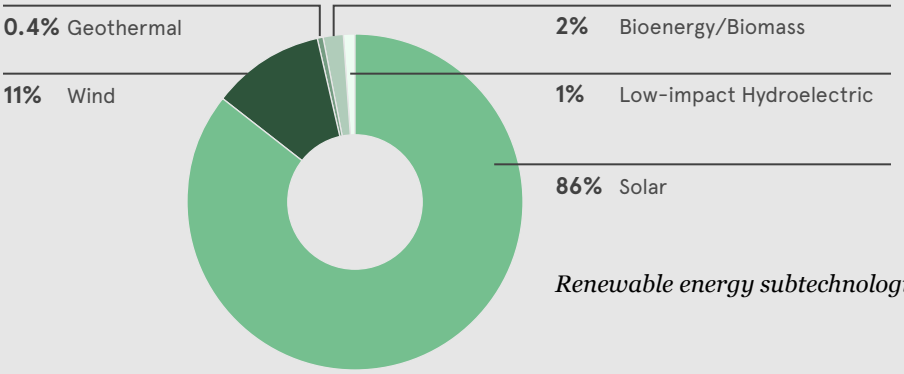
Taitem is pursuing the expanding duct sealing market. Taitem's team of consultants and trained technicians evaluate ventilation systems to determine issues and possible solutions, which include Aeroseal duct sealing. When duct leakage is identified, Taitem seals air leaks up to 5/8 inches in diameter from the inside using a polymer sealant. Duct sealing results in energy savings, improved building performance, and improved indoor air quality.

For example, Cornell University wanted to install new ventilation controls in its century-old Baker Laboratory. But Cornell found that the ductwork was honeycombed with leaks. Taitem's efforts to seal the ductwork resulted in an 89-percent reduction in duct leakage. This, along with other improvements to the system, will save the institution a projected $200,000 annually.

Taitem also reduced leakage in a new 34-story, multi-family building in Manhattan. Even after the contractors' high-quality workmanship, the 389-apartment building was still losing 14 percent of air flow through its ducts. After Taitem treated the building, leakage was reduced to less than 1 percent, saving an estimated $7,300 annually and leading to a project payback of less than seven years.

Taitem's employees work on a range of clean energy technologies — including renewable energy and energy efficiency. (Photo courtesy of Taitem)

Renewable Energy Jobs



Renewable energy subtechnologies

Renewable energy generation employs more than 12,400 New Yorkers, or about 15 percent of the state's clean energy workforce. More than 10,600 of these jobs are in solar generation, with the remaining workers employed in wind, geothermal, biofuels, and low-impact hydroelectric power.

Quick Facts

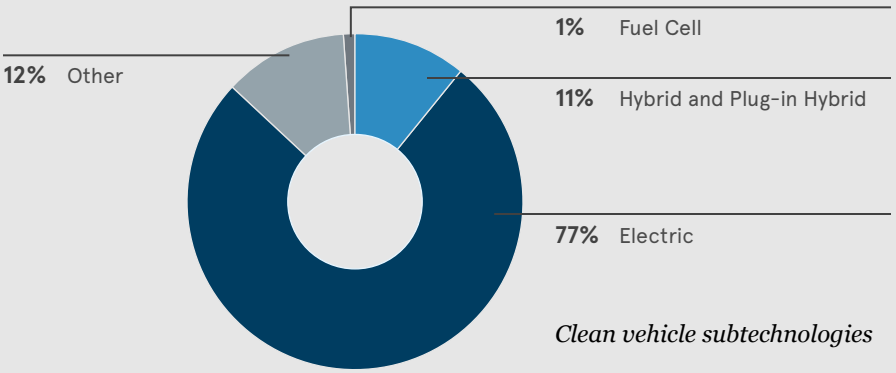
15%

of the clean jobs workforce in renewable energy jobs

Transmission Jobs

Clean transmission, which includes smart grid and storage, accounts for 2,382 of the state's clean energy workers. The majority of workers (1,833 employees) work with storage technologies; about 600 workers support smart grid technologies.

Clean Vehicles Jobs



Clean vehicle subtechnologies

Representing about 1 percent of the state's clean energy industry, clean vehicles employ 650 workers; the largest category of employment is electric vehicles (77 percent).

AWS Truepower *Case Study*

Albany-based consulting firm employs 120 people in NY, elsewhere

AWS helps renewable energy developers find right spot for right project

IN THE 1970S, upstate New York native Bruce Bailey watched as global energy prices fluctuated wildly due to the OPEC oil embargo. Simultaneously, the public was growing concerned about air pollution. Because of these market forces, Bailey recognized renewable energy would eventually become a big part of New York's economy. "Renewables just made too much sense," he said.

But New York's transition to renewables took longer than Bailey expected. When the burgeoning U.S. wind industry first took hold in California, Bailey contemplated moving there. However, Bailey stayed true to his Empire State roots, and in the early 1980s he founded a company offering companies meteorological advice based on SUNY Albany research. In those early days, most clients were wind and solar demonstration projects in New York State.

> **"Renewables just made too much sense."** *– Bruce Bailey*

Now, nearly four decades later, Albany-based AWS Truepower — the company that grew out of that first business effort — is a state-of-the-art renewable energy consultancy with 120 employees who advise on wind and solar projects worldwide. In addition to its Albany office, the company has branches in Mexico, Canada, Spain, India, Brazil, and San Diego. The bulk of AWS Truepower's workforce — about 70 people — is based in Albany, in part because most of the company's business remains in North America.

In the U.S., AWS Truepower helps investors and developers identify where renewable energy projects should be sited based on factors like wind and sun resources. This ensures the best spot is selected before shovels dig into the ground. AWS Truepower workers also act as third-party consultants during construction; monitor post-construction performance; and even develop software to assist in these efforts.

Since 2014, AWS Truepower has been involved in half of all major U.S. wind energy projects, including the 845-megawatt Shepherd's Flat wind farm in Oregon. For more than a decade, AWS has also consulted on what will be the nation's largest wind farm, currently under construction in Wyoming. The farm will have 1,000 turbines totaling more than 2 gigawatts of capacity — three times Shepherd's Flat's.

For projects like Shepherd's Flats, AWS analyzed on-site and regional wind data and simulated the layouts of wind turbines. This predicted the project's energy production over a 20-year timeframe.

"Our analysis is reviewed by banks that are making lending decisions on the order of hundreds of millions of dollars," Bailey said.

With clean energy a growing part of America's energy mix, states have hired AWS to be the primary forecaster for predicting how much energy a given state's renewable energy portfolio can generate at any one time. This helps utilities and grid operators adjust electricity delivery schedules, ensuring we can all keep the lights on.

For example, AWS forecasts the electricity output of every major utility-scale wind farm (generally at least 50 megawatts of capacity), along with some solar installations, in Texas, California, Nevada, New York and Hawaii. Add in projects in New Brunswick and Saskatchewan in Canada, and AWS forecasts more than 40,000 megawatts of total renewable energy capacity.

AWS has also been part of the burgeoning U.S. offshore wind industry. It assisted the Cape Wind project and conducted pre-development meteorology for Deepwater Wind's Block Island project in Rhode Island, the nation's first offshore wind farm.

Have low fossil fuel prices slowed growth in renewables? "Not at all," said Bailey. The cost of solar and wind has dropped nearly 60 percent in recent years, with wind in particular becoming competitive with established sources without subsidy, he said. In Texas, for example, wind power might go for as low as 2 cents per kilowatt-hour.

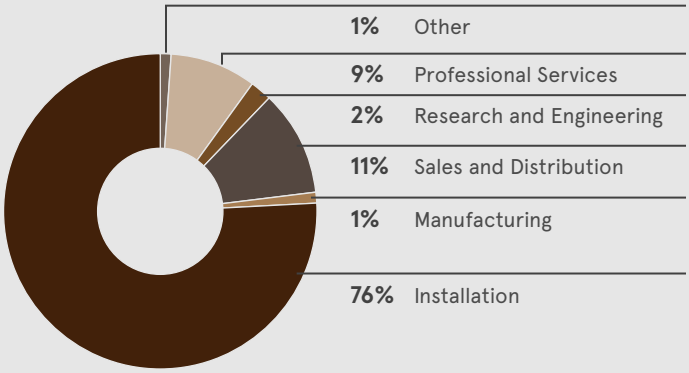
With the pending retirement of coal plants, along with increased confidence in the reliability and predictability of clean energy sources, Bailey said smart policies help grow the sector.

"Policy makers are moving aggressively with renewables," he said. "The pursuit is a universal phenomenon."

Three of the 120 workers at Albany-based AWS Truepower, a renewable energy consultancy that advises on wind and solar projects worldwide. (Photo courtesy of AWS Truepower)

Value-Chain Activity

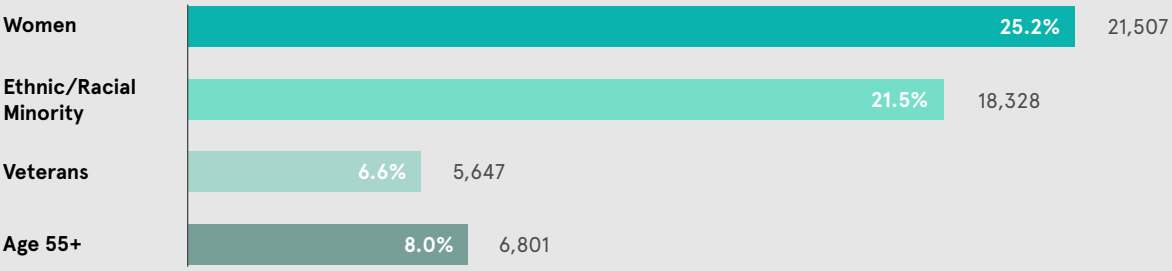
Value Chain	*Employment*	*% of Total Employment*
Installation	64,361	76%
Manufacturing	1,064	1%
Sales and Distribution	9,175	11%
Research and Engineering	1,795	2%
Professional Services	8,077	9%
Other	725	1%
Total	**85,197**	



Value-chain breakdown

New York has a remarkably large clean energy installation sector, with 76 percent of total employment. Sales and distribution comprise 11 percent of clean energy employees, while professional services employ 9 percent of the workforce. The remaining sectors each represent under 3 percent of employment.

Other Key Findings



Demographics for current clean energy workforce

New York companies express concern about filling jobs in the future. Already, 81 percent of businesses say that it is "difficult" or "very difficult" to find qualified applicants for available positions. The two most reported reasons businesses have difficulty filling positions include: 1) lack of experience, training, or technical skills; and 2) insufficient qualifications or certification. Firms report the most difficulty hiring managers, directors, and supervisors, as well as installation and engineering positions. Nonetheless, hiring in 2015 was strong overall.

Out-of-state consumers and businesses are the largest group of customers for New York's clean energy industry. Fifty-two percent of New York companies service out-of-state customers, and 6 percent reported international clients.

About a quarter of workers in New York's clean energy industry are women. More than a fifth are racial or ethnic minorities, while 6.6 percent are veterans and 8 percent are more than 55 years old.

Quick Facts

81%
of businesses say it is difficult to find qualified applicants for available positions

52%
of companies service out-of-state customers

Policies Matter

RGGI

New York is a pioneer in leveraging commonsense policies to drive deployment of renewable energy and energy efficiency. For example, about a decade ago former Governor George Pataki led a bipartisan group of governors to design our nation's first cap-and-trade program to cut power sector carbon pollution. The program was recently strengthened under the leadership of Governor Cuomo. This collaboration between New York and eight other Northeastern and Mid-Atlantic states—called the Regional Greenhouse Gas Initiative, or RGGI—has cut dangerous carbon pollution while lowering utility bills, strengthening the grid, and growing the economy.

In the seven years RGGI has been in place, participating states cut power-plant carbon pollution by more than 37 percent, while saving an estimated $10 billion in public health costs. The program has also created more than 30,000 job-years of work (one job-year is equivalent to one year of full-time employment); led to more than $390 million in energy bill savings; and generated $2.9 billion in regional economic activity.

In New York alone, RGGI has spurred $1.1 billion in health cost savings, according to an Acadia Center analysis of EPA data, and $89 million in consumer energy bill savings, according to the most recent data from the New York State Energy Research and Development Authority (NYSERDA).

Visonary Standards

Alongside RGGI, Governor Cuomo's Reforming the Energy Vision, or REV, will make New York's electricity system cleaner, more resilient, and more affordable.

One of REV's pillars is New York's Clean Energy Standard, which Governor Cuomo outlined in late 2015. More details of the standard are expected to be announced in June, but it will require New York to source half its electricity from renewable energy like solar and on-and off-shore wind by 2030.

In early April, New York's Public Service Commission released a report showing that hitting the 50-percent renewables target would create economic benefits totaling $1.8 billion by 2023.

The new Clean Energy Standard will build on the success of New York's previous standard, the Renewable Portfolio Standard (RPS), which required 30 percent of New York's electricity needs to be met with renewable resources by 2015 and has been central to development of virtually all Empire State clean energy projects. The RPS expired at the end of 2015, and thus finalization of the new Clean Energy Standard is essential to continuing investment in renewable energy in New York.

Quick Facts

$10B
savings in public health costs

$390M
in energy bill savings

$2.9B
generated in regional economic activity

Clean Energy Standard will require New York to source half its electricity from renewable energy by 2030

$1.8B
estimated economic benefits by 2023 if 50% renewables target is hit

The renewables standard relied on NYSERDA to act as a central procurement agency to manage programs promoting renewable energy development. NYSERDA drove deployment of than 2,000 megawatts of renewable energy while spurring more than $2.7 billion in direct investment in New York's economy. All told, the RPS produced about $3 of investment for every $1 of public support. That return-on-investment can be seen in places like Buffalo, where a new SolarCity manufacturing facility is already employing 450 people and will likely hire another 1,000 workers by 2017.

RPS produced $3 of investment for every $1 of public support

In addition, the state's $5 billion Clean Energy Fund will invest in programs to facilitate deployment of energy efficiency and innovative clean technologies, including NY Sun and the NY Green Bank. Working over the next decade in concert with the CES and new market mechanisms created through REV, these programs will help achieve the ambitious goals set forth in New York's State Energy Plan.

Businesses Respond to Policies

Clean energy business owners in New York recognize that supportive policies and programs could generate more customers, increase revenue, and support additional job creation. Specifically, three-quarters mentioned the Renewable Energy Investment Tax Credit (REITC), unaided, when questioned about specific policies that have contributed to firm success; 53 percent mentioned the state-level Renewable Portfolio Standard (RPS)/ Energy Efficiency Portfolio Standard (EEPS). Nearly one in 10 firms mentioned red tape regulations (10 percent) to be significant barriers to success. With an aided question, nearly all (94 percent) firms are aware of the REITC, 53 percent are aware of the federal Clean Power Plan, and 75 percent are familiar with the state-level RPS/EEPS. The majority feel the REITC (71 percent) and RPS/EEPS (71 percent) have increased business prospects; 73 percent expect the Clean Power Plan to increase business prospects.

High levels of recognition and awareness of policies and programs among clean energy business owners in New York

73%
expect Clean Power Plan to increase business prospects

71%
feel that REITC & RPS/EEPS have increased business prospects

Conclusion

New York's clean energy economy is based on a strong foundation and is primed for continued growth. In order for these jobs to come to fruition and for the state to reap the benefits that come with a clean energy economy, Governor Cuomo and NYSERDA must show continued leadership by finalizing and implementing a robust Clean Energy Standard, further strengthening RGGI post-2020, leveraging the Clean Energy Fund, and doubling down on energy efficiency by establishing clear, ambitious, binding targets. Doing so would create thousands more clean energy jobs.

Black Oak Wind Farm *Case Study*

Ithaca-area farm home to wind farm owned by community

Project creates jobs in construction, other areas.

ALMOST A DECADE AGO, farmer Marguerite Wells agreed to help a neighbor pursue an idea: a community-owned-and-operated wind farm. This suggestion soon took on a life of its own, turning into a multi-year, multi-million-dollar project.

It's taken a decade to complete, but next fall seven General Electric turbines will begin generating clean, renewable electricity near Enfield, New York, about 10 miles west of Ithaca. Each turbine will have a generating capacity of 2.3 megawatts, bringing Black Oak Wind Farm's total capacity to 16 megawatts — enough to power 5,000 homes.

The farm has been developed by the surrounding community — the 150 households within 25 miles of the project who invested in it. Others who live close to the wind farm will share in its revenue as part of a "Good Neighbor" agreement.

Black Oak is the first commercial-sized, community-developed wind farm in New York State.

Wells, Black Oak's vice president and project manager, raised the money, negotiated leases with a half-dozen small landowners, purchased the turbines and jumped through the many regulatory and local government hoops.

The project has already created jobs, with more on the way. Electricians will install power lines and construct substations. Contractors have been hired to build and grade new roads, as well as repair existing ones. Workers will be busy pouring concrete pads where the turbines will be sited. And steelworkers, crane operators and GE crews will soon join the project to install the large turbines.

Once Black Oak's turbines are commissioned and delivering energy, additional workers will be needed to monitor operations remotely.

Each turbine will have a generating capacity of 2.3 megawatts, bringing Black Oak Wind Farm's total capacity to 16 megawatts — enough to power 5,000 homes.

The site of Black Oak Wind Farm near Enfield will allow for enough generating capacity to power about 5,000 homes. (Photo courtesy of Black Oak Wind Farm)

But the economic benefits extend beyond the jobs created. Landowners will also receive income via lease payments; cattle will continue to graze amid the turbine towers' small footprints; and the Town of Enfield and the local school district will earn more tax revenue thanks to increased business activity.

Another added benefit: because the turbines require Internet connection, Black Oak had to contract for the installation of high-speed wireless service in the rural area that was not previously served by local providers. With the farm's new connection, there are now two companies offering high-speed Internet service to residents who did not previously have access to it.

Although the project is not finalized, Black Oak's electricity — which will feed into the New York State Electric and Gas Corp. (NYSEG) grid — already has a customer: Cornell University. Cornell has agreed to purchase all the power generated by the wind farm for the next decade.

And New York State Energy Research and Development Authority (NYSERDA), impressed by Black Oak's grassroots origin and hopeful other communities will follow, will buy all of the farm's renewable energy credits for the next 10 years.

About the BW Research Energy Employment Index

The BW Research Energy Employment Index (the "Index") methodology relies on the most recently available data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW, Quarter 2), together with a detailed survey of business establishments across the United States. Taken together, the data provide the most comprehensive calculation of energy-related employment available. The methodology has been used for local, state, and federal energy related data collection and analysis for nearly a decade, including The Solar Foundation's National Solar Jobs Census series, Clean Jobs Midwest, Clean Jobs America, clean energy reports for state agencies in the Commonwealth of Massachusetts, State of Vermont, and State of Rhode Island, and numerous nonprofit agencies across the U.S.

The Index survey uses a stratified sampling plan that is representative by industry code (NAICS or ANAICS), establishment size, and geography. These data are then analyzed and applied to existing public data published by the Bureau of Labor Statistics, effectively constraining the potential universe of energy establishments and employment. BW Research Partnership believes that the methodology used for the Index could be adopted as a supplemental series to the QCEW with only minor revision.

The Index survey was administered by telephone and by web. The Index had more than 300,000 outbound calls and more than 50,000 emails. New York had a total of 461 long and short completes. The phone survey was conducted by I/H/R Research Group and Castelton Polling Institute. 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, referred to as 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.

The unknown universe includes 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 Bureau of Labor Statistics QCEW) were carefully analyzed by state to develop representative clusters for sampling. In total, approximately 20,000 business establishments participated in the survey effort, with more than 8,500 providing full responses to the survey. These responses were used to develop incidence rates among industries (by state) as well as to apportion employment across various industry categories in ways currently not provided by state and federal labor market information agencies.

For several industries, particularly transportation of goods, the Index utilized the methodology developed by the Department of Energy and the National Renewable Energy Laboratory for the Quadrennial Energy Review (QER). This methodology applies commodity flow data at the state level to employment within each transportation segment, including rail, air, truck, and water transport.

Of important note, the Index expressly excludes any employment in retail trade NAICS codes. This excludes gasoline stations, fuel dealers, appliance and hardware stores and other retail establishments.

All data in the index rely on the Bureau of Labor Statistics Quarterly Census of Employment and Wages data for the second quarter of 2015. The survey was administered between September 15, 2015 and November 24, 2015 and averaged 14 minutes in length.


NYS
Sustainable
Business
Council


ACE NY
ALLIANCE FOR CLEAN ENERGY NEW YORK, INC.
Promoting Clean Energy, A Healthy Environment
And A Strong Economy For The Empire State.


NEW YORKERS
FOR
CLEAN POWER