September
2021

Connecticut Clean Energy Industry Report

energize CONNECTICUT℠

[bw] RESEARCH PARTNERSHIP

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Drone photo of solar installation at Samuel Staples Elementary School in Easton, CT.

A Message from the Joint Committee

Although the clean energy industry is still dealing with the ramifications of the COVID-19 pandemic and the economic recession it created, the industry is positioned for growth.

The impact of the pandemic was significant, but recovery is ongoing and Connecticut has held its spot at the forefront of the industry. With the majority of COVID-19 related job losses incurred in March through May 2020, the industry in Connecticut had steady, modest growth from June through December. Despite COVID-19, clean energy contributions to statewide Gross Regional Product (GRP) increased by two percent between 2019 and 2020, an overall increase of 14 percent since 2017. These GRP contributions totaled nearly $6.64 billion, almost three percent of the state's GRP. Findings in this report and projections for 2021 also indicate that Connecticut's clean energy economy is a leader nationwide and will continue to be a significant source of jobs moving forward.

The administration of Governor Ned Lamont, the Connecticut Green Bank, the Energy Efficiency Board, the utilities who administer the energy efficiency funds, and other local, state, and federal authorities worked closely with clean energy developers and contractors to lessen the impacts of the pandemic on vital clean energy industry. This report highlights the fact that Connecticut's clean energy economy was more resilient than other states in the region and the nation overall. Total clean energy employment in Connecticut declined by only six percent in 2020 to 41,488 jobs; compared to a nationwide energy employment decrease of nine percent and neighboring state declines ranging from seven to 16 percent. The resilience of the state's clean energy industry is a testament to the resolve of the firms, workers, policymakers and others who provide leadership and support.

Brenda Watson, Chair

Eric Brown, Past Chair

Though finding qualified workers continued to be an obstacle for firms in 2020, with fewer firms hiring, and more firms indicating difficulty hiring, there remains optimism in the industry. The alternative transportation sector grew in 2020 by almost seven percent. The clean energy workforce also became more diverse in 2020, as the proportion of Hispanic/Latinx and Black/African American workers grew. Overall, firms are projecting job growth of 8 percent by the end of 2021, which set a new high-water mark for the state's industry.

Enabled by EnergizeCT and the members of the Joint Committee (Avangrid, Connecticut Green Bank, the Department of Energy and Environmental Protection, and Eversource), the positive impact of the clean energy industry in our communities should not be understated. In 2020, clean energy firms and their workers were able to create energy savings equivalent to a 122 MW power plant with 186,000 tons of CO2 emissions avoided, which is $5.2 million in public health costs saved. They created $72 million in Connecticut tax revenues. They helped nearly 70,000 households and businesses implement money and energy-saving measures that helps ease the burden of energy costs. This number includes more than 25,000 participants in the Home Energy Solutions – Income Eligible program and 170 small business projects in distressed communities.

With continued support from state leaders and new policies coming into place, including a transition from net metering to a tariff-based compensation structure for behind the meter renewable energy systems, and a new battery storage incentive program for residential, commercial, and industrial end-use customers to launch in 2022, we are committed to fostering a strong, resilient clean energy industry in our state.

These stats are from the 2020 Annual Legislative Report of the Energy Efficiency Board.

2021 Connecticut Clean Energy Industry Report

This report is the second annual report tracking clean energy employment in Connecticut. The 2020 Connecticut Clean Energy Industry Report[1] provided an important baseline from which to measure clean energy activity in Connecticut's labor market. This year's report follows in the aftermath of the global Coronavirus (COVID-19) pandemic and provides detail on how the pandemic-induced economic recession affected clean energy jobs across the state. The Joint Committee commissioned BW Research Partnership to produce this 2021 report, with financial support provided by the Connecticut Green Bank, Eversource, and AVANGRID, Inc., subsidiaries UI, SCG and CNG.

The 2021 Clean Energy Industry Report details historical clean energy employment from 2017 through 2020, using the Connecticut-specific definition of clean energy technologies.[2] Employment data is described by clean energy technology sector, their component sub-technologies, and industry or value chain segment. Also included in this year's report is an update to county-level employment, employer hiring difficulty, clean energy firms' contributions to Gross Regional Product (GRP), clean energy demographics, and some COVID-19 specific questions on workforce impacts and relief programs.

All data presented in this report is based on the 2021 United States Energy and Employment Report (USEER).[3]

About Energize CT and Joint Committee

Energize CT

Energize CT is an initiative of the Energy Efficiency Fund, the Connecticut Green Bank, the State and your local electric and gas utilities with funding from a charge on customer energy bills. **www.EnergizeCT.com**

Joint Committee

Pursuant to Section 16-245m(d)(2) of the Connecticut General Statutes, the Joint Committee shall examine opportunities to coordinate programs and activities contained in the plan developed under Section 16-245n(c) (i.e., Comprehensive Plan of the Green Bank) with the programs and activities contained in the plan developed under Section 16-245m(d)(1) (i.e., Conservation and Load Management Plan), and to provide financing to increase the benefits of programs funded by the plan developed under Section 16-245m(d)(1) so as to reduce the long-term cost, environmental impacts, and security risks of energy in the state.

To support the Joint Committee, the following is a principal statement to guide its activities: The Energy Efficiency Board and the Connecticut Green Bank have a shared goal to implement state energy policy throughout all sectors and populations of Connecticut with continuous innovation towards greater leveraging of ratepayer funds and a uniformly positive customer experience.

About the Members

The Connecticut Green Bank is the nation's first green bank. Its mission is to confront climate change and provide all of society a healthier and more prosperous future by increasing and accelerating the flow of private capital into markets that energize the green economy.

The Connecticut Department of Energy and Environmental Protection (DEEP) is charged with conserving, improving and protecting the natural resources and the environment of the state of Connecticut as well as making cheaper, cleaner and more reliable energy available for the people and businesses of the state. The agency is also committed to playing a positive role in rebuilding Connecticut's economy and creating jobs – and to fostering a sustainable and prosperous economic future for the state.

United Illuminating, Southern Connecticut Gas and Connecticut Natural Gas, subsidiaries of AVANGRID Inc. is a leading, sustainable energy company with $32 billion in assets and operations in 24 U.S. states. AVANGRID has two primary lines of business: Avangrid Networks and Avangrid Renewables. Avangrid Networks owns eight electric and natural gas utilities, serving 3.2 million customers in New York and New England.

Eversource is New England's largest energy delivery company, with approximately 3.7 million electric and natural gas customers in Connecticut, Massachusetts and New Hampshire.

[1] https://ctgreenbank.com/wp-content/uploads/2020/11/2020-Connecticut-Clean-Energy-Industry-Report.pdf
[2] For more information on what constitutes a clean energy job and which clean energy technologies are included in this report, please refer to Appendix B: Clean Energy Technology List.
[3] https://www.usenergyjobs.org/

Clean energy employment declines in Connecticut were lower compared to the overall statewide economy, the national clean energy labor market, and other clean energy economies in the Northeast.

The number of firms conducting alternative transportation and clean grid and storage work increased between 2019 & 2020.

Clean energy contributions to statewide GRP increased by two percent between 2019 and 2020 and by 14 percent since 2017.

Alternative transportation firms saw employment growth in 2020, led by job growth in the hybrid electric and electric vehicle sub-sectors.

Total clean energy employment declined by six percent in 2020.

In the last quarter of 2020, clean energy employment totaled to almost 41,500 jobs in Connecticut; this is roughly 2,600 less compared to the last quarter of 2019—a 5.9 percent decline in 12 months. Comparatively, Connecticut's clean energy market fared better than the overall statewide economy, the national clean energy labor market, and other clean energy economies in the Northeast. Economywide job losses in Connecticut totaled to more than 115,000 jobs, a decline of roughly seven percent; job losses in the clean energy industry accounted for about two percent of total statewide employment declines. Nationally, the clean energy industry declined by 9.1 percent, while clean energy employment in other states like Pennsylvania, Massachusetts, and Rhode Island declined by roughly seven to 16 percent.

Despite losses in 2020,clean energy employers are optimistic about job growth in 2021.

Clean energy firms project jobs will grow by just over eight percent, estimating an additional 3,400 clean energy jobs by the end of 2021. In fact, the clean energy economy already began to rebound in late 2020, with the majority of COVID-19-related employment losses concentrated in March through May. From June through December 2020, clean energy jobs saw continuous though modest growth. Between the last quarter of 2020 and the first quarter of 2021, Connecticut's clean energy economy continued its recovery trend, growing by an additional one percent in three months.

An Eversource-authorized contractor from CMC Energy Services cuts insulation for Home Energy Solutions℠ work in Wethersfield.

[4] For more information on monthly clean energy employment changes through 2020, please visit https://bwresearch.com/covid/.

Clean energy contributions to statewide Gross Regional Product (GRP) increased slightly between 2019 & 2020.

In 2020, clean energy firms contributed roughly $6.64 billion to statewide GRP, accounting for almost three percent of total GRP. Clean energy GRP increased by about two percent from 2019 through 2020 and by 14 percent since 2017. Overall, clean energy professional and business services accounted for about a third of total contributions to GRP, followed by manufacturing at roughly 27 percent and utilities at 21 percent. Construction and wholesale trade accounted for roughly 10 percent each while agriculture and forestry and other services, such as repair and maintenance, represented less than a percent of clean energy GRP contributions.

Solar jobs declined by 6.8 percent in 2020.

There were 2,645 total solar jobs in Connecticut by the end of 2020, a net decrease of 193 workers compared to the last quarter of 2019. Compared to the 2011 baseline, solar employment remains 113 percent higher.

[5] It is important to note that FTE jobs are not the same as "full-time equivalent" in terms of representing 40 hours of work per week. FTE clean energy jobs are unrelated to how many hours worked but refer solely to the proportion of total hours that are dedicated to clean energy activities, whether the worker be part-time or full-time. In other words, if a clean energy worker works 20 hours per week but dedicates all 20 hours to clean energy-related work, then this worker would be counted as one clean energy FTE.

The alternative transportation sector grew in 2020.

Despite job losses across all other sectors, employment in the alternative transportation sector grew by almost seven percent between 2019 and 2020, resulting in the creation of almost 130 new jobs spread largely across manufacturing, wholesale trade, and repair and maintenance. Both the hybrid electric and electric vehicle sub-sectors grew by about 14 and 16 percent, respectively. Growth in hybrid electric and electric vehicle employment was seen both nationally and across other statewide clean energy economies.

There were 27,939 full-time equivalent (FTE) clean energy workers at the end of 2020.

The number of FTE clean energy jobs[5] declined by 10.3 percent in 2020, a reduction of just over 3,200 workers that spend all of their labor hours on clean energy-related activities. Compared to 2015, full-time equivalent clean energy jobs were still two percent higher than the baseline.

Energy efficiency employment declined by 6.7 percent, or just over 2,400 jobs.

High efficiency and traditional HVAC firms shed the highest number of jobs, with more than 1,300 jobs lost in 2020. ENERGY STAR® and efficient lighting firms shed more than 500 jobs (-6.2 percent) while employment in advanced materials declined by just over 260 jobs (-7.2 percent).

Given these losses in the energy efficiency sector, clean energy construction took the biggest hit in 2020.

The construction industry lost almost 1,300 workers, for a decline of 6.4 percent between 2019 and 2020; this was the greatest total decline and percent decline. Professional and business services declined by 6.2 percent (-762 jobs), followed by wholesale trade with just over 300 jobs lost (-6.3 percent). Clean energy manufacturing firms shed jobs at a rate of 4.4 percent (-141 jobs).

Clean Energy Demographics

Connecticut's clean energy workforce was slightly more diverse in 2020.

The proportion of White clean energy workers decreased by just over one point while the proportion of Hispanic or Latinx and Black or African American workers increased by roughly one percentage point each. In 2019, White clean energy workers accounted for 82 percent of the workforce; this decreased to 80.8 percent in 2020. Hispanic or Latinx workers went from comprising 10.1 percent of the clean energy workforce in 2019 to representing 11.1 percent of clean energy workers in 2020. Similarly, the proportion of Black or African American workers also increased slightly, from 5.8 percent in 2019 to 6.3 percent in 2020.

Clean Energy Hiring & Covid-19 Impacts

Few clean energy firms were hiring in 2020, but those who were hiring expressed significant hiring difficulty.

About eight in ten clean energy firms (83 percent) indicated that they had adequate clean energy workers to meet their needs. Of the 17 percent that indicated they did not, roughly six in ten (57 percent) were hiring for new positions or vacancies in 2020. Of firms engaged in hiring activity throughout 2020, 92 percent indicated that hiring was difficult; this was eight points higher than the national clean energy average of 84 percent. In Connecticut, 45 percent of firms reported hiring had been very difficult, compared to 37 percent of clean energy firms nationwide.

Of clean energy firms that reported workforce impacts from COVID-19, the majority temporarily laid off their staff.

Three in ten surveyed firms indicated that they had to either lay off, furlough, or reduce pay for their clean energy staff in 2020. Of these companies, 55 percent reported that they had to temporarily lay off clean energy employees, 33 percent had to furlough their clean energy workers, eight percent reported a reduction in hours, and four percent indicated reduced payor benefits for clean energy staff.

Few clean energy firms indicated that they received financial support from emergency funds in 2020.

Two- thirds of surveyed clean energy firms reported that they did not receive any emergency funds in 2020, while about a third indicated that they received assistance through a local emergency loan program. Seventeen percent of surveyed clean energy companies reported that they received support through the Paycheck Protection Program (PPP).

Overall Clean Energy Jobs

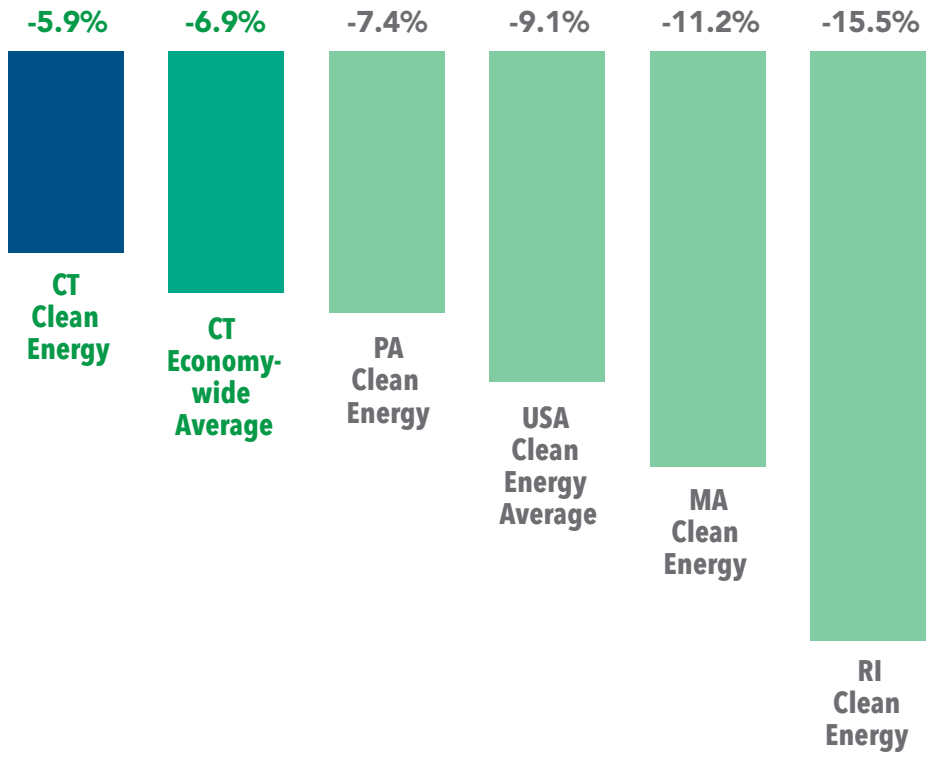
In 2020, clean energy employment declined by **5.9 percent**, totaling about 41,500 jobs for a decline of just over 2,600 workers in 12 months.

The COVID-19 pandemic wiped out nearly four years of clean energy employment growth across the state, sending Connecticut's clean energy labor market back to 2016 employment levels. By comparison, using the latest available data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW), the overall statewide labor market in Connecticut contracted by about seven percent, **a loss of more than 115,000 jobs.** Job losses in the clean energy industry accounted for about two percent of total statewide employment declines.[6]

Connecticut's clean energy industry fared better than the national clean energy labor market, which declined by just over nine percent over the same time, as well as other regions in the Northeast. Clean energy employment in Pennsylvania, Massachusetts, and Rhode Island declined by seven to 16 percent between the last quarters of 2019 and 2020.

Figure 1

Employment Change Comparisons, 2019-2020

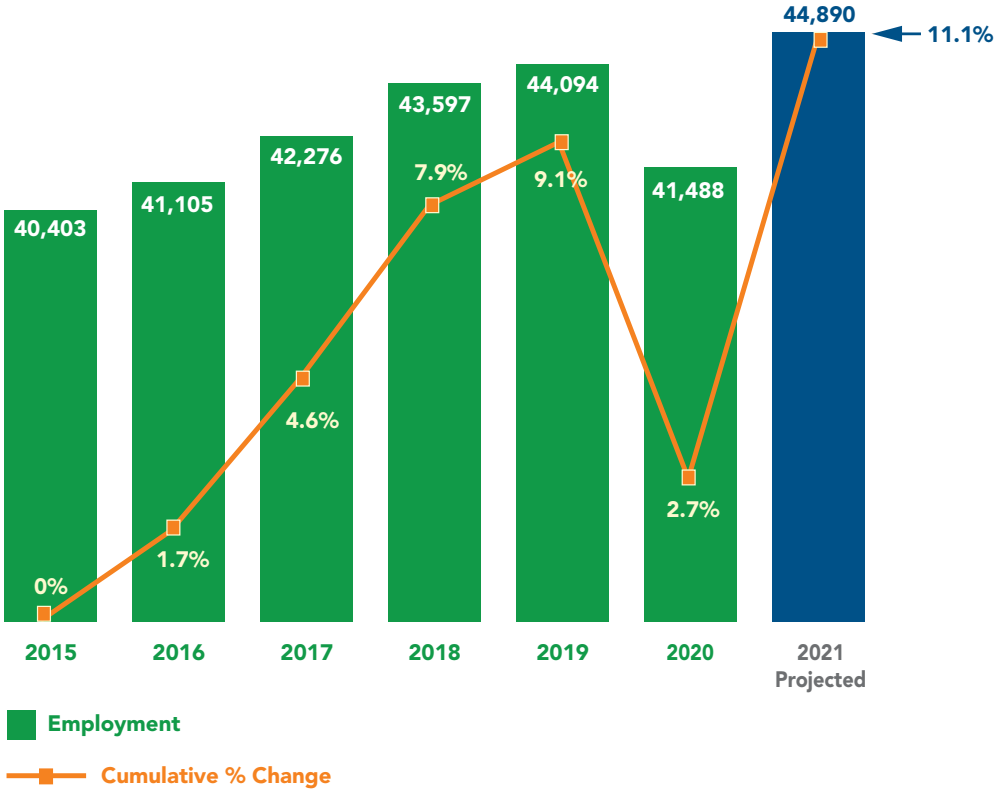


[6] Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW). Annual 2017-2019 & September 2020. Data accessed April 2021.

Overall Clean Energy Jobs

Figure 2

Clean Energy Employment In Connecticut 2015-2021 Projected



Despite employment losses throughout 2020, clean energy employers in the state are optimistic about job growth over 2021. Connecticut's clean energy industry projected an 8.2 percent employment growth in 2021– estimating the addition of roughly 3,400 clean energy jobs.

Connecticut's clean energy economy already began to rebound in late 2020, with most COVID-19-related employment losses concentrated from March through May. From June through December 2020, clean energy jobs saw continuous though modest growth.[7]

As directed by the Department of Energy and Environmental Protection in collaboration with the Connecticut Green Bank, the Department of Economic and Community Development, the Energy Efficiency Board, the Utilities, and energy efficiency contractors, several changes were instituted to preserve jobs in the energy efficiency sector and ramp-up industry activity in response to COVID-19.

Actions taken to support and protect the Connecticut energy efficiency workforce included:

Temporary administrative fee payments and interim job payments to energy efficiency vendors to offset unpredictable cashflows.

Virtual webinars to help businesses mitigate the virus transmission, access state and federal assistance, and implement efficiency improvements.

Virtual pre-assessments, audits, and inspections to provide a safety-conscious alternative to in-person energy assessments.

Temporarily increased incentives, extended contract/rebate expiration periods, and streamlined eligibility requirements for residential and commercial and industrial projects to boost program activity and provide economic relief to residents and businesses.

Comprehensive **Health and Safety Protocols** and training to ensure that energy efficiency contractors could safely resume on-site energy efficiency work.

[7] For more information on monthly clean energy employment changes through 2020, please visit https://bwresearch.com/covid/.

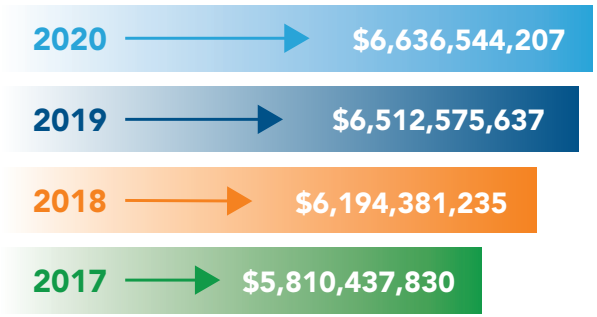
Overall Clean Energy Jobs

In 2020, clean energy accounted for $6.64 billion of Connecticut's Gross Regional Product (GRP).

This represents a 14.2 percent increase since 2017 and a roughly two percent increased between 2019 and 2020.[8] Clean energy professional and business services accounted for roughly a third of total GRP contributions, followed by manufacturing at 27 percent and utilities at 21 percent.

Clean Energy Gross Regional Product (GRP) 2017-2020

Figure 3



[8] Total Connecticut Gross Regional Product (GRP) from Bureau of Economic Analysis (BEA), 2020, real GRP in millions of chained 2012 dollars.

Clean Energy Gross Regional Product (GRP) By Value Chain, 2019-2020

Table 1

	2019 Clean Energy GRP	2020 Clean Energy GRP	% Change	Proportion
Professional and Business Services	$2,132,314,808	$2,141,634,503	0.4%	32.3%
Manufacturing	$2,078,550,283	$1,810,522,268	-12.9%	27.3%
Utilities	$1,057,284,841	$1,364,545,000	29.1%	20.6%
Construction	$692,684,480	$659,618,808	-4.8%	9.9%
Wholesale Trade	$527,047,849	$635,027,082	20.5%	9.6%
Other Services	$18,662,106	$21,312,037	14.2%	0.3%
Agriculture and Forestry	$6,031,271	$3,884,509	-35.6%	0.1%
TOTAL	**$6,512,575,637**	**$6,636,544,207**	**1.9%**	

Overall Clean Energy Jobs

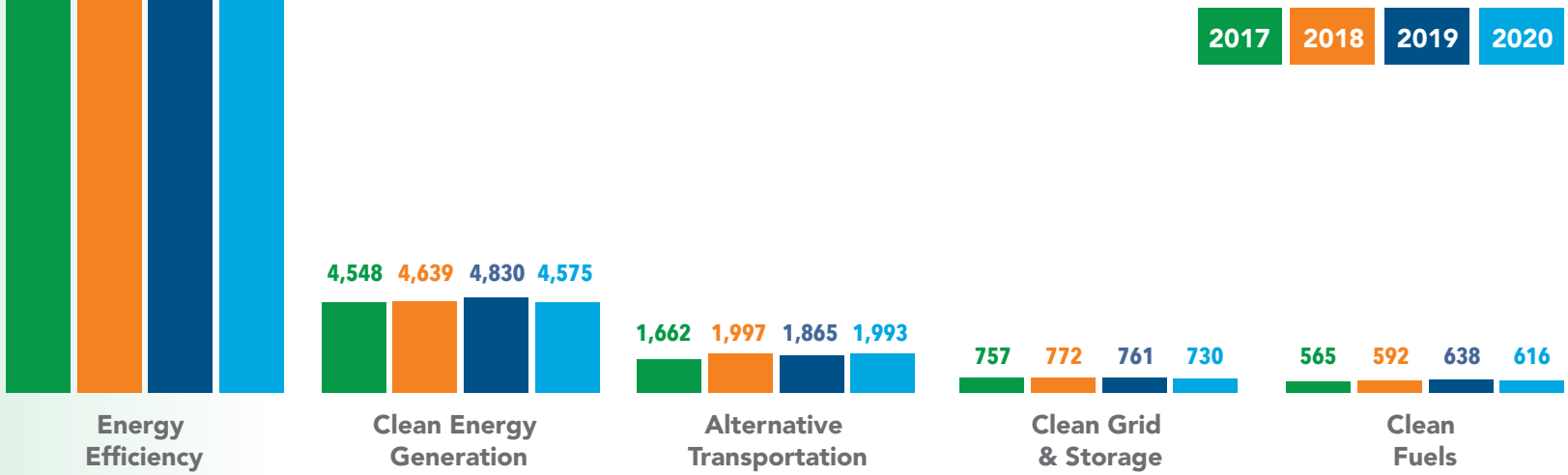
Nearly all technology sectors, with the exception of alternative transportation, saw employment declines in 2020.

The energy efficiency sector shed the highest number of jobs and also had the greatest percent decline with a loss of just over 2,400 workers or a decline of 6.7 percent compared to the last quarter of 2019. Clean energy generation firms saw employment decline by 5.3 percent, or 255 jobs, followed by clean grid and storage and clean fuels firms which shed a collective 50 jobs in 2020.

The alternative transportation sector grew by almost seven percent, resulting in 128 new alternative transportation jobs in 2020.

Clean Energy Employment By Sector, 2017 – 2020

Figure 4



Overall Clean Energy Jobs

There were 4,284 clean energy establishments in 2020 across Connecticut, about 60 fewer firms compared to 2019 or a 1.4 percent decline.

Overall, there was a slight decline in energy efficiency, clean energy generation, and clean fuels firms. Conversely, the number of firms conducting alternative transportation and clean grid and storage work in 2020 increased by 5.6 and 7.4 percent, respectively.

Clean Energy Establishments by Sector, 2017-2020

Table 2

SECTORS	2017	2018	2019	2020
Energy Efficiency	3,677	3,728	3,833	3,771
Clean Energy Generation	223	241	258	247
Alternative Transportation	172	194	177	187
Clean Grid & Storage	28	31	27	29
Clean Fuels	58	59	52	50
TOTALS	**4,159**	**4,253**	**4,347**	**4,284**

Full-Time Equivalent Clean Energy Jobs

FTE clean energy jobs represent a subset of total clean energy jobs from Figure 1 (pg 9) in the previous section.

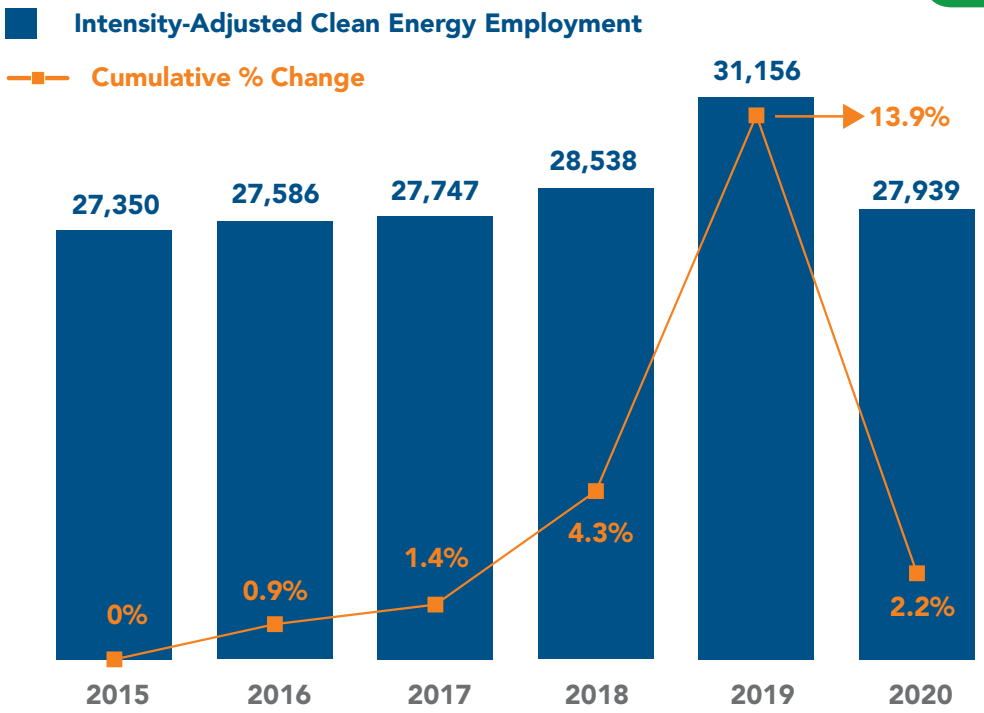
FTE jobs are a useful metric to identifying the extent of clean energy activity going on in a state. An increase in FTE jobs indicates that more clean energy workers are dedicating an increasing amount of their work week, or labor hours, to clean energy-specific activities possibly due to increased policy support and financial incentives creating more demand for clean energy goods and services. For instance, a traditional HVAC worker might have spent only a quarter of their work week installing or maintaining energy efficient HVAC technologies in 2017. But if a state began offering rebates in 2018 for efficient heat pumps, that traditional HVAC worker would likely now be spending the majority of labor hours in a work week installing high efficiency heat pumps. This increase in clean energy-related activity per worker translates to more FTE clean energy jobs.[9]

As of the last quarter of 2020 there were 27,939 FTE clean energy jobs in Connecticut—a decline of 10.3 percent in 12 months, or about 3,200 fewer FTE clean energy workers. Compared to the baseline in 2015, FTE clean energy jobs were still about two percent higher.

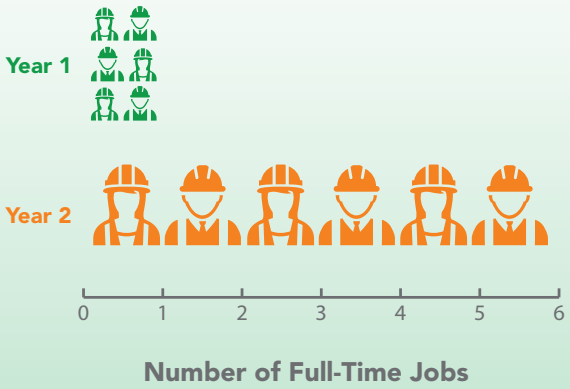
[9] It is important to note that FTE jobs are not the same as "full-time equivalent" in terms of representing 40 hours of work per week. FTE clean energy jobs are unrelated to how many hours worked but refer solely to the proportion of total hours that are dedicated to clean energy activities, whether the worker be part-time or full-time. In other words, if a clean energy worker works 20 hours per week but dedicates all 20 hours to clean energy-related work, then this worker would be counted as one clean energy FTE.

Full-Time Equivalent Clean Energy Jobs, 2015-2020[10]

Figure 5



FTE Clean Energy Jobs Explained



An example can illustrate the importance of tracking FTE clean energy employment. If a Heating, Ventilation, and Air Conditioning (HVAC) firm had 6 installers in 2018 who occasionally installed heat pumps, and now has 6 installers who exclusively do so, there would be no change in the total number of clean energy workers reported. However, because the number of labor hours working with heat pumps has increased, FTE jobs would show a corresponding increase.

[10] These jobs were extrapolated using a combination of state-level and census region data. The data was adjusted based on revenue distribution by technology and weighted according to how much time workers were reported to spend on clean energy activities (0-49 percent, 50-99 percent, or 100 percent). For a full description of this methodology, please refer to Appendix A.

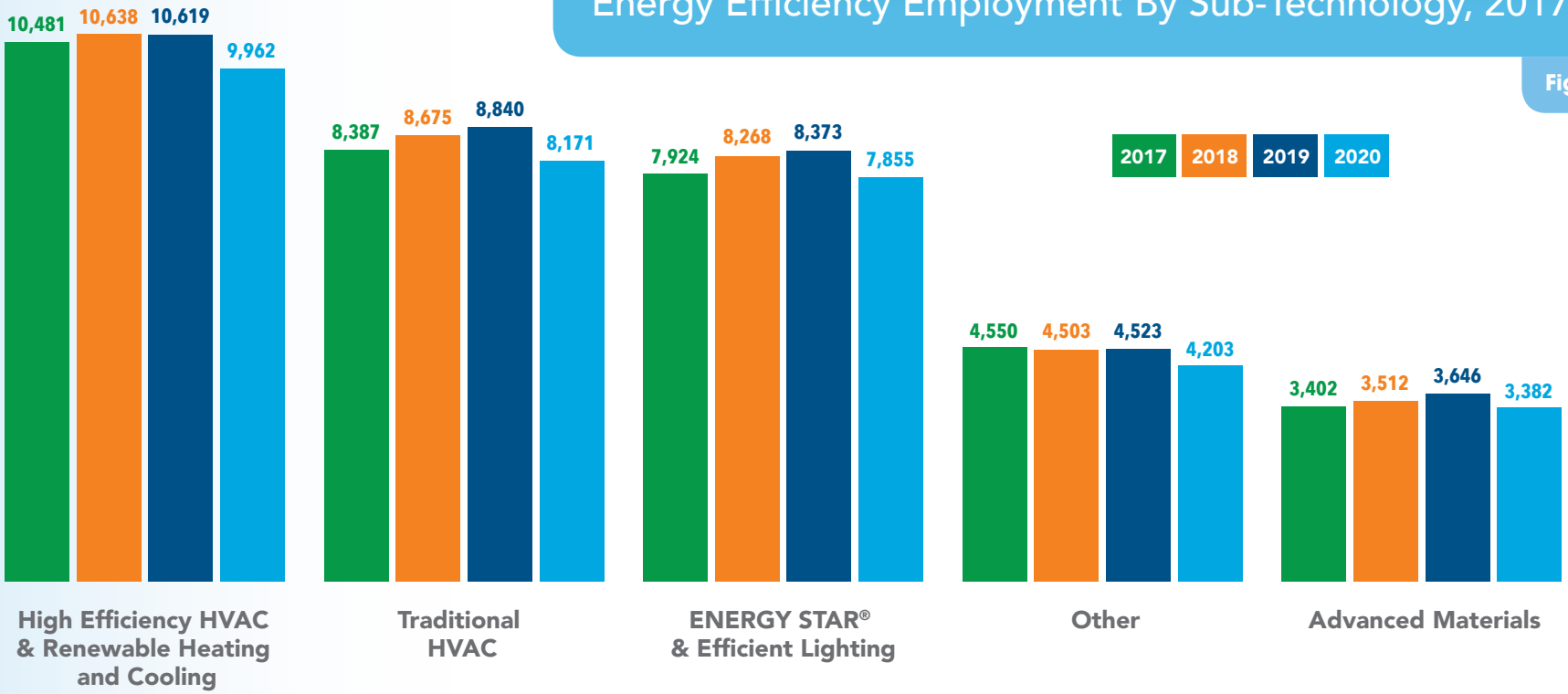
Energy Efficiency

All energy efficiency sub-technologies saw employment declines in 2020.

The largest energy efficiency sub-sector in Connecticut, high efficiency HVAC and renewable heating and cooling, declined by almost 660 jobs or 6.2 percent between 2019 and 2020. Traditional HVAC firms shed almost 670 workers for a 7.6 percent decline in jobs. ENERGY STAR and efficient lighting firms shed more than 500 jobs (-6.2 percent) while employment in advanced materials declined by just over 260 jobs (-7.2 percent).

Energy Efficiency Employment By Sub-Technology, 2017-2020[11]

Figure 6



[11] Traditional HVAC workers are those individuals that spend at least a portion, or less than half, of their time on energy-efficient heating and cooling technologies and the remainder on traditional, non-efficient technologies. High efficiency HVAC workers dedicate the majority to all of their labor hours to efficient HVAC technologies. For more information, please refer to the Clean Energy Technology List and definitions in Appendix B.

MARC Community Resources • Middletown, CT

MARC began as a grassroots organization in 1955 spearheaded by eight families desperate for help and support for their children with intellectual and developmental disabilities.

Over the years, the nonprofit has established a far-reaching history of empowering people to realize their dreams and make choices about their lives. Today it is an aliated chapter of The Arc Connecticut and provides 130 individuals and families in Middlesex County a range of residential, vocational, leisure, advocacy, and outreach services.

Challenge

Like many non-profits, MARC's funding sources are limited and the money is typically earmarked for program support before facility upgrades. When Linda C. Iovanna, president and CEO of MARC, joined the organization in 2015, she quickly realized the programs and infrastructure within the three existing satellite spaces were at capacity. She was also faced with many of the same challenges experienced by business owners who want to centralize operations: access to in-house expertise, time and capital. MARC began searching for a new location and needed a team of experts to help evaluate options and navigate the challenges.

Solution

While the search for a location took longer than anticipated, when the team toured 25 Industrial Park Place in July 2018 it moved ahead with focus and determination. MARC closed on the property in July 2019 after an OPM grant of $487,500 was secured and People's Bank committed to a construction loan. The build-out designs were specified, revised and revised again. Intending to complete the renovation and build-out by Spring 2020, the team began to prepare for the transition to their new space.

Results

- A $35,500 reduction in energy and transportation costs compared to operating 3 buildings
- New heating and cooling units and controls which save more than 45,000 kWh of energy annually
- Lighting upgrades that save an additional 132,000 kWh annually
- Reduced strain on transportation team
- Financial incentives and technical support

"The quality of the space we're in now is so much nicer and we finally have the room to do things we couldn't do before. We have a separate cafeteria, an outdoor patio and we're able to move to ancillary rooms for art, music and a beautiful new computer lab, which we were able to build because of the savings. We are also excited to see how the year-after-year energy savings will help us grow and expand."

Linda C. Iovanna, Former President and CEO of MARC

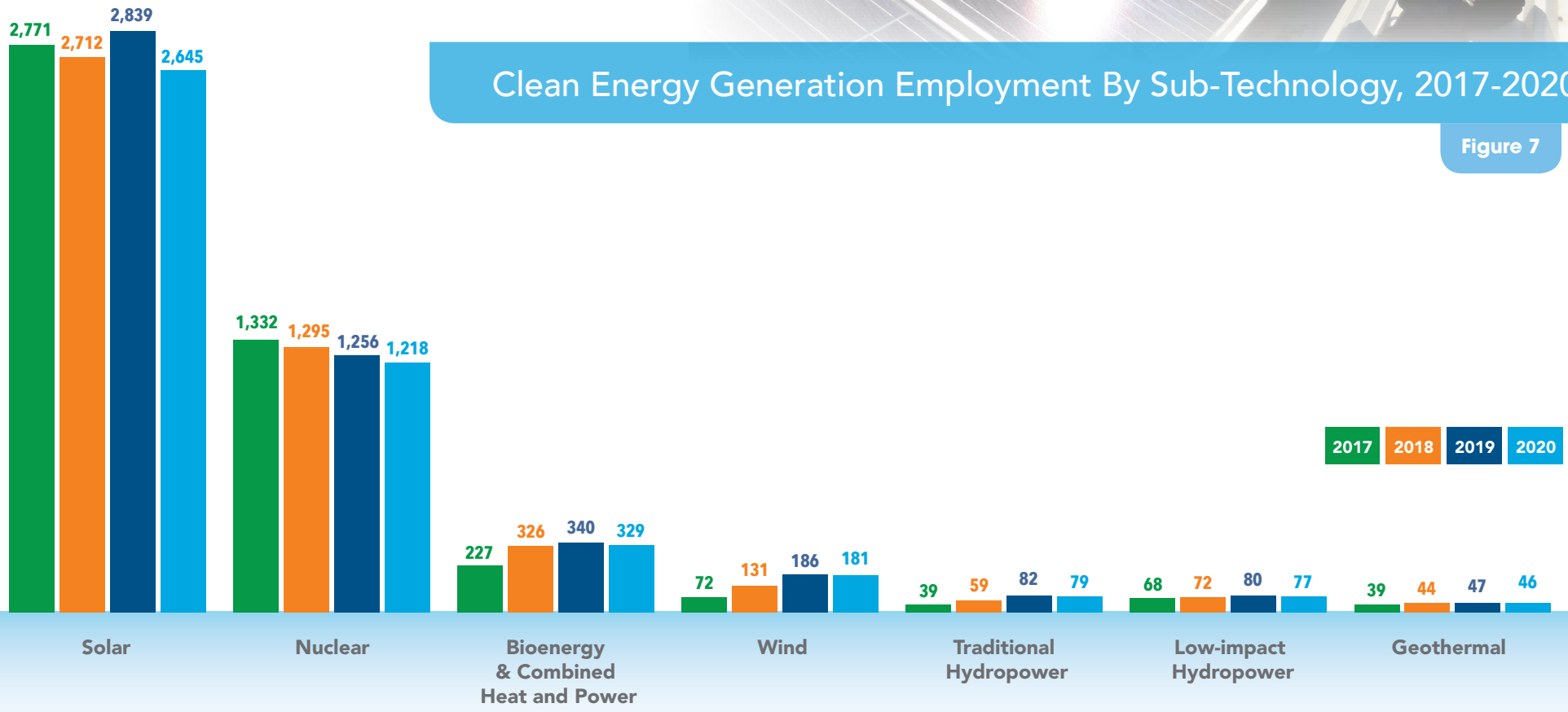
The majority of job losses in the clean energy generation sector were from solar companies.

Between 2019 and 2020, solar employment declined by almost 200 jobs (-6.8 percent). Compared to the 2011 baseline, solar employment remains 113 higher.

Employment in the nuclear electric power generation sub-sector declined by three percent, a loss of about 40 jobs, followed by bioenergy and combined heat and power (-3.4 percent or 12 jobs lost). The remaining clean energy generation sub-sectors all declined by less than 10 jobs.

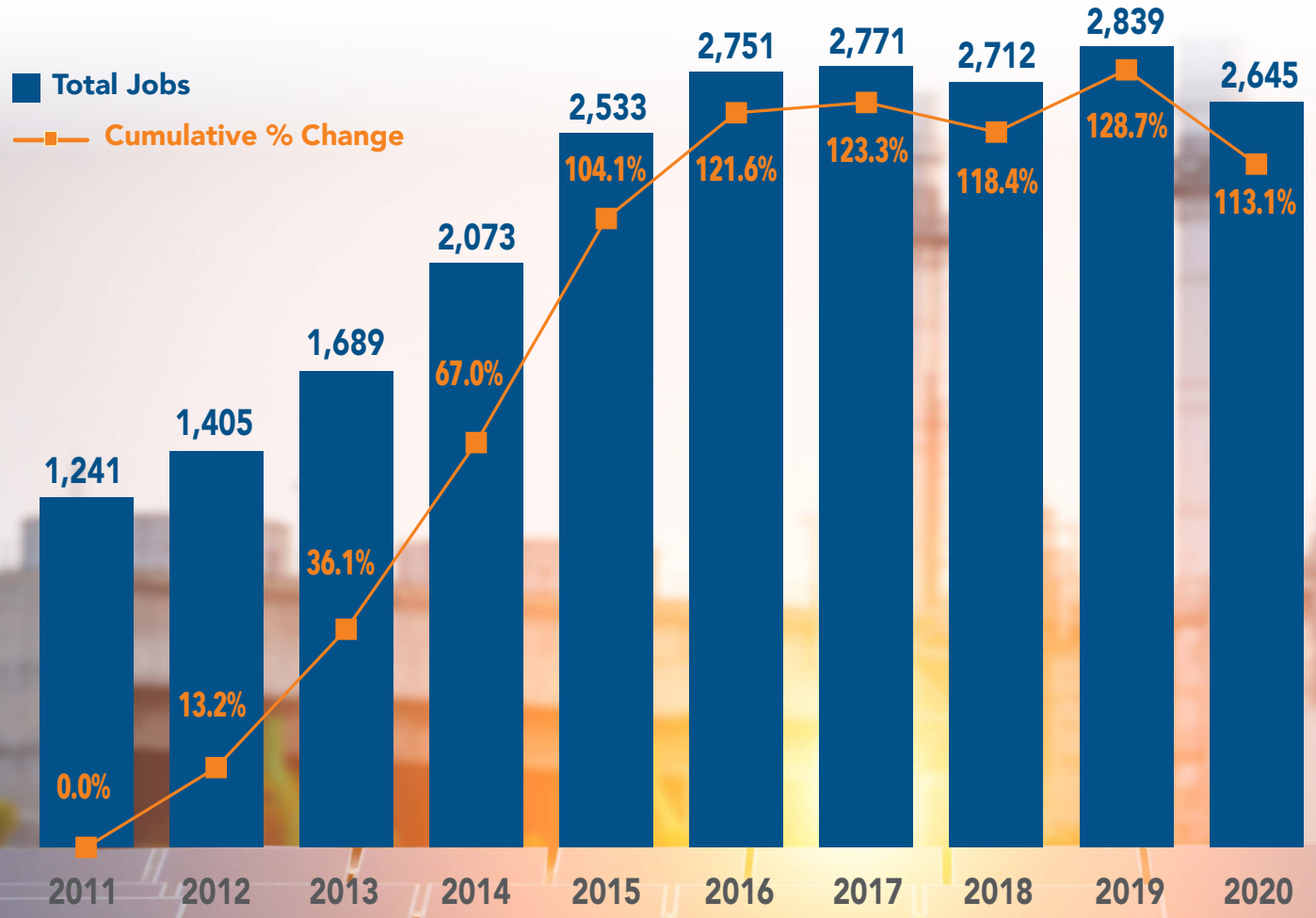
Clean Energy Generation Employment By Sub-Technology, 2017-2020

Figure 7



Solar Employment, 2011-2020

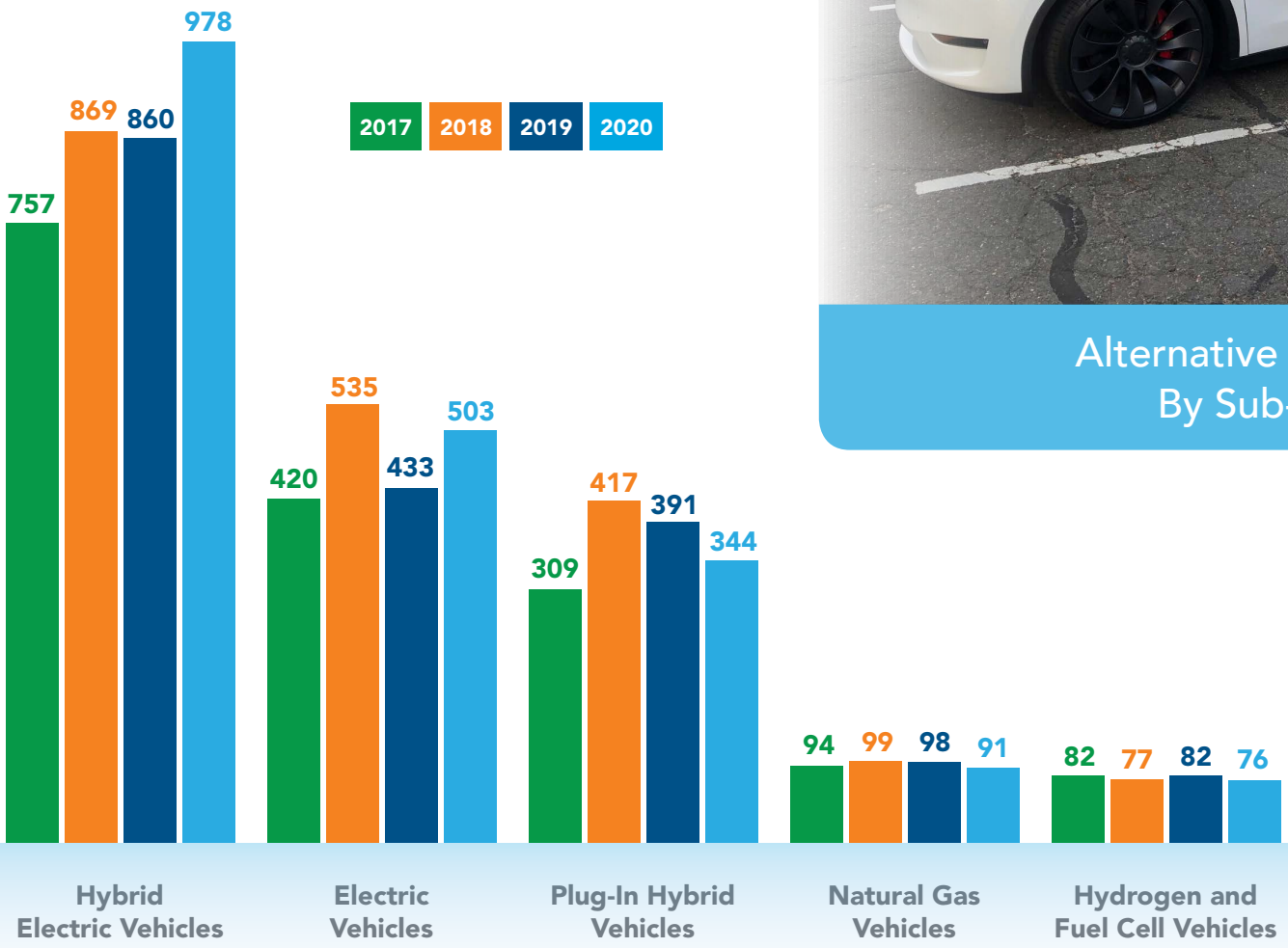
Figure 8



Alternative Transportation

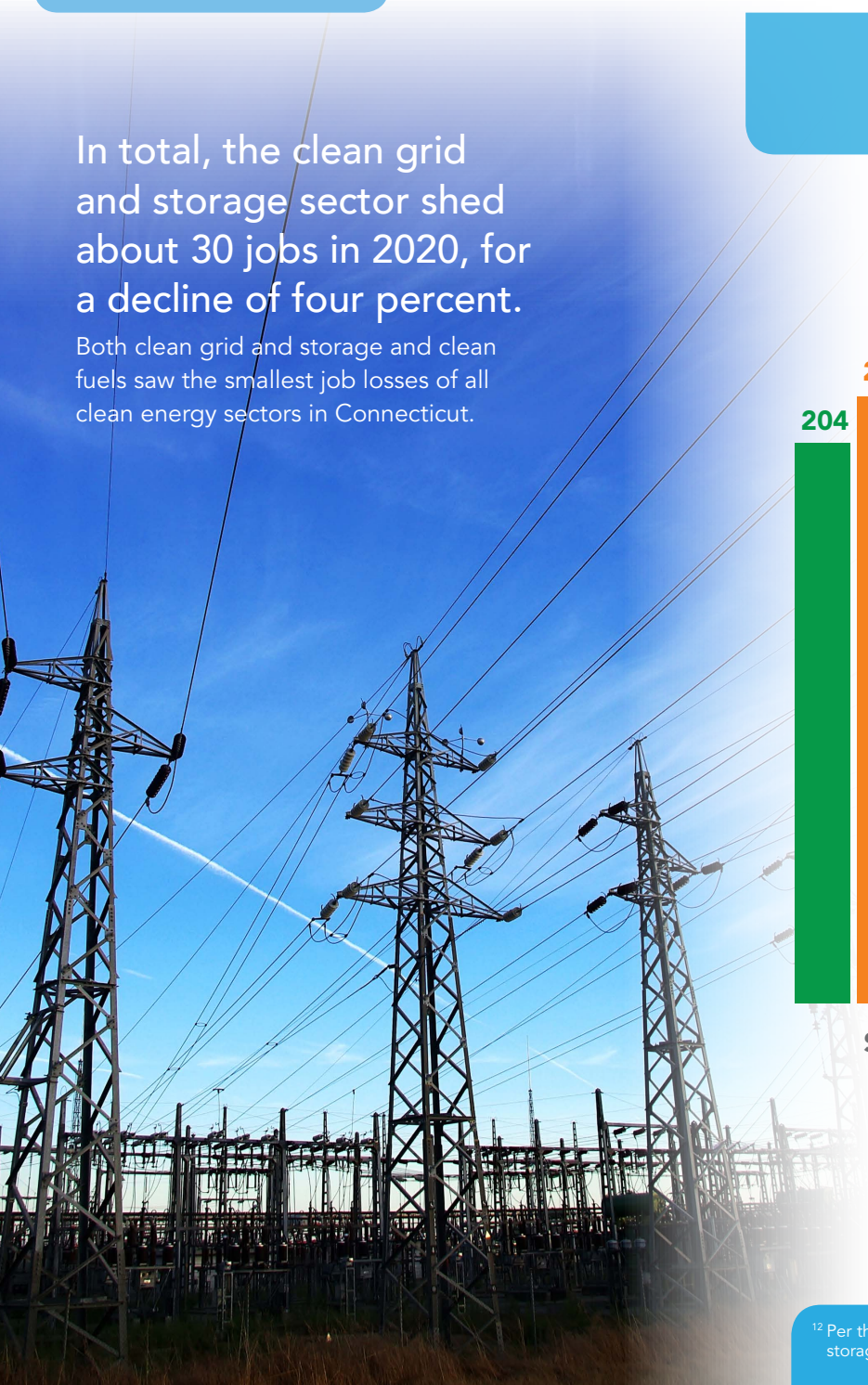
Collectively, hybrid electric and electric vehicles firms added 188 new jobs to the clean energy labor market in 2020.

These firms saw job growth despite economy and sector-wide employment losses. Job losses in the plug-in hybrid, natural gas, and hydrogen and fuel cell vehicle sub-sectors resulted in the net gain of roughly 128 alternative transportation jobs in Connecticut.



Alternative Transportation Employment By Sub-Technology, 2017-2020

Figure 9

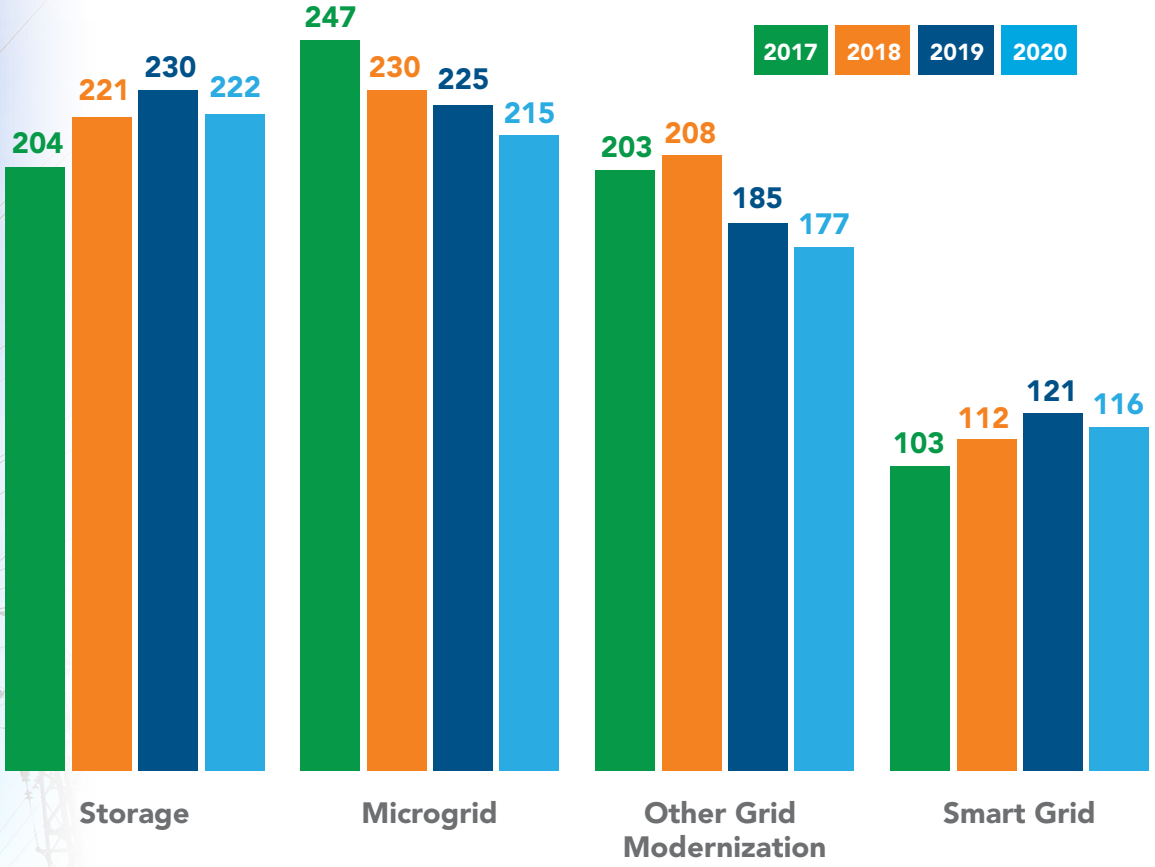


In total, the clean grid and storage sector shed about 30 jobs in 2020, for a decline of four percent.

Both clean grid and storage and clean fuels saw the smallest job losses of all clean energy sectors in Connecticut.

Clean Grid And Storage Employment By Sub-Technology, 2017-2020[12]

Figure 10



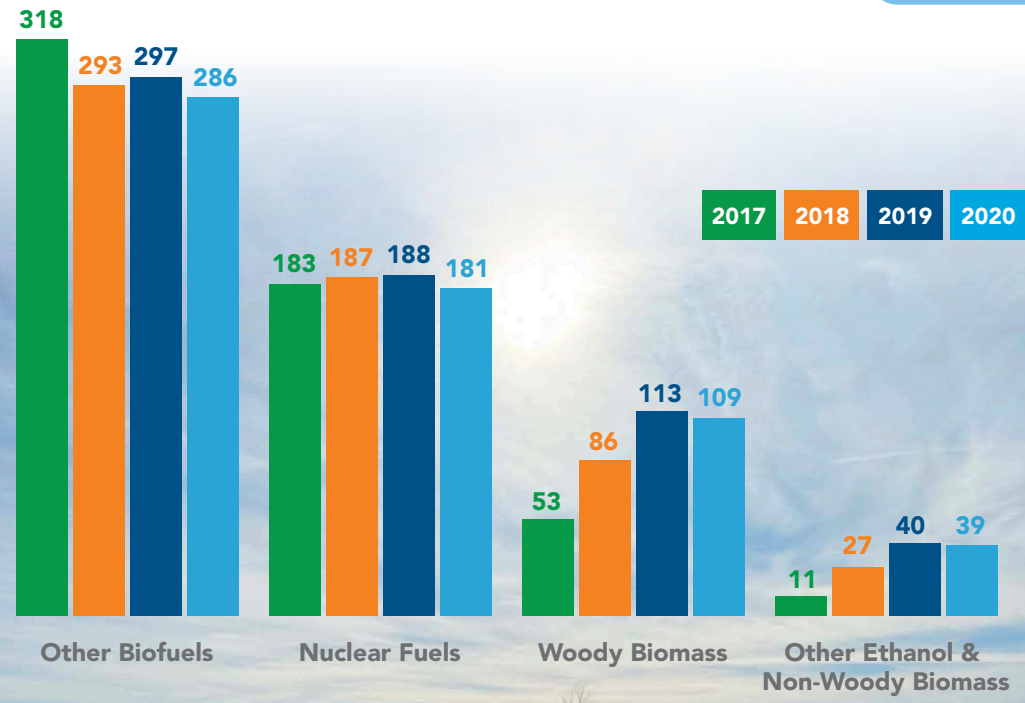
[12] Per the Connecticut definition, storage companies include pumped hydropower storage, battery storage (including battery storage for solar generation), mechanical storage, thermal storage, biofuels (including ethanol and biodiesel), and nuclear fuels.

Clean Fuels

Clean Fuels Employment By Sub-Technology, 2017-2020[13]

Figure 11

Collectively, clean fuels firms shed roughly 20 jobs across all sub-technologies; nearly all sub-sectors shed about 10 jobs or less between 2019 and 2020.



First Biogas Dairy Digester in Connecticut

Fort Hill Farms in Thompson became Connecticut's first biogas dairy digester system that recycles food waste and manure into renewable energy and soil products. The project is moving forward thanks to a partnership between the farm, Live Oak Bank, the Connecticut Green Bank, and Ag-Grid Energy. When completed, the digester is expected to produce 550 kilowatts of electricity and reduce 25,000 tons of organic waste annually. Fort Hill Farms is a fourth-generation farm that currently has over 400 cows, 230 milking, and is part of two dairy farm cooperatives named The Farmer's Cow and Agri-Mark (Cabot Cheese), which supplies products to both large, big box groceries and local markets.

[13] Other ethanol and non-woody biomass (including biodiesel) covers all fuels made from other materials such as straw, manure, vegetable oil, animal fats, etc.

The proportion of White clean energy workers decreased slightly compared to 2019, from 82 percent to 80.8 percent.

At the same time, Hispanic or Latinx workers increased by one point, from representing 10.1 percent of the workforce in 2019 to 11.1 percent of clean energy workers in 2020. The proportion of Black or African American workers also increased slightly since 2019, from 5.8 percent to 6.3 percent. Conversely, the proportion of Veterans in Connecticut's clean energy workforce declined from 10.6 percent in 2019 to 9.9 percent in 2020.

Clean Energy Workforce Demographics, 2020[14]

Table 3

Workforce Demographic	Connecticut Clean Energy	Connecticut Overall	US Clean Energy	US Overall
Male	72.3%	51.1%	72.6%	52.4%
Female	27.7%	48.9%	27.4%	47.6%
Hispanic or Latino	11.1%	14.8%	16.5%	17.3%
Not Hispanic or Latino	88.9%	85.2%	83.5%	82.7%
American Indian or Alaska Native	0.9%	0.3%	1.4%	0.8%
Asian	6.3%	5.1%	8.2%	6.5%
Black or African American	6.3%	11.5%	8.4%	12.7%
Native Hawaiian or other Pacific Islander	0.7%	0.0%	1.0%	0.2%
White	80.8%	80.7%	73.1%	77.2%
Two or more races	5.1%	2.5%	7.9%	2.7%
Veterans	9.9%	4.0%	9.0%	5.9%
55 and over	14.1%	26.1%	13.5%	22.3%

[14] Demographic data is pulled from the United States Energy and Employment Report 2021 (USEER 2021); the Bureau of Labor Statistics: Current Population Survey, and Veterans News Release; as well as JobsEQ Population Demographics.

Overall Value Chain Jobs

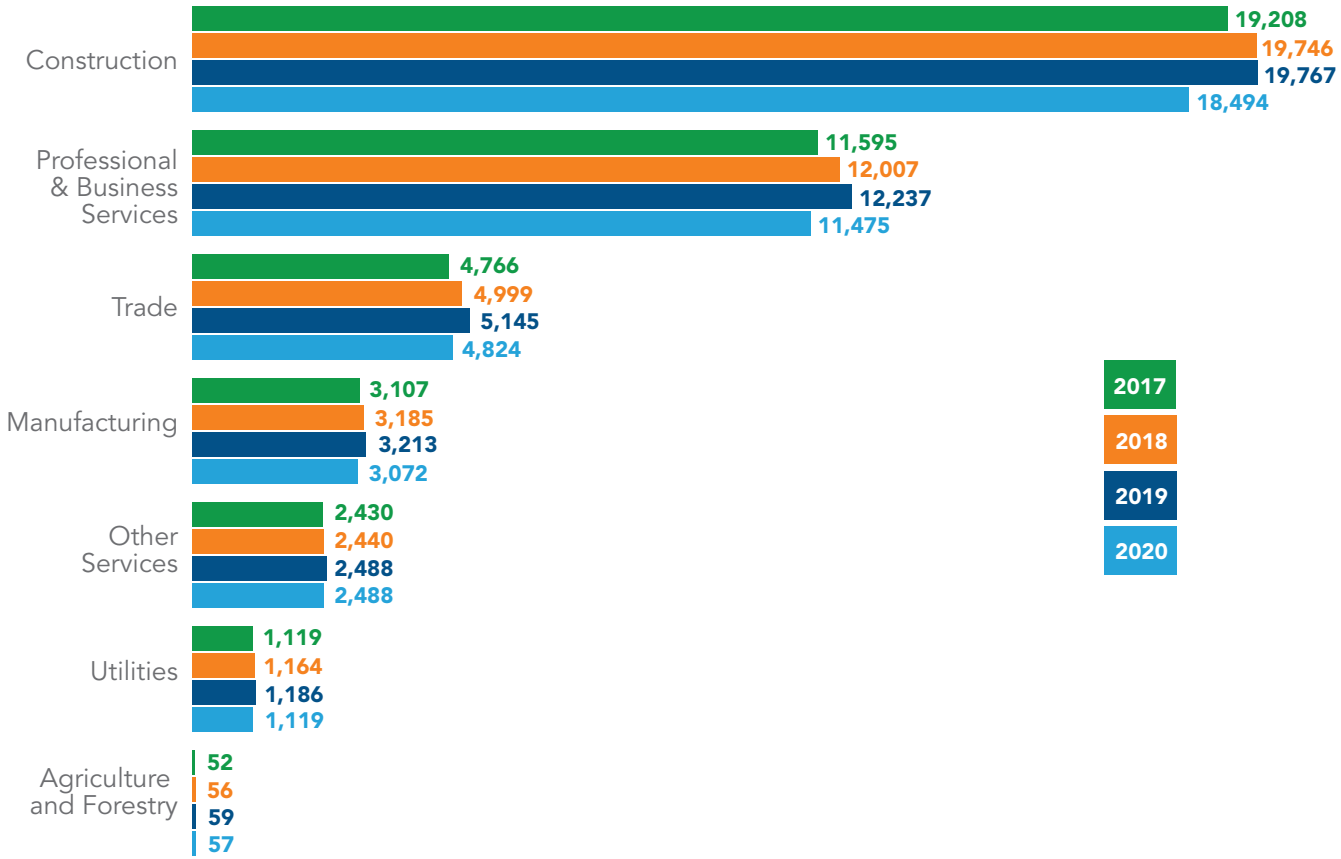
The clean energy construction industry saw the largest total decline and percent decline in jobs in 2020.

Overall, clean energy construction firms shed almost 1,300 workers, for a decline of 6.4 percent between the last quarters of 2019 and 2020. Professional and business services, which includes consulting, finance, legal, or research support declined by 6.2 percent (-762 jobs), followed by wholesale trade with a decline of 6.3 percent or 322 jobs. Clean energy manufacturing firms shed 141 jobs (-4.4 percent).

The utilities sector declined by 5.7 percent, a loss of 67 jobs, while other services, which largely consists of automotive repair and maintenance, lost 39 jobs for a rate of 1.6 percent. The agriculture and forestry industry in Connecticut is small, and employment remained fairly flat between 2019 and 2020.

Clean Energy Employment By Value Chain Segment, 2017-2020

Figure 12



On average, construction jobs account for 45 percent of all clean energy employment in Connecticut.

For the clean grid and storage (63 percent) and energy efficiency (50 percent) sectors, construction activity accounts for half or more of total jobs. Within the alternative transportation sector, all value chain segments experienced growth in 2020, with the majority of job growth concentrated in manufacturing, wholesale trade, and other services, which is largely comprised of automotive repair and maintenance.

Value Chain Employment by Clean Energy Sector, 2020

Table 5

Clean Energy Sector	Clean Energy Generation	Clean Grid & Storage	Energy Efficiency	Clean Fuels	Alternative Transportation	TOTAL
Agriculture and Forestry	-	-	-	57	-	**57**
Utilities	1,119	-	-	-	-	**1,119**
Construction	1,217	457	16,819	-	-	**18,494**
Manufacturing	336	61	2,169	160	346	**3,072**
Trade	408	37	3,644	337	398	**4,824**
Professional & Business Services	827	140	10,342	59	107	**11,475**
Other Services	669	35	599	3	1,143[15]	**2,448**
TOTAL	**4,576**	**730**	**33,573**	**616**	**1,993**	**41,488**

Value Chain Proportional Employment By Clean Energy Sector, 2020

Table 6

Clean Energy Sector	Clean Energy Generation	Clean Grid & Storage	Energy Efficiency	Clean Fuels	Alternative Transportation	Connecticut Clean Energy Average
Agriculture and Forestry	0.0%	0.0%	0.0%	9.2%	0.0%	0.1%
Utilities	24.5%	0.0%	0.0%	0.0%	0.0%	2.7%
Construction	26.6%	62.6%	50.1%	0.0%	0.0%	44.6%
Manufacturing	7.3%	8.4%	6.5%	26.0%	17.3%	7.4%
Trade	8.9%	5.1%	10.9%	54.8%	19.9%	11.6%
Professional & Business Services	18.1%	19.2%	30.8%	9.5%	5.4%	27.7%
Other Services	14.6%	4.8%	1.8%	0.4%	57.3%	5.9%

[15] These jobs are mostly focused on automotive repair and maintenance for alternative and clean fuel vehicle technologies.

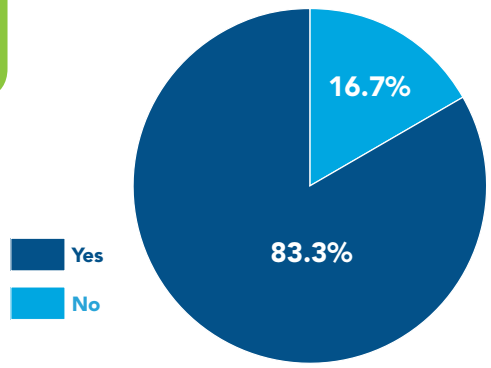
Hiring Difficulty

At the end of 2020, about eight in ten clean energy employers indicated that they had an adequate number of qualified clean energy employees to meet their current needs.

Of the 17 percent that indicated they did not have an adequate supply of workers, more than half of these firms (57 percent) indicated that they were currently searching or had recently searched for employees to fill vacancies or new positions.

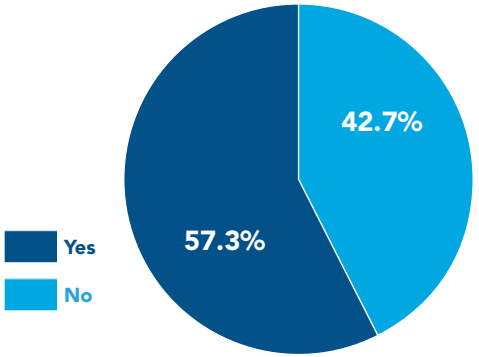
Adequate Workers To Meet Current Needs, 2020

Figure 13



Actively Hiring For New Positions or Vacancies, 2020

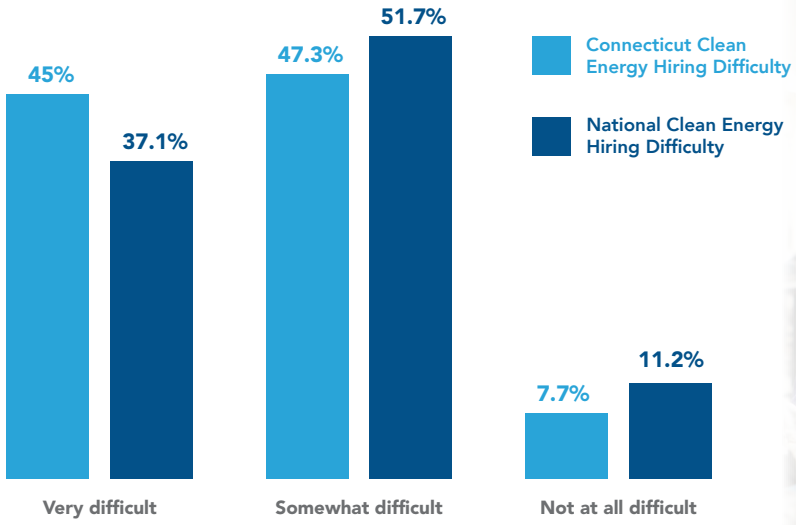
Figure 14



Employer-Reported Hiring Difficulty, 2020

Figure 15

Of clean energy firms that were hiring in 2020, 92 percent indicated some level of hiring difficulty, with 45 percent reporting that hiring had been very difficult and 47 percent indicating hiring was somewhat difficult. Hiring difficulty in Connecticut was slightly higher than the national clean energy average of 84 percent.



COVID-19 Impacts

Three in ten firms indicated that they had to lay off, furlough, or reduce pay for their clean energy workers as a result of COVID-19 and related stay-at-home orders.

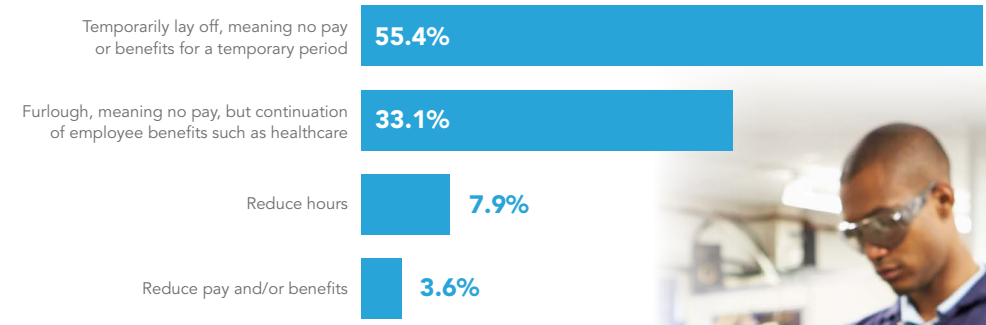
Of these individuals, the majority (55 percent) indicated that they had to temporarily lay off workers, while another third reported that they had to furlough their clean energy employees. Eight percent reported a reduction in hours for their clean energy staff, while roughly four percent indicated reduced pay or benefits during 2020.

Covid-19 Workforce Impacts, 2020

Figure 16

Covid-19 Workforce Impacts, 2020

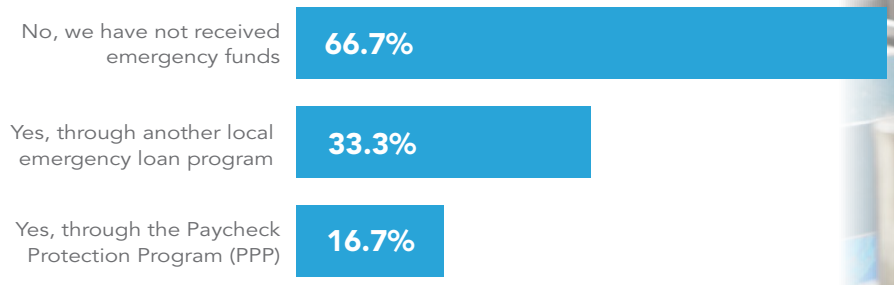
Figure 17



COVID-19 Relief Programs & Assistance, 2020[16]

Figure 18

Two-thirds of Connecticut's surveyed clean energy firms reported that they did not receive emergency funds in 2020. A third of clean energy firms reported that they received assistance through a local emergency loan program, and 17 percent of clean energy firms reported that they received support through the Paycheck Protection Program.

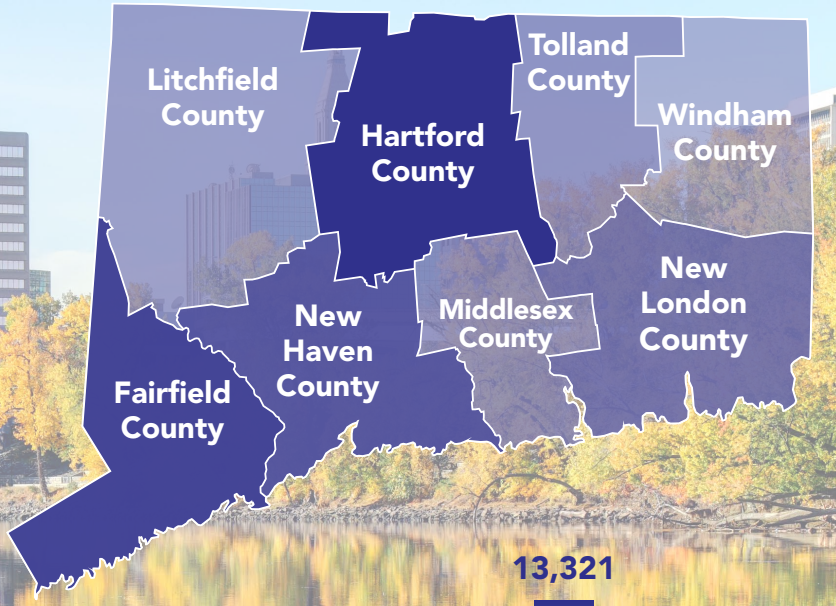


[16] This was a multiple-choice question, and respondents were given the option to select yes for more than one program. However, individuals who selected "no, we have not received emergency funds" were not able to select "yes" for any other response.

The three counties with the highest concentration of clean energy employment shed jobs at a rate of 20 to 32 percent in 2020, resulting in a collective loss of just over 2,000 clean energy jobs across the counties of Hartford, Fairfield, and New Haven.

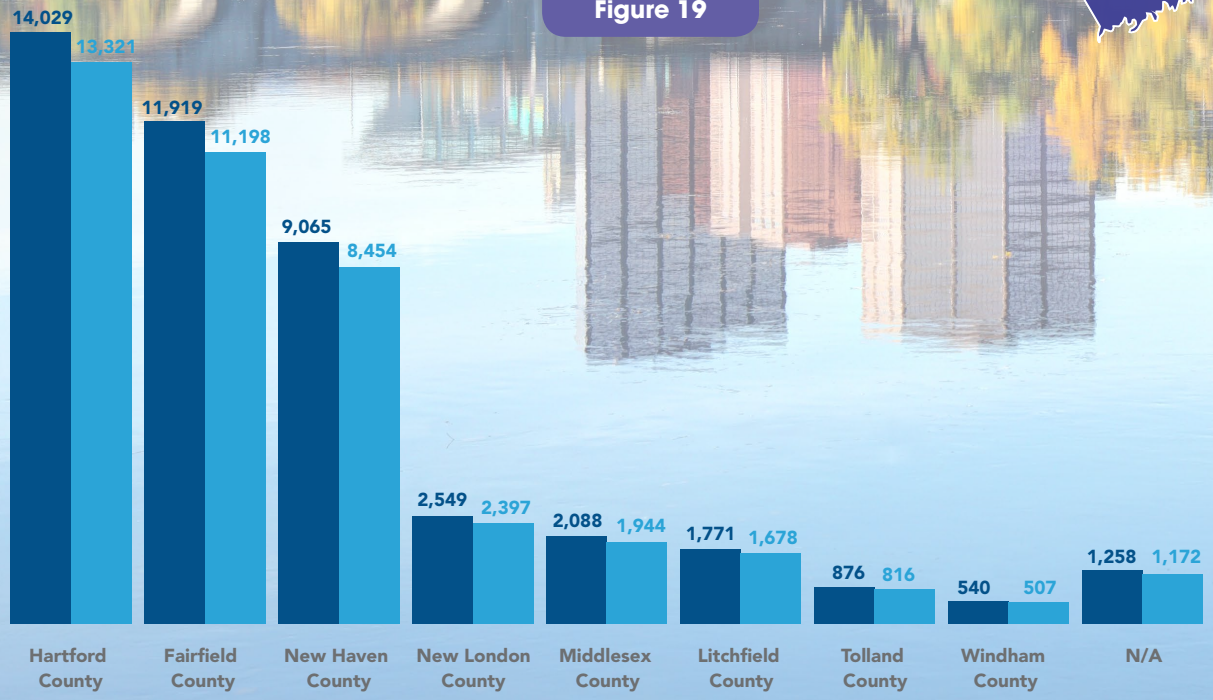
Map Of Clean Energy Employment By County, 2020

Figure 20



Clean Energy Employment By County, 2019-2020[17]

Figure 19



[17] Employment categorized as "n/a" could not be assigned to a single location.

Appendix A: Research Methodology

Data for the 2021 Connecticut Clean Energy Industry Report is taken from the US Energy and Employment Report (USEER). The survey was administered by phone and web. The phone survey was conducted by ReconMR, and the web instrument was programmed internally. Each respondent was required to use a unique ID in order to prevent duplication.

In total, 597 business establishments in Connecticut participated in the survey effort. These responses were used to develop incidence rates among industries 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 +/- 3.99 percent for Connecticut at a 95 percent confidence interval. The full research methodology for USEER may be found at: https://www.usenergyjobs.org/

Appendix B: Clean Energy Technology List

The Connecticut Green Bank, Department of Energy and Environmental Protection, Eversource, and United Illuminating, operating through the Joint Committee, collaborated with BW Research Partnership to develop a clean energy technology definition based on the state's clean energy and climate change policies. Employment in this report is broken out into five major technology sectors and clean energy-specific sub-technologies.

The major clean energy sectors are as follows:

1. Energy Efficiency

2. Clean Energy Generation

3. Alternative Transportation

4. Clean Grid & Storage

5. Clean Fuels

A clean energy job is defined as any worker who is directly involved with the research, development, production, manufacture, distribution, sales, implementation, installation, or repair of components, goods, or services related to the sectors described above. These jobs also include supporting services such as consulting, finance, tax, and legal services related to energy.

Included in these sectors for Connecticut are the following clean energy sub-technologies. The sub-technologies below were selected based on their compliance with clean energy-specific policies across the state, such as the Renewable Portfolio Standard and Zero Emission Vehicle Standard.[18]

CLEAN ENERGY GENERATION

- Solar Photovoltaic Electric Generation
- Concentrated Solar Electric Generation
- Wind Generation
- Geothermal Generation
- Bioenergy/Biomass Generation
- Low-Impact Hydroelectric Generation, including wave/kinetic generation
- Traditional Hydroelectric Generation
- Nuclear Generation
- Combined Heat and Power

CLEAN GRID & STORAGE

Electric Power Transmission and Distribution

- Smart Grid
- Microgrids
- Other Grid Modernization

Storage

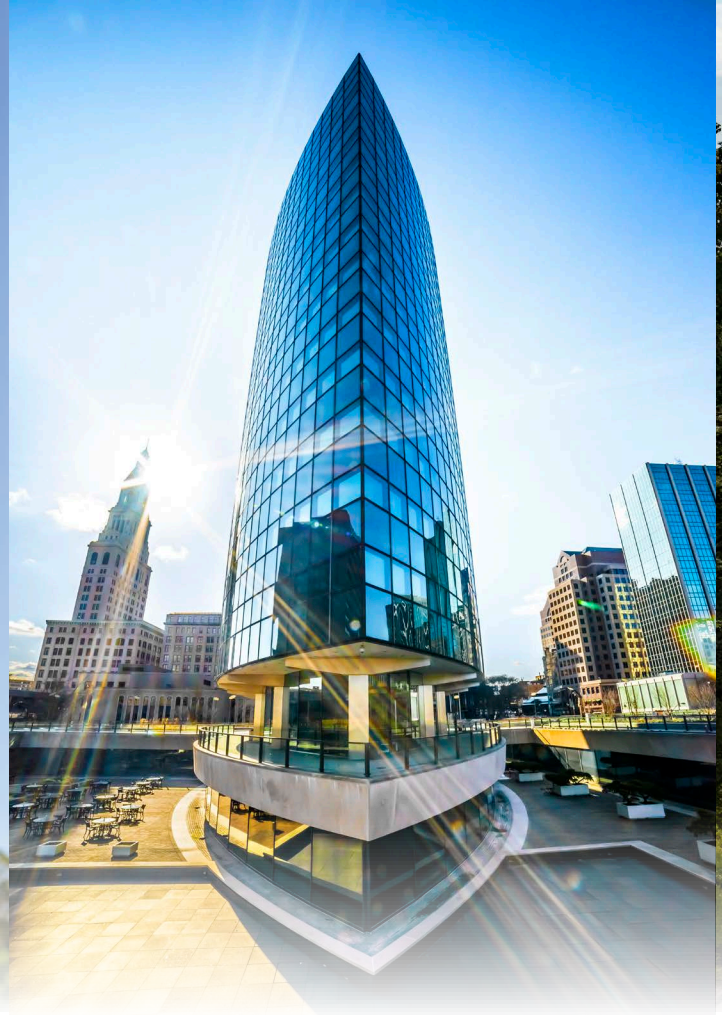
- Pumped Hydropower Storage
- Battery Storage, including battery storage for solar generation
  - – Lithium Batteries
  - – Lead-Based Batteries
  - – Other Solid-Electrode Batteries
  - – Vanadium Redox Flow Batteries
  - – Other Flow Batteries
- Mechanical Storage, including flywheels, compressed air energy storage, etc.
- Thermal Storage
- Biofuels, including ethanol and biodiesel
- Nuclear Fuel

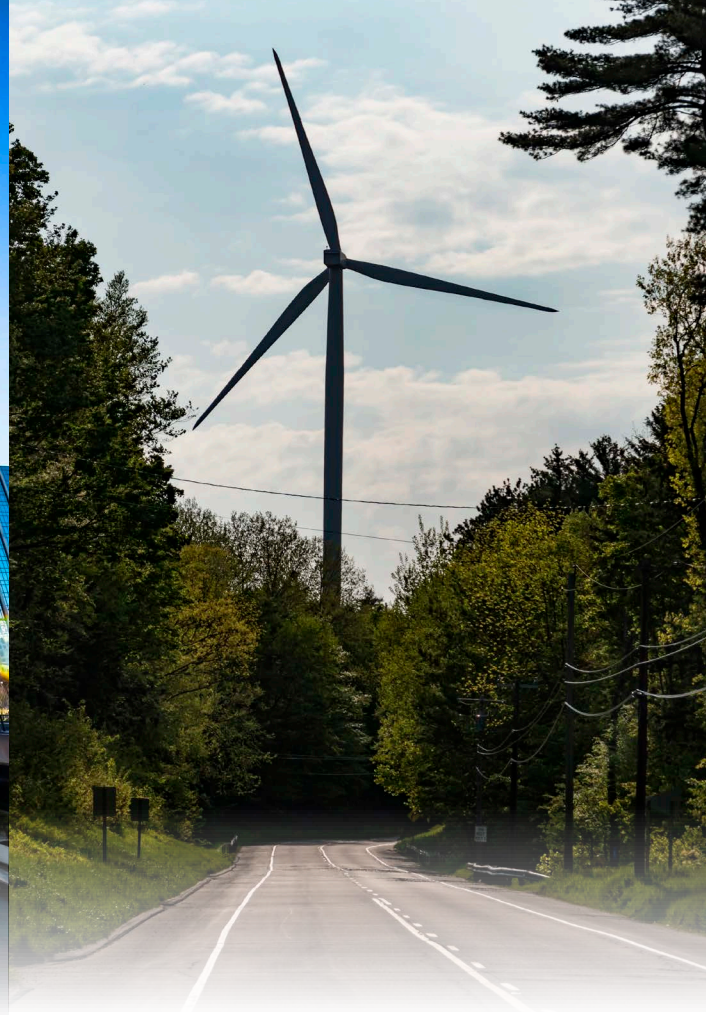
ENERGY EFFICIENCY

- ENERGY STAR Certified Appliances, excluding HVAC
- ENERGY STAR Certified Heating Ventilation and Air Conditioning (HVAC), including boilers and furnaces with an AFUE rating of 90 or greater and air and central air conditioning units of 15 SEER or greater
- Traditional HVAC goods, control systems, and services[19]
- ENERGY STAR Certified Electronics (TVs, Telephones, Audio/Video, etc.)
- ENERGY STAR Certified Windows and Doors
- ENERGY STAR Certified Roofing
- ENERGY STAR Certified Seal and Insulation
- ENERGY STAR Certified Commercial Food Service Equipment
- ENERGY STAR Certified Data Center Equipment
- ENERGY STAR Certified LED Lighting
- Other LED, CFL, and Efficient Lighting
- Solar Thermal Water Heating and Cooling
- Other Renewable Heating and Cooling (geothermal, biomass, heat pumps, etc.)
- Advanced Building Materials/Insulation
- Recycled Building Materials

[18] Including, but not limited to Public Act 08-98, Public Act 11-80, Public Act 17-3, Public Act 18-50, Public Act 18-82, Public Act 19-71, and Executive Order 3.

[19] "Traditional HVAC" workers are those that spend a portion of their time on energy efficient products and services; it is not inclusive of all HVAC workers, only those that are reported to spend less than 50 percent of their labor hours on efficient products and services. "ENERGY STAR/High AFUE HVAC" workers spend the majority of their labor hours (more than 50 percent) working with energy efficient HVAC technologies. The employment data makes this distinction in order to capture all HVAC workers that spend any portion of their labor hours on efficient HVAC technologies, but separates the two job categories in order to appropriately track how much high efficiency HVAC activity is occurring.





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