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Joint Committee of the CT EE Board & CGB Board of Directors

Meeting Date

September 16, 2020

JOINT CGB/EEB COMMITTEE MEMBERS

Eric Brown Chair CT Business & Industry Association	**Michael Li** CT Department of Energy and Environmental Protection (DEEP)
John Harrity Chair CT Roundtable on Climate and Jobs	**John Viglione** Office of Consumer Counsel
Brenda Watson Executive Director Operation Fuel	**Bryan Garcia** President and CEO Connecticut Green Bank
Ronald J. Araujo Eversource	**Bert Hunter** EVP/CIO Finance Connecticut Green Bank
Jane Lano United Illuminating	

AGENDA

Joint Committee of the CT Energy Efficiency Board and the Connecticut Green Bank Board of Directors

Online

September 16, 2020
1:30pm – 2:30pm

1. Call to Order
2. Public Comments (5 min)
3. Review and Approval of Minutes for June 17, 2020 (5 min)
4. Energy Jobs Report – Report Out and Next Steps (15 min)
5. 2021 Conservation & Load Management Plan Update (15 min)
6. Debrief on Legislative (e.g., LCO No. 3920) and Regulatory (e.g., Docket No. 17-12-03) Matters (15 min)
7. Other Business (5 min)
8. Adjourn

Join the meeting online at https://global.gotomeeting.com/join/497927133

Or dial in using your telephone:
Dial: 1 (872) 240-3212 / Access Code: 497-927-133

RESOLUTIONS

Joint Committee of the CT Energy Efficiency Board and the Connecticut Green Bank Board of Directors

Online

September 16, 2020
1:30pm – 2:30pm

1. Call to Order

2. Public Comments (5 min)

3. Review and Approval of Minutes for June 17, 2020 (5 min)

Resolution #1

Motion to approve the meeting minutes of the Joint Committee for June 17, 2020

4. Energy Jobs Report – Report Out and Next Steps (15 min)

5. 2021 Conservation & Load Management Plan Update (15 min)

6. Debrief on Legislative (e.g., LCO No. 3920) and Regulatory (e.g., Docket No. 17-12-03) Matters (15 min)

7. Other Business (5 min)

8. Adjourn

Join the meeting online at https://global.gotomeeting.com/join/497927133

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ANNOUNCEMENTS

- **Mute Microphone** – in order to prevent background noise that disturbs the meeting, if you aren't talking, please mute your microphone or phone.

- **Chat Box** – if you aren't being heard, please use the chat box to raise your hand and ask a question.

- **Recording Meeting** – per Executive Order 7B (i.e., suspension of in-person open meeting requirements), we need to record and post this board meeting.

- **State Your Name** – for those talking, please state your name for the record.

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Joint Committee

Connecticut Energy Efficiency Board and the Connecticut Green Bank Board of Directors

Online
September 16, 2020

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Agenda Item #1

Call to Order

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Agenda Item #2

Public Comments

Welcome Aboard

New Joint Committee Member

John Viglione

Office of Consumer Counsel

(EEB Designee)

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Agenda Item #3

Approval of Meeting Minutes for June 17, 2020

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Agenda Item #4

Energy Jobs Report

Report Out and Next Steps

Modelling “Best Practice”
From Massachusetts to Connecticut

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Clean Energy Industry Report
Next Steps

- **Press Release** – draft a press release for the release of the report – what is the timing of the release? (COVID-19 Survey #2 Webinar – September 24th?)
- **Webinar** – work with [bw] Research Partnerships to see if they would be willing to do a webinar on the report with the Green Bank and EDCs
- **FY 2021 Report** – continue collaboration through Joint Committee with DEEP, EDCs and Green Bank to support report for FY 2021 with [bw] Research Partnerships
- Other Ideas?

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Agenda Item #5

2021 Conservation and Load Management Plan Update of the 2019-2021 Plan

2019-2021 Plan priorities

1. Advance state energy & environmental policy goals
2. Offer tailored solutions for market segments while ensuring equitable distribution
3. Focus on direct savings to customers
4. Develop and maintain a sustainable workforce
5. Continuous commitment to deliver comprehensive energy efficiency strategies
6. Implement effective demand reduction strategies
7. Continue to explore and implement financing options

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2021 Plan Update – Key Items

- Overview of response to COVID-19
  - Increased incentives, virtual pre-assessments, contractor payments, and online workforce trainings
- Continued/increased focus on equitable distribution across all market segments
  - C&I - Serve disadvantaged communities through enhanced incentives and increased Main Street/community outreach efforts
  - Residential - Targeted marketing to reach disadvantaged communities or customer populations (e.g. distressed cities, hardship customers etc.)
- Reviewing / researching code attribution and compliance savings
- Gas DR Pilot (UI)

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2021 Revenue / Budget & LT Savings - Summary

- Revenues / Budgets
  - Electric - $188.0M
  - Natural Gas - $53.5M
- LT Savings
  - Electric – 2.0 Billion kWh
  - Natural Gas – 81.1 Million ccf

2021 budgets are pretty consistent with the 3/1/20 filing; However, the savings are reduced based on higher incentive level assumptions into 2021 combined with program changes to retail lighting products. Changes to the PSD were incorporated.

Appendix

- Electric Revenues
- Natural Gas Revenues
- Budgets

Electric revenues and funding for 2020-2023 program years

ES CT Electric/ UI EE REVENUES	2020 Eversource CT Electric Revenues 03/01/2020	2020 UI Revenues 03/01/2020	2020 Eversource CT Electric/UI Total 3/1/2020	2021 Eversource CT Electric Revenues 11/01/2020	2021 UI Revenues 11/01/2020	2021 Eversource CT Electric/UI Total 11/1/2020
Collections (Mill Rate)	$ -	$ -	$ -	$ -	$ -	$ -
ISO-NE FCM Revenues	$ 28,061,782	$ 6,227,061	$ 34,288,843	$ 27,207,761	$ 5,769,761	$ 32,977,522
Class III Renewable Energy Credits	$ -	$ -	$ -	$ -	$ -	$ -
RGGI*	$ 10,241,112	$ 2,560,278	$ 12,801,390	$ 10,591,031	$ 2,647,758	$ 13,238,789
CAM (Net of Gross Receipts Tax)	$ 113,984,666	$27,350,130	$ 141,334,796	$114,964,678	$26,834,619	$141,799,297
Prior Period Over/(Under) Collections	$ 7,644,871	$ 4,285,087	$ 11,929,958	$ -	$ -	$ -
Prior Period Under/(Over) Budget	$ 9,618,672	$ 1,652,971	$ 11,271,643	$ -	$ -	$ -
Estimated Interest Due to Company/Other Revenues**	$ -	$ 222,245	$ 222,245	$ -	$ -	$ -
Total - EE Revenues	**$ 169,551,103**	**$42,297,773**	**$ 211,848,876**	**$152,763,470**	**$35,252,137**	**$188,015,607**

ES CT Electric/ UI EE REVENUES	2022 Eversource CT Electric Revenues 11/01/2020	2022 UI Revenues 11/01/2020	2022 Eversource CT Electric/UI Total 11/1/2020	2023 Eversource CT Electric Revenues 11/01/2020	2023 UI Revenues 11/01/2020	2023 Eversource CT Electric/UI Total 11/1/2020
ISO-NE FCM Revenues	$ 24,031,370	$ 4,918,613	$ 28,949,983	$ 13,922,152	$ 3,166,813	$ 17,088,965
RGGI*	$ 10,802,851	$ 2,700,713	$ 13,503,564	$ 11,018,908	$ 2,754,727	$ 13,773,635
CAM (Net of Gross Receipts Tax)	$ 113,620,919	$26,487,209	$ 140,108,128	$112,717,000	$26,190,229	$138,907,229
Total - EE Revenues	**$ 148,455,140**	**$34,106,534**	**$ 182,561,674**	**$137,658,060**	**$32,111,770**	**$169,769,830**

*RGGI Budget is based on calculation by the Companies and DEEP. EE FCM Payment Rates are: FCA-10-$7.03/kW-month, FCA-11-$5.30/kW-month, FCA-12-$4.63/kW-month, FCA-13-$3.80/kW-month, and FCA-14-$2.01/kW-month.

Natural gas revenues and funding for 2020-2023 program years

Natural Gas EE Revenues	2020 Eversource CT Gas Revenues 03/01/2020	2020 CNG Revenues 03/01/2020	2020 SCG Revenues 3/1/2020	2020 Combined Eversource CT Gas/CNG/SCG Total	2021 Eversource CT Gas Revenues 11/01/2020	2021 CNG Revenues 11/01/2020	2021 SCG Revenues 11/1/2020	2021 Combined Eversource CT Gas/CNG/SCG Total
CAM	$ 23,458,340	$ 16,156,851	$ 14,450,613	$ 54,065,804	$23,419,728	$15,830,981	$14,215,551	$ 53,466,261
Prior Period Over/(Under) Collections	$ (884,020)	$ (469,530)	$ (278,081)	$ (1,631,631)	$ -	$ -	$ -	$ -
Prior Period Under/(Over) Budget	$ 250,741	$ 2,073,351	$ 2,905,328	$ 5,229,420	$ -	$ -	$ -	$ -
Estimated Interest Due to Company/Other Revenues	$ -	$ 189,328	$ 222,140	$ 411,468	$ -	$ -	$ -	$ -
Total Revenues	**$ 22,825,061**	**$ 17,950,000**	**$ 17,300,000**	**$ 58,075,061**	**$23,419,728**	**$15,830,981**	**$14,215,551**	**$ 53,466,261**

Natural Gas EE Revenues	2022 Eversource CT Gas Revenues 11/01/2020	2022 CNG Revenues 11/01/2020	2022 SCG Revenues 11/1/2020	2022 Combined Eversource CT Gas/CNG/SCG Total	2023 Eversource CT Gas Revenues 11/01/2020	2023 CNG Revenues 11/01/2020	2023 SCG Revenues 11/1/2020	2023 Combined Eversource CT Gas/CNG/SCG Total
CAM	$ 23,570,105	$ 16,322,487	$ 14,498,605	$ 54,391,198	$23,934,809	$16,381,537	$14,692,511	$ 55,008,857
Total Revenues	**$ 23,570,105**	**$ 16,322,487**	**$ 14,498,605**	**$ 54,391,198**	**$23,934,809**	**$16,381,537**	**$14,692,511**	**$ 55,008,857**

All figures are net of GET. All utilities are decoupled.

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Combined program budgets for 2021

Statewide EE BUDGET	2021 Eversource CT Electric Proposed Budget 11/1/2020	2021 UI Proposed Budget 11/1/2020	2021 Eversource CT Gas Proposed Budget 11/1/2020	2021 CNG Proposed Budget 11/1/2020	2021 SCG Proposed Budget 11/1/2020	2021 Statewide Combined Total 11/1/2020
RESIDENTIAL						
Residential Retail Products	$ 6,802,282	$ 1,732,145	$ -	$ -	$ -	$ 8,534,427
Residential New Construction	$ 2,780,422	$ 585,822	$ 965,864	$ 695,351	$ 938,843	$ 5,966,301
Home Energy Solutions - Core Services	$ 19,332,170	$ 3,116,109	$ 2,121,264	$ 2,674,505	$ 1,675,021	$ 28,919,069
Home Energy Solutions - HVAC, Water Heaters	$ 7,298,609	$ 1,831,255	$ 3,369,117	$ 2,183,656	$ 3,061,480	$ 17,744,117
HES-Income Eligible	$ 15,993,930	$ 4,165,466	$ 4,126,723	$ 4,034,660	$ 3,005,535	$ 31,326,314
Residential Behavior	$ -	$ 359,919	$ -	$ 152,867	$ 155,587	$ 668,373
Subtotal: Residential EE Programs	**$ 52,207,413**	**$ 11,790,716**	**$ 10,582,968**	**$ 9,741,040**	**$ 8,836,465**	**$ 93,158,602**
COMMERCIAL & INDUSTRIAL						
C&I LOST OPPORTUNITY						
Energy Conscious Blueprint	$ 12,375,293	$ 4,028,882	$ 4,575,774	$ 2,070,499	$ 1,696,799	$ 24,747,247
Total - Lost Opportunity	**$ 12,375,293**	**$ 4,028,882**	**$ 4,575,774**	**$ 2,070,499**	**$ 1,696,799**	**$ 24,747,247**
C&I LARGE RETROFIT						
Energy Opportunities	$ 38,033,817	$ 7,318,021	$ 4,265,710	$ 1,178,946	$ 1,114,843	$ 51,911,336
Business & Energy Sustainability (O&M, RCx, BSC, PRIME, CSP/SEM)	$ 3,550,274	$ 1,111,034	$ 710,087	$ 682,336	$ 498,026	$ 6,551,756
Total - C&I Large Retrofit	**$ 41,584,090**	**$ 8,429,055**	**$ 4,975,796**	**$ 1,861,282**	**$ 1,612,869**	**$ 58,463,093**
Small Business	$ 16,292,992	$ 3,657,714	$ 929,583	$ 318,879	$ 244,698	$ 21,443,866
Subtotal: C&I EE Programs	**$ 70,252,376**	**$ 16,115,651**	**$ 10,481,153**	**$ 4,250,660**	**$ 3,554,366**	**$ 104,654,205**
OTHER - EDUCATION & ENGAGEMENT						
Educate the Public	$ 656,574	$ 327,634	$ 73,642	$ 76,089	$ 76,089	$ 1,210,028
Customer Engagement	$ 1,968,000	$ 275,000	$ 282,000	$ 100,000	$ 100,000	$ 2,725,000
Educate the Students	$ 412,236	$ 102,752	$ 45,164	$ 45,164	$ 45,164	$ 650,480
Educate the Workforce	$ 790,423	$ 141,467	$ 36,774	$ 67,473	$ 67,473	$ 1,103,609
Subtotal: Education & Engagement	**$ 3,827,233**	**$ 846,852**	**$ 437,581**	**$ 288,726**	**$ 288,726**	**$ 5,689,118**
Subtotal: Programs/Requirements	**$ 3,563,638**	**$ 387,049**	**$ 228,428**	**$ 156,292**	**$ 211,292**	**$ 4,546,699**
Subtotal: Load Management	**$ 9,900,000**	**$ 2,952,331**	**$ -**	**$ -**	**$ -**	**$ 12,852,331**
Subtotal: Admin/Planning Expenditures	**$ 13,012,810**	**$ 3,159,539**	**$ 1,689,598**	**$ 1,394,264**	**$ 1,324,702**	**$ 20,580,912**
TOTAL	**$ 152,763,470**	**$ 35,252,137**	**$ 23,419,728**	**$ 15,830,981**	**$ 14,215,551**	**$ 241,481,868**

Green Bank Support of the Conservation & Load Management Plan

- **Residential Single Family** – require HES and HES-IE for RSIP (i.e., 90% of RSIP projects receive HES or HES-IE), Smart-E Loan (including Health & Safety and current special offer for RH&C, EV, and battery storage), Solarize Storage proposal (i.e., Docket No. 17-12-03RE03), and Green and Healthy Homes Project
- **Residential Multifamily** – Navigator Pre-Development Loan, LIME Loan (including market rate), C-PACE, EnergizeCT Health & Safety Loan, and Green and Healthy Homes Project
- **Small Business** – provide access to unlimited, lower-cost private capital from financial institutions through SBEA (i.e., Amalgamated Bank) and C-PACE (e.g., Greenworks Lending)
- **Medium to Large Business**– SBEA, C-PACE, and developing BEA program modelled after SBEA
- **Institutional** – expanded SBEA to 7 years and up to $1 MM for municipal and state projects, helping State of Connecticut with its "Lead by Example" implementation, and Solar MAP (in partnership with Sustainable CT)

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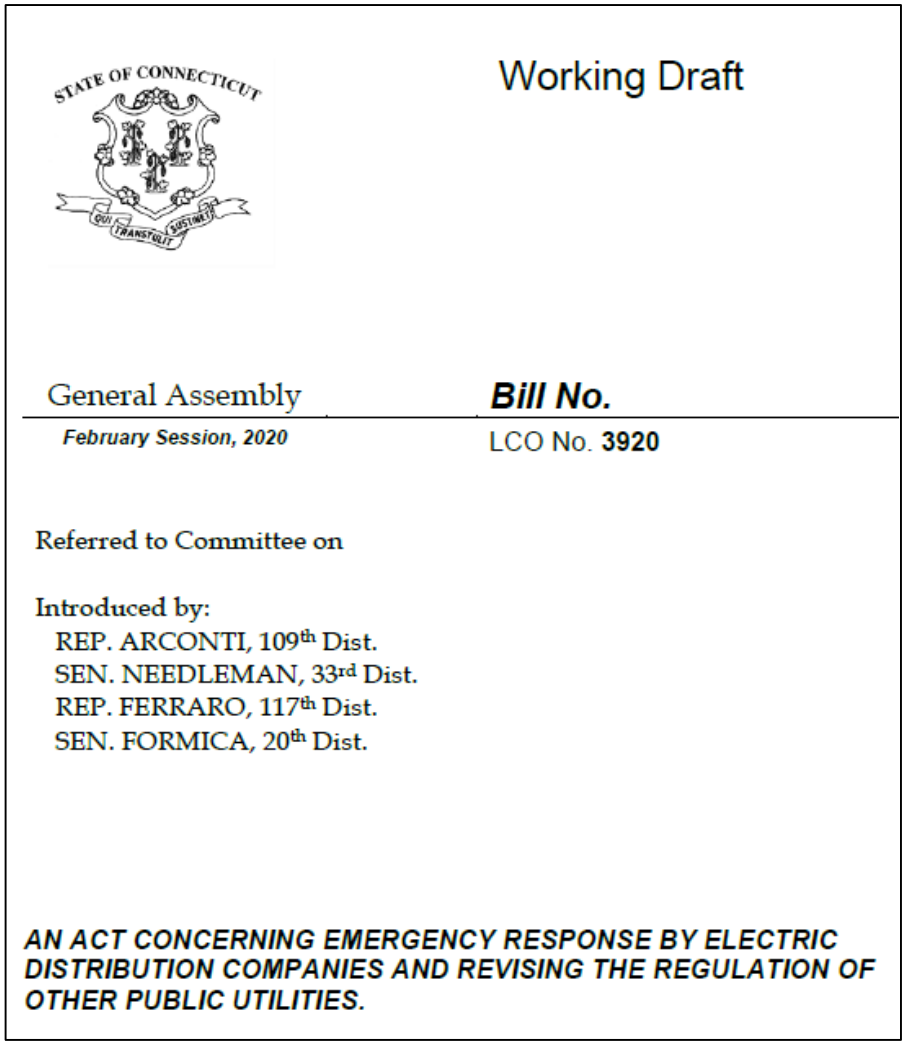
Agenda Item #6

Debrief on Legislative (e.g., LCO No. 3920) and Regulatory (e.g., Docket No. 17-12-03) Matters

Legislative Matters
Proposed LCO No. 3920



Working Draft

General Assembly

Bill No.

February Session, 2020

LCO No. **3920**

Referred to Committee on

Introduced by:

REP. ARCONTI, 109th Dist.
SEN. NEEDLEMAN, 33rd Dist.
REP. FERRARO, 117th Dist.
SEN. FORMICA, 20th Dist.

AN ACT CONCERNING EMERGENCY RESPONSE BY ELECTRIC DISTRIBUTION COMPANIES AND REVISING THE REGULATION OF OTHER PUBLIC UTILITIES.

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Docket No. 17-12-03
Regulatory Matters

#	Reopener
1	Energy Affordability
2	Advanced Metering Infrastructure
3	Electric Storage
4	Zero Emission Vehicles
5	Innovative Technology Application and Programs
6	Interconnection Standards and Practices
7	Non-Wires Alternatives
8	Resiliency and Reliability Standards and Programs
9	DER Analysis and Program Reviews
10	Building Blocks of Resource Adequacy and Clean Energy Supply
11	New Rate Designs

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Green Bank Proposal

Docket No. 17-12-03RE03 – Battery Storage

CONNECTICUT GREEN BANK

vivint.Solar

REEBA
Renewable Energy and Efficiency Business Association, Inc.

AVANGRID

sonnen

PosiGen
Solar Energy and Energy Efficiency

SOLAR Connecticut
Connecticut's Solar Business Group Since 2004

sunrun

GENERAC

SUNPOWER

Virtual Peaker

Guidehouse

EnergyHub

EVERSOURCE ENERGY

Panasonic

Yale University
LUX ET VERITAS

And others…

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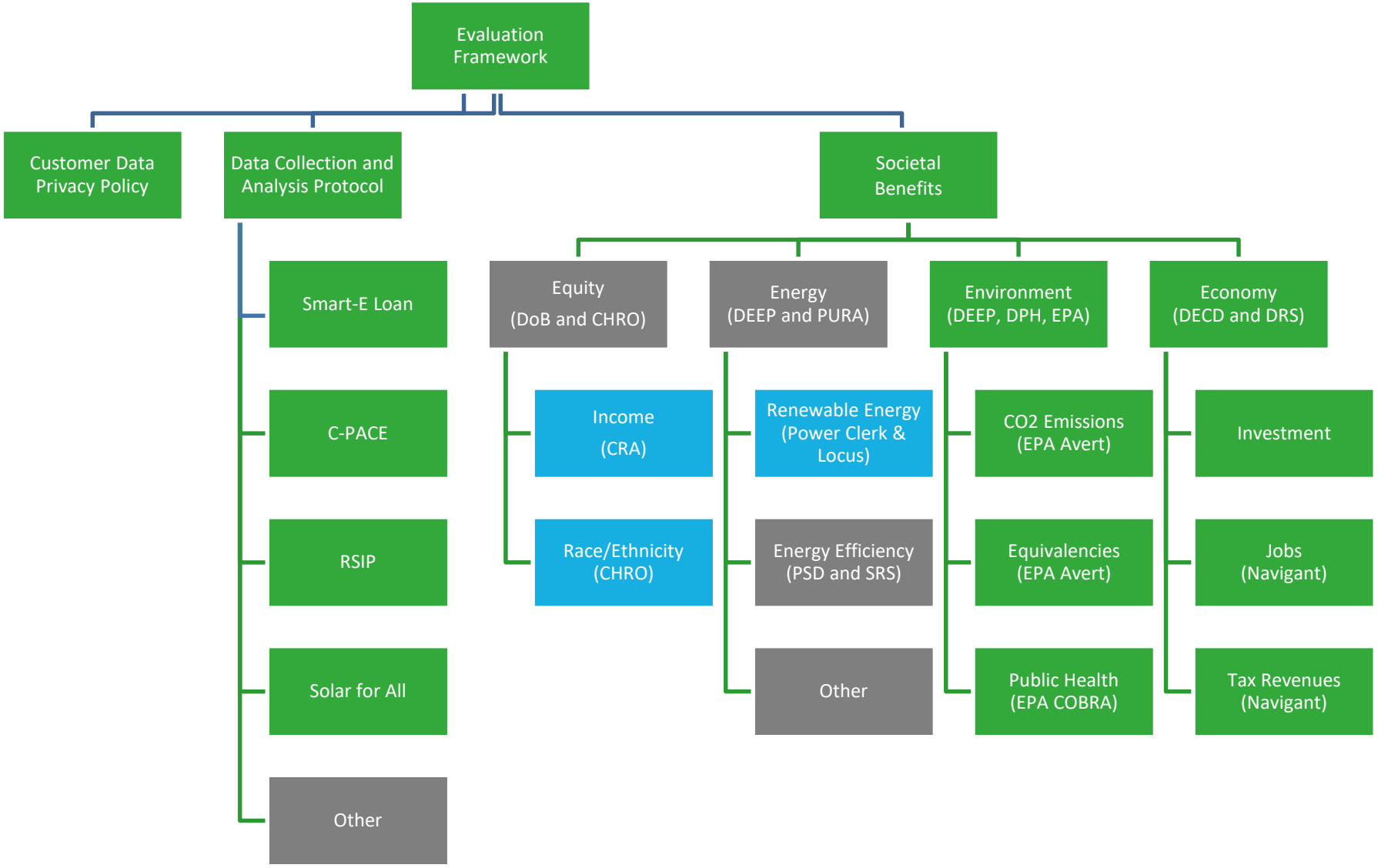
Agenda Item #7

Other Business

Evaluation Framework

"Big Picture" of E^4 Architecture



Equity Metrics

Concept Applied to Affordability Gaps

REFERENCES

Mapping Household Energy & Transportation Affordability in Connecticut study by VEIC as research for the Connecticut Green Bank (forthcoming)

Equity Metrics – Income
In Development

- **Income** – working with the Department of Banking (DoB) to establish income classifications around the Community Reinvestment Act to encourage depository institutions to increase lending to low-to-moderate income communities (i.e., ≤80% of MSA Adjusted Median Income Levels)

Fiscal Year	MSA AMI Band	# of Project Units	% Project Distribution	Installed Capacity (MW)	% MW Distribution	Total Investment	% Investment Distribution	Total Owner Occupied 1-4 Unit Households	% Owner Occupied 1-4 Unit Household Distribution	Project Units / 1,000 Owner Occupied 1-4 Unit Households	Total Investment / Owner Occupied 1-4 Unit Household	Watts / Owner Occupied 1-4 Unit Household
2020	<60%	862	11%	5.6	8%	$20,489,009	9%	62,247	7%	13.8	$329.16	89.3
2020	60%-80%	1,526	19%	11.1	17%	$40,068,857	17%	109,142	13%	14.0	$367.13	101.9
2020	80%-100%	1,824	23%	15.0	23%	$53,681,079	23%	145,988	17%	12.5	$367.71	102.5
2020	100%-120%	1,578	20%	13.6	21%	$48,358,598	21%	204,880	24%	7.7	$236.03	66.4
2020	>120%	2,131	27%	21.0	32%	$72,907,817	31%	343,989	40%	6.2	$211.95	61.1
2020	**Total**	**7,921**	**100%**	**66.3**	**100%**	**$235,505,360**	**100%**	**866,246**	**100%**	**9.1**	**$271.87**	**76.5**
Total	<60%	3,864	9%	25.1	8%	$96,182,706	8%	62,247	7%	62.1	$1,545.18	403.3
Total	60%-80%	7,125	17%	51.0	15%	$191,698,606	15%	109,142	13%	65.3	$1,756.41	467.3
Total	80%-100%	9,547	23%	74.5	22%	$285,157,217	22%	145,988	17%	65.4	$1,953.29	510.3
Total	100%-120%	9,055	22%	73.8	22%	$285,042,847	22%	204,880	24%	44.2	$1,391.27	360.3
Total	>120%	11,932	29%	107.3	32%	$409,835,298	32%	343,989	40%	34.7	$1,191.42	311.8
Total	**Total**	**41,523**	**100%**	**331.7**	**100%**	**$1,267,916,674**	**100%**	**866,246**	**100%**	**47.9**	**$1,463.69**	**382.9**

REFERENCES

Residential Solar Investment Program Performance from FY 2020 Comprehensive Annual Financial Report of the Connecticut Green Bank (forthcoming in November 2020)

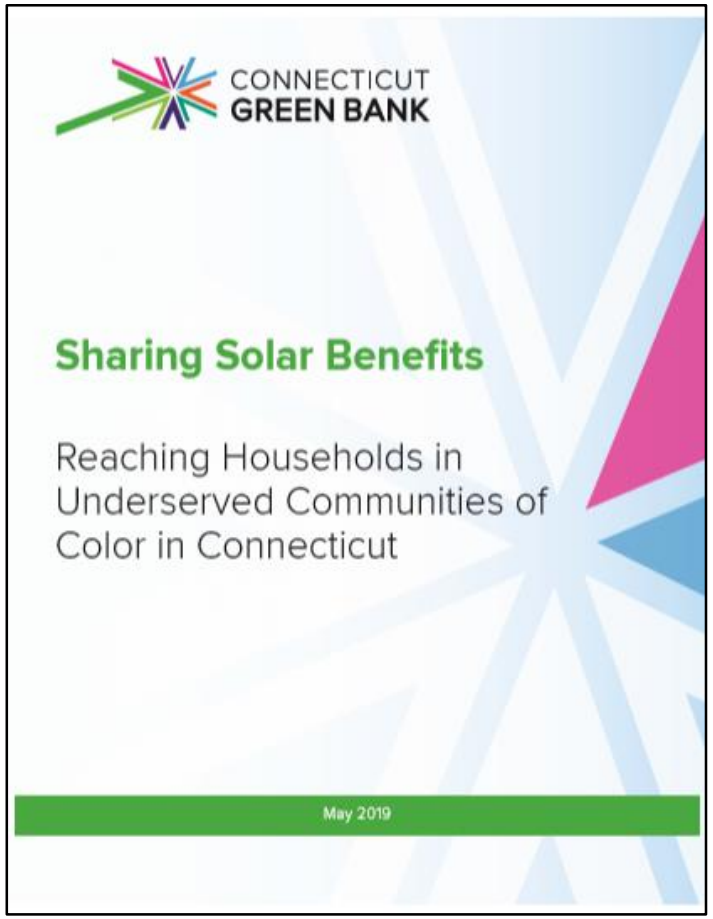
Equity Metrics – Race
In Development

- **Race** – working with the Commission on Human Rights and Opportunities (CHRO) to support classifications around income (i.e., CRA) and race

	Number of Census Tracts	Total Population	Percent of Population
Majority Hispanic	51	280,795	7.8%
Majority Black	24	111,390	3.1%
Majority White	558	2,669,635	74.4%
No Majority Race	200	526,750	14.7%
Grand Total	**833**	**3,588,570**	**100%**

	Number of Owner-Occupied 1-4 Unit Homes	Percent of all Owner-Occupied 1-4 Unit Homes
Majority Hispanic	31,152	3.6%
Majority Black	18,163	2.1%
Majority White	731,901	85.3%
No Majority Race	76,878	9.0%
Grand Total	**858,094**	**100%**

	Percent of 1-4 Unit Owner-Occupied Homes	Percent of RSIP Projects
Majority Hispanic	3.6%	4.1%
Majority Black	2.1%	3.8%
Majority White	85.3%	81.8%
No Majority Race	9.0%	10.3%
Grand Total	**100.0%**	**100%**



REFERENCES
Sharing Solar Benefits: reaching Households in Underserved Communities of Color in Connecticut (May 2019)

2020 Joint Committee Schedule

- **March 18, 2020** – at DEEP in Hartford from 1:30-3:30 p.m. [from April]
- **June 17, 2020** – at Eversource in Berlin from 1:30-3:30 [from July]
- **September 16, 2020** – at Connecticut Green Bank in Rocky Hill from 1:30-3:30 [from October]
- **December 16, 2020** – at United Illuminating in Orange from 1:30-3:30 [from January]

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Agenda Item #8

Adjourn

Draft MINUTES

Joint Committee of the CT Energy Efficiency Board and the Connecticut Green Bank Board of Directors

Wednesday, June 17, 2020
1:30-3:30 p.m.

Due to COVID-19, all participants joined via the conference call.

In Attendance

Voting Members: Eric Brown, Michael Li, Lonnie Reed, Brenda Watson

Non-Voting Members: Stephen Bruno, Bryan Garcia, Bert Hunter, Donna Wells, John Viglione (pending voting member)

Others: Ron Araujo, Gentiana Darragjati, Craig Diamond, Brian Farnen, Ricardo Jordan, Russell King, Liz Murphy, Madeline Priest, Glenn Reed, Cheryl Samuels, Ariel Schneider, Kim Stevenson, Brendan Thomas, Nicholas Zuba

Unnamed Callers: 01, 02, 08, 09

1. Call to Order

   Eric Brown called the meeting to order at 1:36 pm.

2. Public Comments

   No public comments.

3. Review and approval of Meeting Minutes from the December 18, 2019 meeting.

Resolution #1

Motion to approve the meeting minutes for December 18, 2019.

Upon a motion made by Mike Li and seconded by Eric Brown, the Joint Committee voted to approve Resolution 1. Brenda Watson and Lonnie Reed abstained, none opposed. Motion approved.

4. COVID-19 Status - Updates

- Bryan Garcia summarized the COVID-19 updates with Liz Murphy and Ron Araujo. A survey was compiled to assess the impact of COVID-19 on the clean energy industry in CT and understand how revitalization and stabilization could occur. It was a 33-question survey with over 150 responses, of which over 90% were small businesses.
- Bryan Garcia reviewed the response data regarding business impact. It is clear that the clean energy industry faired worse than small businesses in general. For the time-to-recover once stay-at-home orders are lifted, most clean energy industry businesses will take 6-12 months which is longer than most other small businesses. As well, many businesses have noticed the demand has drastically decreased.
- Overall, communication has begun to businesses on how to attain federal assistance, how to access PPE, increase customer demand, and handle project delays. The Green Bank is continuously messaging clean energy contractors. Due to decrease in demand, extensions are being sought through PURA for ZREC, LREC, and SCEF timetables. Smart-E is launching an Interest Rate Buydown to also help support recovery efforts.
- Ron Araujo said HES is working across multiple states to pool resources to help the contracting community. HES business resumed with new guidelines adopted to allow contractors to work outside so that minimal time spent in living spaces would occur. They also hosted self-certification training and virtual pre-assessment training so that HES assessments could occur without going into homes. On June 11th, extra training and certifications were initiated so that vendors can conduct work under the "new normal" conditions. HES also increased incentive levels for insulation which was proposed to DEEP. The typical customer would receive insulation at no cost in order to help them after suspension of work, with the intent to help jumpstart business. For heat pumps, incentives were increased for installations. Also made the heat pump pilot more attractive by increasing rebates.
- Liz Murphy reviewed the recovery efforts for commercial incentives. SBEA is working with partners in New England to adopt regional energy efficiency health and safety guidelines and return to work strategies. They also rolled out project waivers which covered in-process projects and new projects to help jumpstart business later and hosted a Workforce Training online for vendors. Virtual audits have been offered at no cost to microbusinesses, including providing self-installation energy savings kits. Deferrals of SBEA loans have been offered on customer request to move the start of payment up to 6 months after installation. Project payments plans are being developed by utility companies as well. SBEA continues to support limited time offers to increase customer demand including significantly increased incentives across project groups in order to keep revitalization efforts up.
- Bryan Garcia noted that in the survey, 75% of respondents were owners and presidents of companies, that they were drastically impacted, and so communication has been to support them and help them stay confident and safe in their efforts. There will be a follow-up survey as well to see how impact from the efforts have affected businesses.

5. Energy Jobs Report - Update

- Bryan Garcia summarized the job study analysis, though it was conducted before the COVID-19 pandemic began. Data came from the USEER report. Discussion was had about what to do with the Connecticut state data and it was decided to pursue a more custom state report presentation. Due to COVID-19, the event to present the report couldn't be held as planned, but instead a more overview-based report will be released featuring data highlights and easy to understand visuals to make it

accessible to a wider audience. With the survey BW research conducted, prior to COVID-19 the employment projections were high, but post COVID-19 those projections are down to below pre-2015 numbers. The report also includes variances about the Connecticut "clean energy" definition in comparison to the national "clean energy" definition.

- Bryan Garcia reviewed an example of the worksheet made in collaboration with DOL-OWC per sections 19 and 20 of Public Act 19-35. The goal is to link the report to the career ladder worksheets to build a connection to the public policy.
- The report is slated to be done by the end of June. Added to the scope of work is the inclusion of the monthly memos about COVID-19 impacts, a couple more years of data to get 5 years total, and additional career profiles. However, what is needed is the completion of the letter from the Chair of the Joint Committee, Eric Brown, as well as other items including support staff's help make the final decisions for the report for a more rounded and collaborative product.
    - Steve Bruno asked if Bryan Garcia was satisfied with the numbers on the figure sample. Bryan responded yes, and there is more information within the report. There is steady progress being made to build the industry but impacts of COVID-19 can't be understated, and we need to help the market bounce back as much as possible.
    - Lonnie Reed commended the direction of the report, especially in developing narratives which is so important to build connections to understanding. She said she is hopeful this is the kind of report people will keep with them. Bryan Garcia thanked her for her advice and guidance. He believes if the report launch had gone on time, it would have really boosted support for the clean energy industry. The committee also discussed the importance of diversity and inclusion within the report.

6. C&LM Plan and Green Bank Comprehensive Plan – Reviews and Input

    a. FY21 Green Bank Comprehensive Plan

- Eric Brown discussed challenges between each group's reporting timeline variances and the effort to pull them together to be better aligned. Bryan Garcia talked about the efforts to look at different strategic planning cycles between the Green Bank and the Conservation and Load Management Plan to see how to better align those cycles. While the C&LMP acts on 3-year cycle and the Green Bank on 2-year cycle, efforts have been made to overlap more and set better meeting dates to encourage everyone to be knowledgeable about the plans within those individual cycles to increase collaboration efforts. Stephen Bruno said the new schedule looks good for the C&LMP timeline. Glenn Reed agreed.
- Bryan Garcia reviewed the Green Bank Comprehensive Plan, named Green Bonds US which follows the new bond issuance campaign. May into June is when the Green Bank's Budget, Operations, and Compensation Committee meets to review and approve the budget for the coming fiscal year which includes looking ahead at the revenues, targets, and expenses. He then summarized the changes to the new Comprehensive Plan.
    - The Green Bank's FY21 targets are presented at a range this year due to instability created by COVID-19 and whether contingency plans for projects will be realized by PURA decision. The targets are not as large as in the past, but that is due to the market and industry uncertainty.

- The Comprehensive Plan is called Green Bonds US to push the equity and inclusion message in tandem with the bonds to be issued. The bond launch date has been pushed due to COVID-19 but Bryan Garcia said it is close, within the next few weeks. Use of proceeds will be put to combat climate change, mitigation of negative change, will be available to everyday citizens, and are certified and verified independently as a climate bond or green bond for consumer protection.

b. CY21 C&LM Plan

- Glenn Reed summarized the C&LMP is working on the third changes as part of the three-year plan. All the tables and data are updated and though much is paired down, it is still a rigorous undertaking. There hasn't been any discussion of having upper and lower bands due to the uncertainty from COVID-19, but those discussions will occur later this year. Traditionally the C&LMP has been on the conservation efforts, but in the last few years there has been more growth in the load management component. One area of interest is the opportunity to increase the electrification uses of heating and hot water. There have been discussions about pursuing it on a limited basis within 2020 as a residential pilot and a possible CMI pilot next year. A broader discussion of the C&LMP as a driver of the electrification plan will take place in the future as well. The hope is the pilot efforts will inform larger efforts. As noted from prior discussions about the work force, in some areas there is an aging workforce and it will become increasingly important to train the next generation of contractors to continue to pursue the installation of efficient systems.
    - Eric Brown asked if there is any foresight into, whether within the next plan or the new three-year plan, any sections that include recommendations that are common to both entities and reflect a partnership in achieving those priorities. Glenn Reed said is it a good idea, and it is possible it could be more fleshed out within the next three-year plan. Stephen Bruno said there are sections that discuss the programs that overlap with energy efficiency but the focus has been on the financing area, so it's possible some areas of the plan may be worthwhile to build together. Bryan Garcia said that typically in the past there have been 5 sections that have been looked at jointly, and that within the past couple of years more progress has been made on specific financing programs like Smart-E Loan and Small Business Energy Advantage, that in the future the Joint Committee could build around those.

7. Plans for the Special Summer 2020 Legislative Session

- Lonnie Reed said there is a lot of uncertainty with future sessions and it will likely have a very narrow focus, on voting and police reform, but anything is possible. Eric Brown said the challenge is that there may be efforts to keep it to non-controversial topics without need for amendments, but the two items Lonnie Reed mentioned are unlikely to be so and it's hard to imagine a session that wouldn't address those. Overall, no one seems to have a solid concept on what the next session will address.

8. Other Business

- The next meeting is September 16, 2020 at 1:30 pm – 3:30 pm. Bryan Garcia noted it will likely be hosted online.

9. Adjourn

    - Eric Brown invited any feedback or commentary on the meeting or any additional questions from participants so that the meeting time is used well.

Upon a motion made by Brenda Watson and seconded by Lonnie Reed, the Joint Committee Meeting adjourned at 2:52 pm.

Respectfully submitted,

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Eric Brown, Chairperson

September
2020

Connecticut Clean Energy Industry Report

energize CONNECTICUT℠

[bw] RESEARCH PARTNERSHIP

The following report details all clean energy-related jobs across the state from 2017 to 2019, specific to the Connecticut definition of clean energy activities. 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. For a detailed list of clean energy sub-technologies for the state of Connecticut, please refer to Appendix A of this report. 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:

- **Energy Efficiency**
- **Clean Energy Generation**
- **Alternative Transportation**
- **Clean Grid & Storage**
- **Clean Fuels**

In addition to jobs data, the report details clean energy employment by value chain segment, clean energy wages and wage premiums, employer hiring difficulties, geographic opportunity zones, and the demographic distribution of clean energy workers compared to state- and nationwide averages. All data presented in this report is based on the 2020 United States Energy and Employment Report (USEER) data collection effort, a joint project of the National Association of State Energy Officials (NASEO) and the Energy Futures Initiative (EFI).[1]

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 Partners

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.

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] www.USEnergyJobs.org

By Eric Brown

This Connecticut Clean Energy Industry Report provides a glimpse into the progress we have been making to build a more vibrant and sustainable clean energy economy in Connecticut. This report, developed in collaboration by Avangrid, Connecticut Green Bank, DEEP, and Eversource through the Joint Committee, highlights how our families, businesses, and our economy benefit from sustained growth in this sector.

During our analysis for this report, our state was hit by a global pandemic that saw "shelter in place" and "social distancing" policies stunting all economic activity. COVID-19 has had a significant detrimental impact on Connecticut's small clean energy businesses. Sales plummeted, construction jobs stalled, and nearly 15 percent of our workforce was unemployed. The leaders of these determined small businesses suggest it could take between six and twelve months for operations to return to pre-pandemic levels. This sudden downturn reminds us of our need to strive for continuous innovation in the leveraging of ratepayer funds to create a more self-sustaining, resilient industry going forward.

Since 2015, Connecticut has made steady progress building its clean energy industry. There are now more than 44,400 clean energy workers employed in over 4,300 companies within Connecticut's $6.5 billion clean energy economy. The sector has seen nearly 10 percent growth since 2015. Over 80 percent of these employees work within the energy efficiency sector installing high efficiency HVAC systems and Energy Star® appliances and equipment. About 10 percent of clean energy employees work in clean energy generation, primarily solar energy and nuclear power. The clean energy workforce consists predominantly of essential construction workers, as well as professional services, trade, manufacturing, utilities, and other services.

Connecticut continues to lead on policy innovation. As the country progresses towards a clean energy future, the Constitution State continues to advance bipartisan-supported public policies that are leading to the deployment of cleaner energy while improving reliability and affordability, reducing the burden of energy costs on families and businesses, modernizing our energy infrastructure for a 21st century clean energy economy, and reducing greenhouse gas emissions. Through EnergizeCT and the partners of the Joint Committee, we are implementing state energy policy through award-winning programs across all sectors and populations of Connecticut with continuous innovation towards greater leveraging of ratepayer funds and a uniformly positive customer experience.

Clean energy is delivering positive impacts on society. In 2019 alone, over $1.2 billion of investment in Connecticut's clean energy economy was mobilized through Energize CT. This investment generated over $75 million in tax revenues to the State of Connecticut through sales tax, individual tax, and corporate tax revenues. This investment in clean energy reached more than 262,000 customers, reducing the burden of energy costs from their homes and buildings, while deploying the equivalent of nearly 150 MW of clean energy from energy efficiency and renewable energy technologies. By deploying more clean energy in our communities, we not only contribute to economic development, but we also improve the environment by avoiding over 250,000 tons of greenhouse gas emissions that cause global climate change and local air pollution from NOx, SOx, and particulate matter that cause public health problems.

Clean energy is improving the lives of our most vulnerable and small businesses. Connecticut has been focused on reducing the percentage of household income spent on energy for our most vulnerable communities through the deployment of clean energy. Through the Home Energy Solutions – Income Eligible Program, we have reduced the energy burden on households through home energy assessments in combination with insulation. Connecticut is known as a "Solar with Justice" state since it is at "parity" when it comes to low-to-moderate income (LMI) families and "beyond parity" when it comes to communities of color (i.e., Black and Hispanic families) demanding solar PV.

Energy costs have an impact on our small businesses as well, which is why through the Small Business Energy Advantage Program, we have reduced energy costs through improved energy efficiency for businesses.
As small businesses begin to reopen from the COVID-19 pandemic, their ability to control costs and reduce usage is even more crucial than before, and the clean energy industry can play an important role during this recovery.

While COVID-19 has impacted our progress, it has not weakened our resolve. Through EnergizeCT, we are committed to building a vibrant, resilient, and growing clean energy industry for Connecticut that can withstand future pandemics, budget pressures or other unforeseen challenges.

2019 Joint Committee Achievements

Invested over **$1.2 billion** in the clean energy industry

Impacted more than **262,000 customers**

Avoided **228,142 tons** of CO2 emissions

31 million tons of NOx, SOx, and PM avoidance

Supported over **39,000** clean energy jobs

Contributed **$6.8 billion** to the gross state product

Economic value of public health contribution surpasses **$6.4 million**

Energy equivalent of **149 power plants** or the energy to power **53,703 homes** for a year

Tax revenue of more than **$76 million generated**

Clean energy jobs make up **2.6%** of all jobs in Connecticut.

For every **10,000** workers in the state, there are 263 clean energy jobs, compared to 238 in the U.S.

Clean energy workers in 2019 totaled **44,094** in Connecticut, showing a **9.1%** increase since 2015.

Clean energy companies accounted for just over **$6.5 billion** of Connecticut's Gross State Product in 2019.

- Clean energy companies across the state have created 3,691 new jobs since 2015, and full-time equivalent clean energy jobs are growing even faster than the overall clean energy labor market.
- Clean energy employment growth accounted for three percent of all new job growth statewide between 2018 and 2019, and the clean energy economy has grown by 9.1 percent in four years.
- Since 2015, full-time equivalent clean energy jobs in Connecticut have grown by 13.9 percent, indicating that employees are spending more of their time on clean energy work in the state.
- Energy efficiency workers represent eight in ten clean energy jobs across the state. This sector has also seen the greatest absolute growth since 2017, creating 1,257 new jobs—a growth rate of 3.6 percent. Within the sector, HVAC and ENERGY STAR® and efficient lighting technologies account for the majority of activity.
- Between 2017 and 2018, solar employment in Connecticut dropped by 2.2 percent, as a result of changing domestic business models for solar and global trade tariffs; however, this decline was less drastic compared to a nationwide job loss of 4.2 percent over the same time period. The solar industry recovered in 2019, mirroring national trends.
- The majority of clean energy jobs pay more than their corresponding occupational average, especially for entry-level workers. In total, just over three-quarters (76.9 percent) of clean energy jobs in Connecticut earn more than the corresponding occupational average across all levels of experience. For entry-level workers in particular, 92 percent of occupations are paid a premium. This means that nine in ten entry-level clean energy workers are making more money compared to their occupational counterparts in non-clean-energy positions.
- Hiring difficulty in Connecticut was lower than the national average.
- Clean energy job growth can support both demographic and geographic pockets of unemployed workers in Connecticut.
- Training program offerings correlate to areas of high unemployment and clean energy job concentration.
- The clean energy economy is a good source of jobs for Veterans but has low representation of ethnic and racial minorities and women.

It is important to note that this report was commissioned before the global Coronavirus (COVID-19) pandemic, which has significantly altered labor market and employment realities across nearly all industries in the United States. The 2020 Connecticut Clean Energy Industry Report is based on data collected in the last quarter of 2019, before the advent of COVID-19 and resulting social distancing and shelter-in-place orders. Due to the shuttering of doors for numerous businesses across the state and nation, employment figures included throughout this report serve as a pre-pandemic baseline of clean energy industry employment in Connecticut. While the full economic impact of the pandemic is yet unknown, BW Research estimates that Connecticut lost 5,664 jobs through June.[2]

	Total Jobs Lost by Month	Cumulative Job Losses
March	(1,037)	(1,037)
April	(5,191)	(6,228)
May	(323)	(6,551)
June	887	(5,664)

In the aftermath of the pandemic-induced recession, Connecticut will have an opportunity to capitalize on the previously strong clean energy job growth. The clean energy industry is likely well-poised to see a more rapid comeback compared to other sectors of the economy. Since many jobs in the clean energy sector can be conducted while maintaining physical distancing and using personal protective equipment (PPE). Furthermore, the clean energy industry in Connecticut is supported by numerous policies and programs that ensure the continued deployment of clean energy technologies, maintaining steady demand that should quickly return as shelter-in-place policies have subsided.

Figure 1. Covid-19 Job Losses By Technology Sector, June 2020

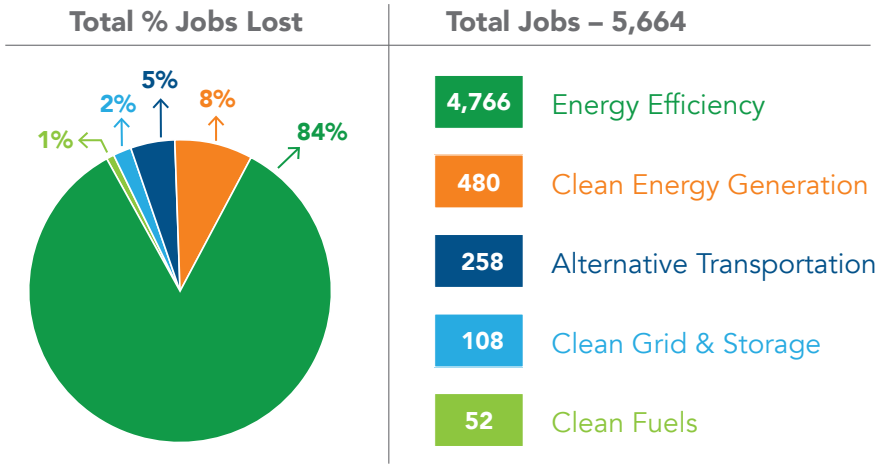


Figure 2. Covid-19 Job Losses By Value Chain Sector, March-June 2020

[2] Further analysis related to the COVID-19 pandemic's economic impacts can be found at http://bwresearch.com/covid19.

In April, the Connecticut Green Bank and the Connecticut Department of Energy and Environmental Protection, in collaboration with the Governor's Office and AdvanceCT, with assistance from Eversource, Connecticut Natural Gas, Southern Connecticut Gas and United Illuminating conducted a survey of Connecticut's clean energy industry to assess the impacts of COVID-19 and to help guide recovery efforts.

Administered from April 14 – 24, the survey garnered 153 total responses. Over 60% of the respondents were small business owners (52%) and executives (9%) with remaining from managers (26%), accounting (5%), and human resources (1%). There were 121 unique clean energy companies represented, with 91% of these companies having less than 50 employees and 48% with fewer than 10 employees.

The negative impact on clean energy industry workers was more pronounced than the average impact across Connecticut job sectors. Higher percentages of clean energy industry employees had their schedules reduced (47.15%), were laid off (32.52%), and were furloughed (31.71%) than the State averages.

"All small business" is based on an analysis of corresponding questions from a survey administered by AdvanceCT from April 17-24, 2020 comprising about 1,800 responses from all Connecticut businesses as a benchmark for comparison.

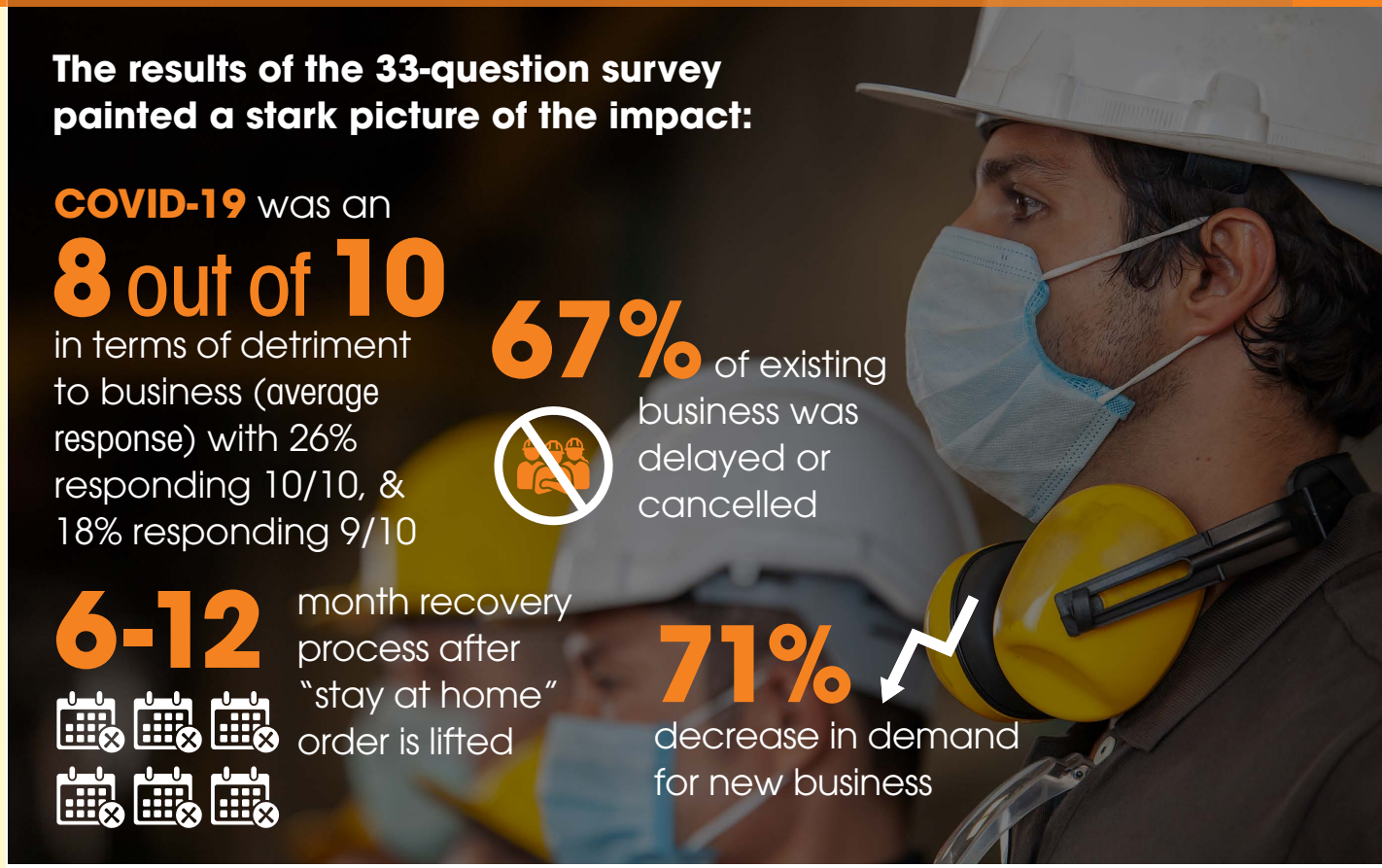
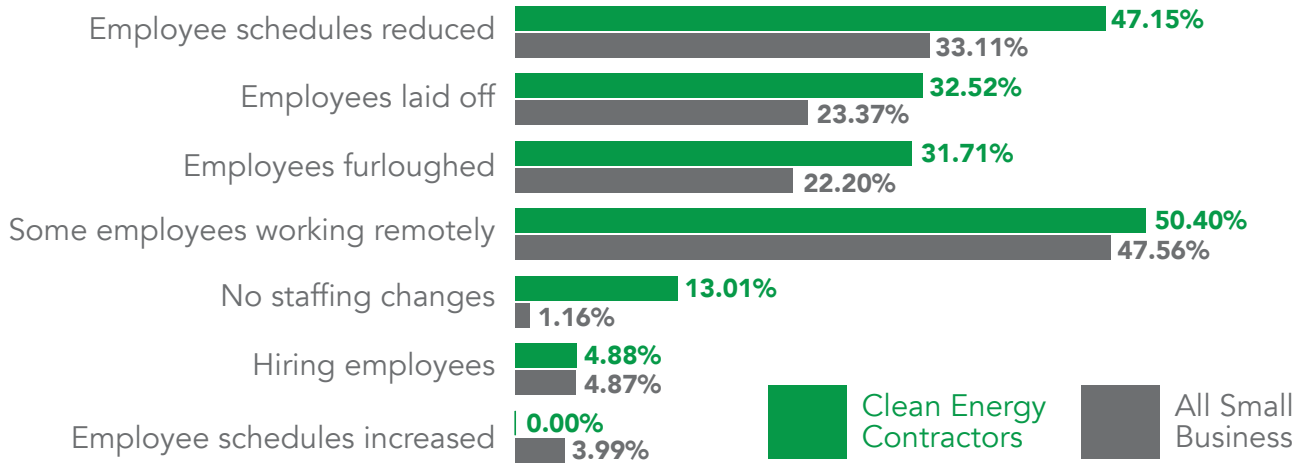


Figure 3. How has your business been impacted by COVID-19 in terms of its employees?



Connecticut Green Bank wins the 2017 Innovations in American Government Award from the Kennedy School of Government at Harvard University.

According to SEIA since 2017, Connecticut has the highest residential installed watts per capita in the Northeast region of the US.

Connecticut Green Bank honored by Environmental Finance for green bond issuance

2019 Awards:

American Council for an Energy-Efficient Economy (ACEEE) has consistently ranked Connecticut as one of the top states for energy efficiency (2017 – 2019)

Energize Connecticut, in partnership with Eversource and AVANGRID, Inc. subsidiaries CNG, SCG and UI, received the ENERGY STAR® Partner of the Year – Sustained Excellence Award in Energy Efficiency Program Delivery in 2017, 2018 and 2019

2018 Awards:

AESP Outstanding Award for residential program delivery

ACEEE Exemplary Award for two programs, small business and multifamily

2017 Awards:

EPA Merit Award for the Second Year in a Row for Portfolio Manager Implementation

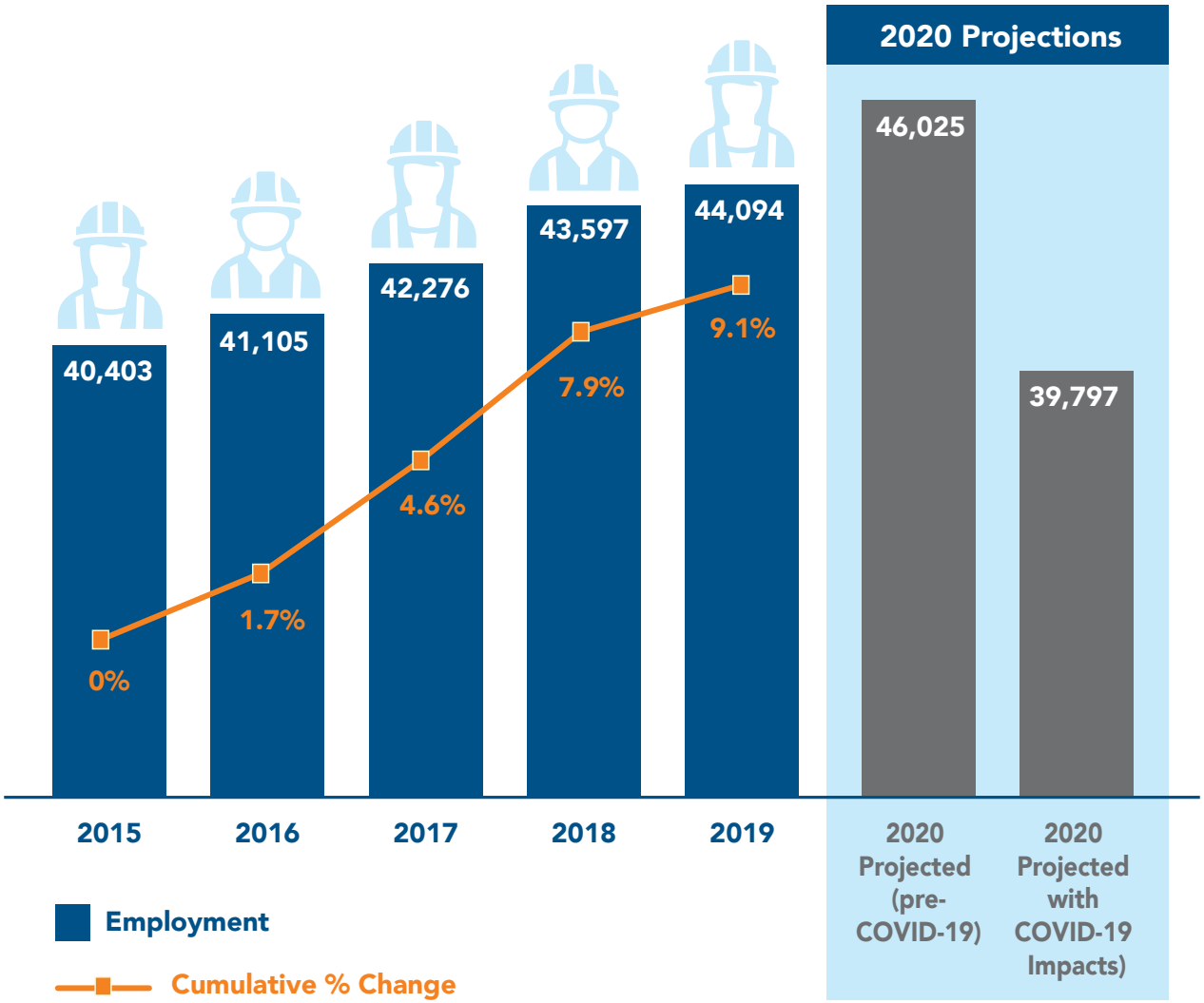
Green Circle Sustainability Award

Energy Star Certified Homes Marker Leader Award

As of the end of 2019, there were just over 44,000 clean energy workers across the state of Connecticut. Clean energy jobs have grown by 9.1 percent since 2015, creating 3,691 new jobs in four years. In total, clean energy jobs accounted for 2.6 percent of all jobs in Connecticut. In fact, while total jobs in Connecticut declined between 2018 and 2019, clean energy jobs continued to grow.[3] In 2019, Connecticut accounted for one percent of all clean energy jobs nationwide.

Connecticut has an above average concentration of clean energy jobs compared to the nation. Clean energy jobs are 10 percent more concentrated in the state compared to the national average. This metric indicates that across Connecticut, clean energy jobs account for a larger-than-average share of total jobs. For every 10,000 workers in Connecticut, there are 263 clean energy jobs while for every 10,000 workers in the United States, there are a total of 238 clean energy jobs.

Figure 4. Clean Energy Employment In Connecticut, 2015-2020 Projected

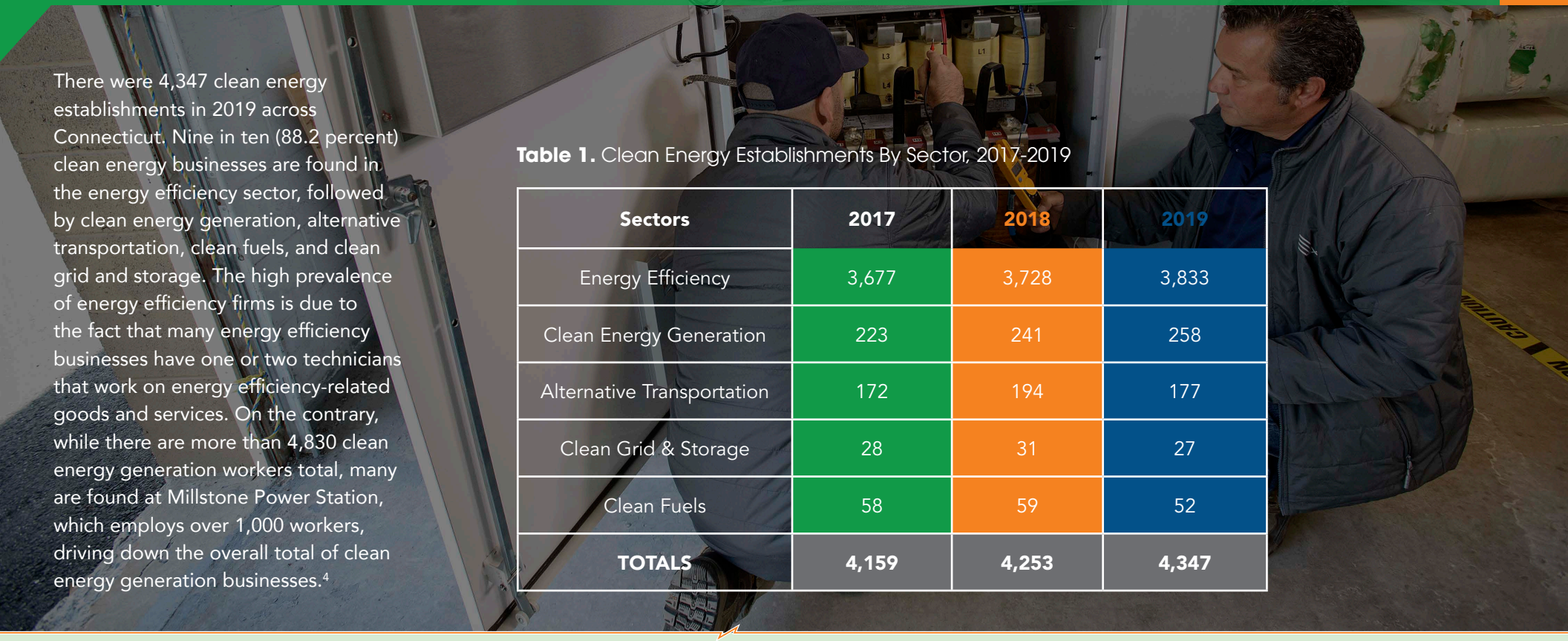


[3] Total employment for Connecticut is from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2018 Annual Average and Q2 2019. Data was extracted on February 10, 2020.

Roughly eight in ten clean energy jobs (81.6 percent) are found in the energy efficiency sector. Energy efficiency jobs total to 36,000 workers across the state and grew by 3.6 percent, or 1,257 jobs, in two years. Following energy efficiency, clean energy generation is the second largest clean energy sector. These businesses employ 4,830 clean energy workers and created 282 jobs since 2017—a growth rate of 6.2 percent.

Alternative transportation firms comprise just over four percent of clean energy jobs in Connecticut. These companies increased employment by 12.2 percent since 2017, creating an additional 203 jobs for a total of 1,865 workers. The clean grid and storage and clean fuels sectors are smaller components of Connecticut's clean energy industry. Together, these two sectors account for 3.2 percent of the clean energy workforce and created 77 new jobs since 2017.

Figure 5. Clean Energy Employment By Sector, 2017-2019



There were 4,347 clean energy establishments in 2019 across Connecticut. Nine in ten (88.2 percent) clean energy businesses are found in the energy efficiency sector, followed by clean energy generation, alternative transportation, clean fuels, and clean grid and storage. The high prevalence of energy efficiency firms is due to the fact that many energy efficiency businesses have one or two technicians that work on energy efficiency-related goods and services. On the contrary, while there are more than 4,830 clean energy generation workers total, many are found at Millstone Power Station, which employs over 1,000 workers, driving down the overall total of clean energy generation businesses.[4]

Table 1. Clean Energy Establishments By Sector, 2017-2019

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

Top Five Fastest Growing Sub-Sectors

Top 5 Highest Growth Sub-Sectors (Absolute Job Growth):
Traditional HVAC (453 new jobs since 2017)
ENERGY STAR® and Efficient Lighting (449 new jobs)
Advanced Materials (244 new jobs)
High Efficiency HVAC and Renewable Heating and Cooling (138 new jobs)
Wind (114 new jobs)

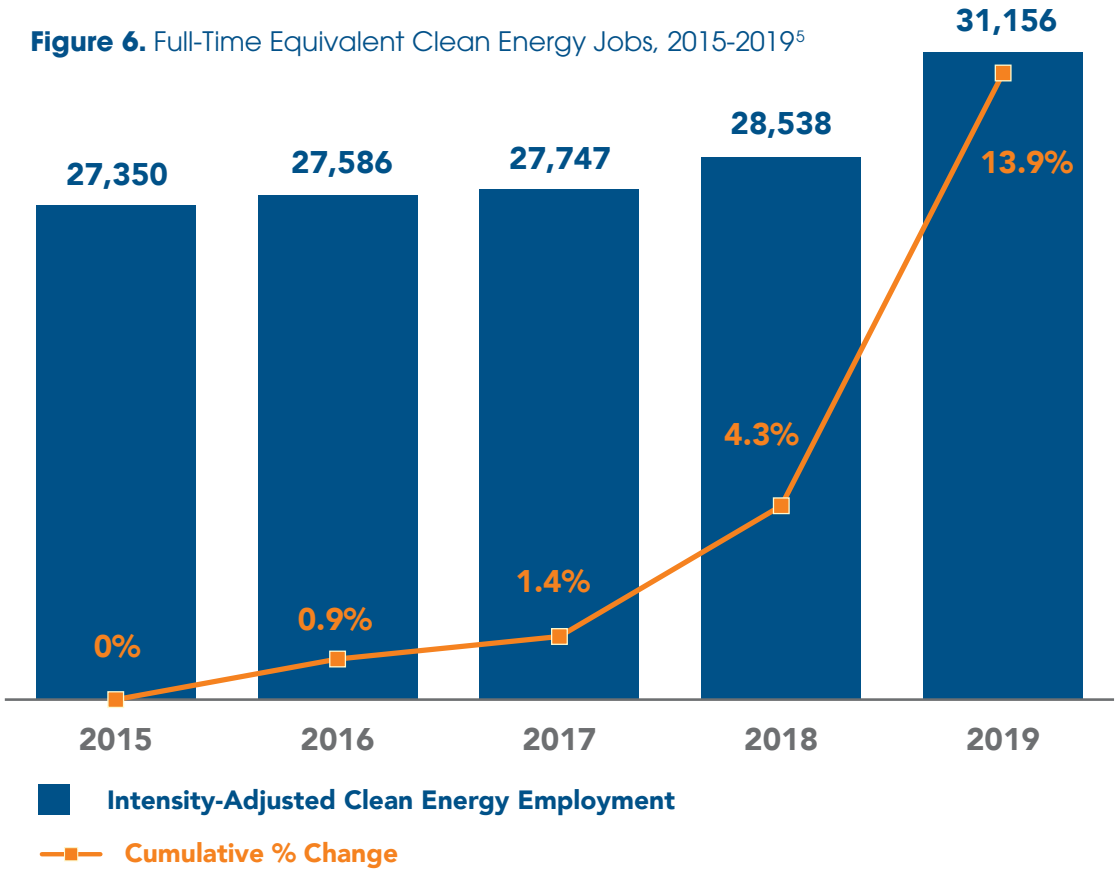
Top 5 Highest Growth Sub-Sectors (Proportional Job Growth):
Other Ethanol and Non-Woody Biomass (254.8 percent growth since 2017)
Wind (158.7 percent growth)
Woody Biomass (114.2 percent growth)
Traditional Hydropower (108.5 percent growth)
Bioenergy and Combined Heat and Power (49.8 percent growth)

[4] https://www.nei.org/CorporateSite/media/filefolder/resources/fact-sheets/state-fact-sheets/Connecticut-State-Fact-Sheet.pdf

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.

Intensity, or concentration, of clean energy work has been on the rise in Connecticut. In fact, full-time equivalent clean energy jobs are growing faster than the overall clean energy labor market. Between 2015 and 2019, the number of full-time equivalent clean energy workers in Connecticut increased by 3,805 jobs, for a growth rate of 13.9 percent in two years. As of the last quarter of 2019 there were 31,156 FTE clean energy jobs in Connecticut. This indicates that employees are spending more of their time on clean energy work in the state.

Figure 6. Full-Time Equivalent Clean Energy Jobs, 2015-2019[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.

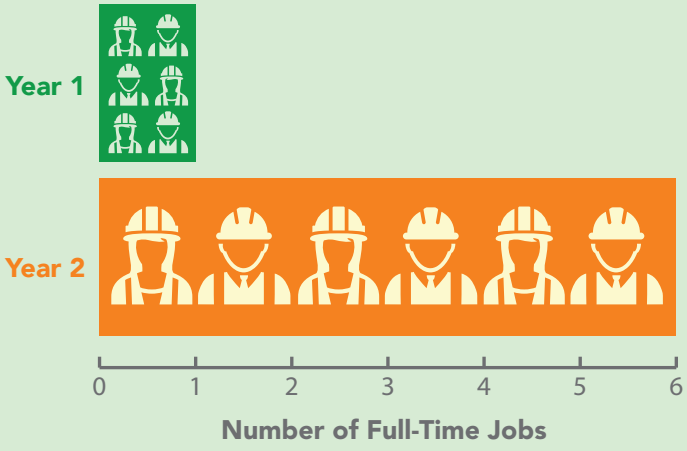


Figure 7. FTE Clean Energy Jobs Explained

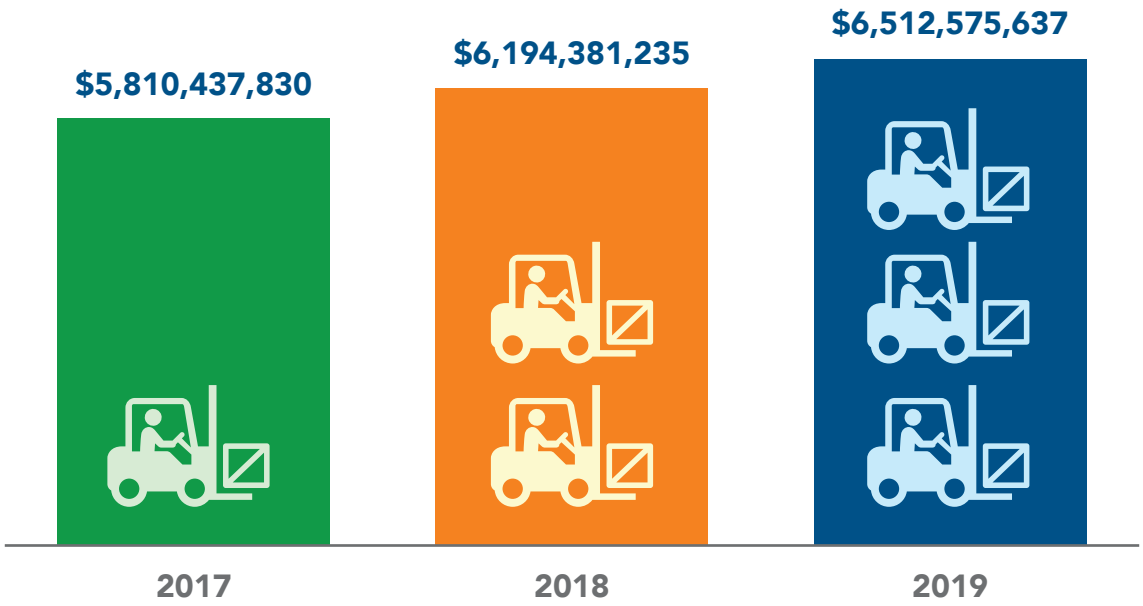
[5] These jobs were extrapolated using a combination of state-level and census region data. The data was adjusted based on revenue distribution by technology and weighted according to how much time workers were reported to spend on clean energy activities (0-49 percent, 50-99 percent, or 100 percent).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

In 2019, clean energy accounted for $6.5 billion of Connecticut's Gross State Product (GSP). This represents a 12 percent increase since 2017. To date, the clean energy industry accounts for 2.6 percent of total gross domestic product in the state.[6]

Table 2. Clean Energy Gross State Product (GRP) By Value Chain, 2019

Value Chain	2019 Clean Energy GSP
Manufacturing	$2,078,550,282
Professional and Business Services	$2,132,314,807
Sales	$527,047,848
Construction	$692,684,480
Utilities	$1,057,284,841
Other Services	$18,662,105
Agriculture	$6,031,270
TOTAL	**$6,512,575,637**

Figure 8. Clean Energy Gross State Product (GSP), 2017-2019



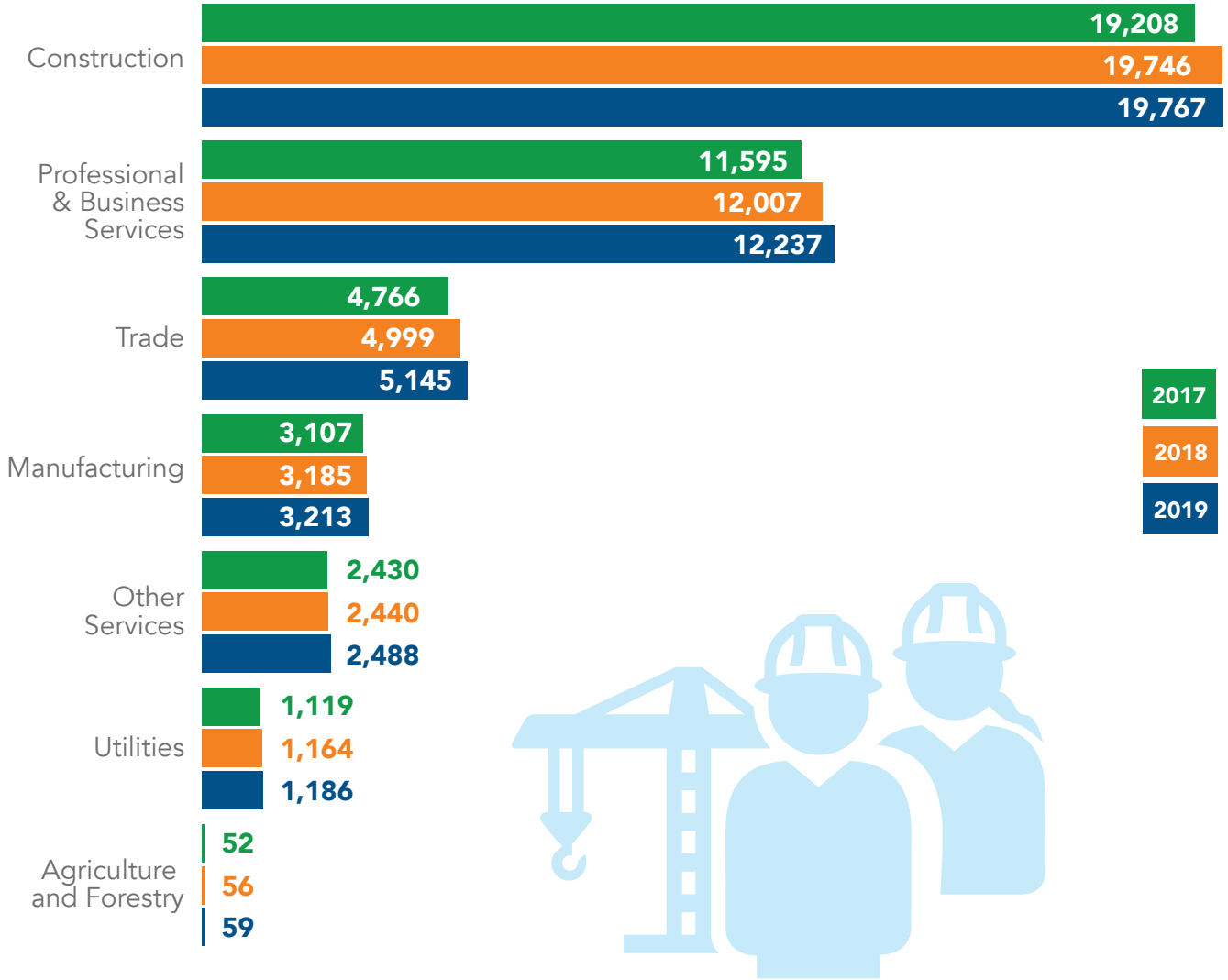
[6] Total Connecticut Gross Domestic Product from Bureau of Economic Analysis (BEA), 2019.

Construction jobs account for just under half of all clean energy jobs in Connecticut (44.8 percent). Between 2017 and 2019, the construction industry grew by 2.9 percent adding 559 jobs to the clean energy labor market.

Connecticut's clean energy economy also includes a significant proportion of professional services, such as engineering, software development, research and design, or finance. These individuals represent about a quarter of all clean energy jobs (27.8 percent). Clean energy professional services grew by 5.5 percent in two years, adding 642 jobs for a total of just over 12,200 workers.

Wholesale trade, manufacturing, utilities, agriculture, and other activities such as non-profit work altogether comprise the remaining 27.4 percent of clean energy jobs. All value chain segments grew between 2017 and 2019.

Figure 9. Clean Energy Employment By Value Chain Segment, 2017-2019



The energy efficiency and clean grid and storage sectors have the majority of employment concentrated in the construction industry; these two sectors have an above-average concentration of construction workers compared to Connecticut's overall clean energy industry average of 45 percent.

Professional service workers are mostly found in the energy efficiency sector, followed by clean grid and storage and clean energy generation.

The 58 percent of workers in "other services" for alternative transportation are focused on automotive repair and maintenance.

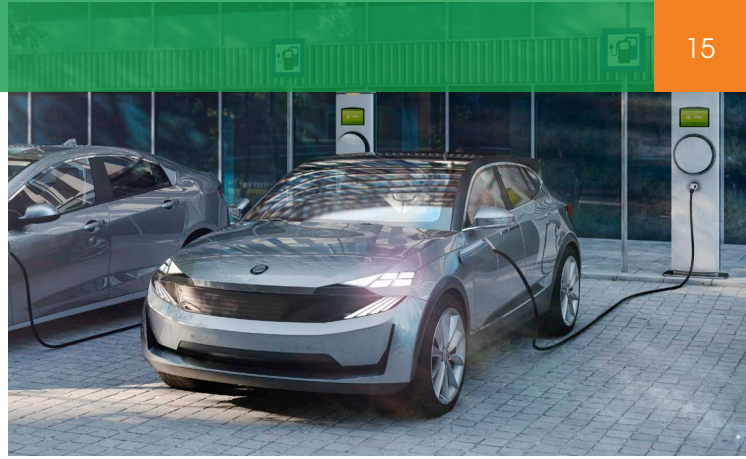
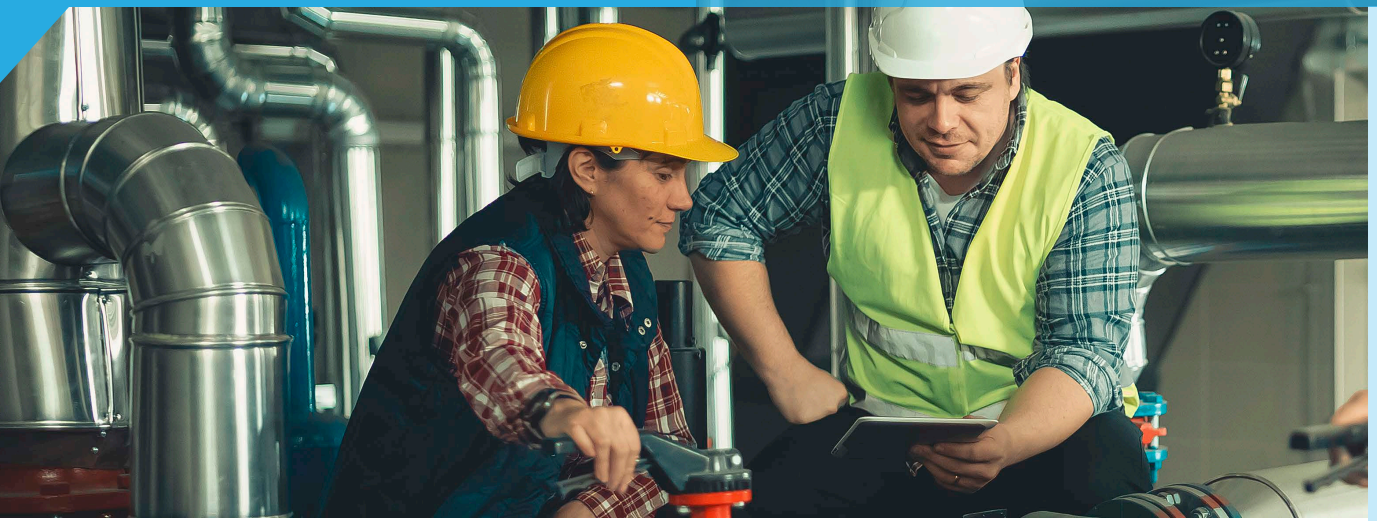


Table 3. Value Chain Employment By Clean Energy Sector, 2019

Clean Energy Sector	Clean Energy Generation	Clean Grid & Storage	Energy Efficiency	Clean Fuels	Alternative Transportation	TOTAL
Agriculture and Forestry	–	–	–	59	–	**59**
Utilities	1,186	–	–	–	–	**1,186**
Construction	1,277	476	18,014	–	–	**19,767**
Manufacturing	351	64	2,316	164	318	**3,213**
Trade	433	39	3,950	351	371	**5,145**
Professional & Business Services	867	146	11,065	60	99	**12,237**
Other Services	716	37	655	3	1,076	**2,488**
TOTAL	**4,830**	**761**	**36,000**	**638**	**1,865**	**44,094**

Table 4. Value Chain Proportional Employment By Clean Energy Sector, 2019

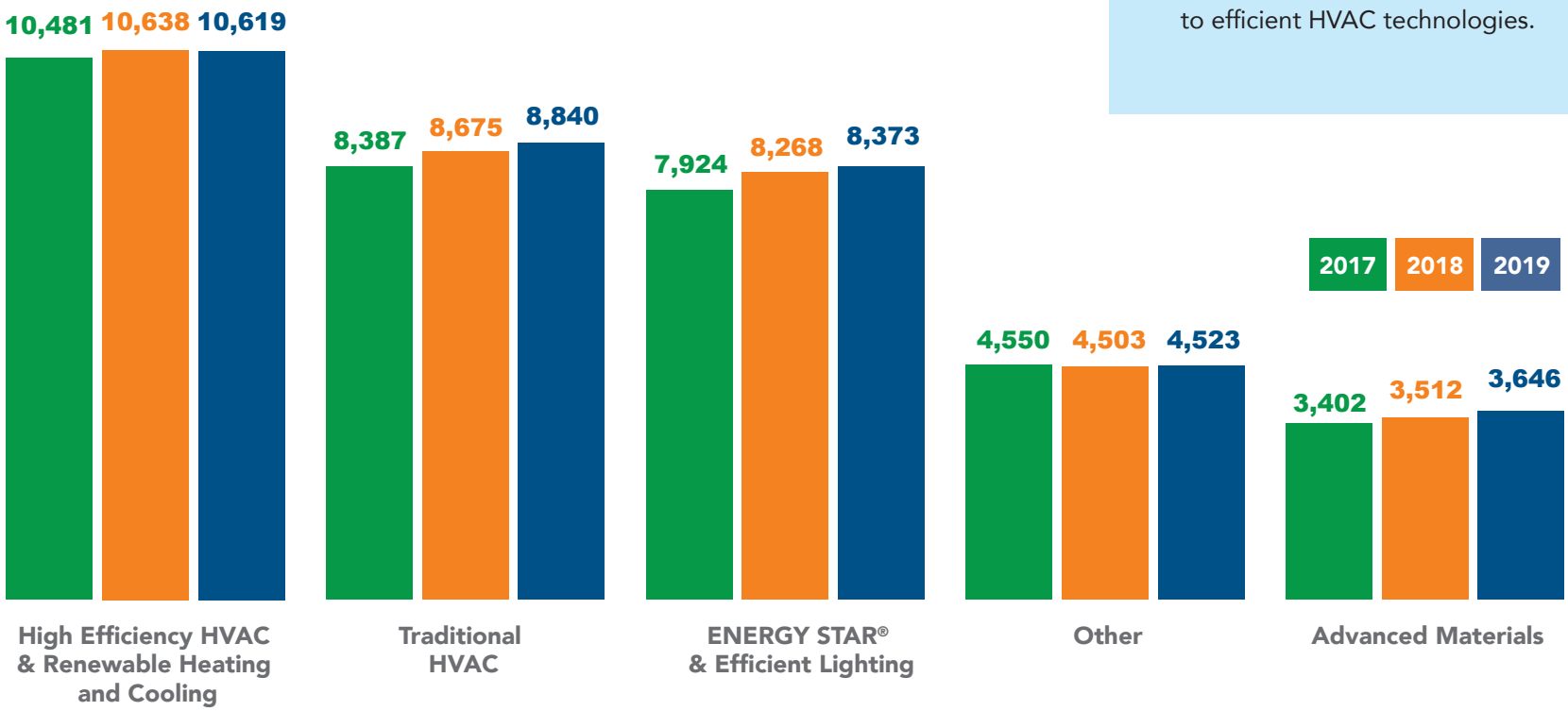
Clean Energy Sector	Clean Energy Generation	Clean Grid & Storage	Energy Efficiency	Clean Fuels	Alternative Transportation	Connecticut Clean Energy Average
Agriculture and Forestry	0.0%	0.0%	0.0%	9.3%	0.0%	0.1%
Utilities	24.6%	0.0%	0.0%	0.0%	0.0%	2.7%
Construction	26.4%	62.5%	50.0%	0.0%	0.0%	44.8%
Manufacturing	7.3%	8.4%	6.4%	25.8%	17.1%	7.3%
Trade	9.0%	5.1%	11.0%	55.1%	19.9%	11.7%
Professional & Business Services	17.9%	19.1%	30.7%	9.5%	5.3%	27.8%
Other Services	14.8%	4.9%	1.8%	0.4%	57.7%	5.6%



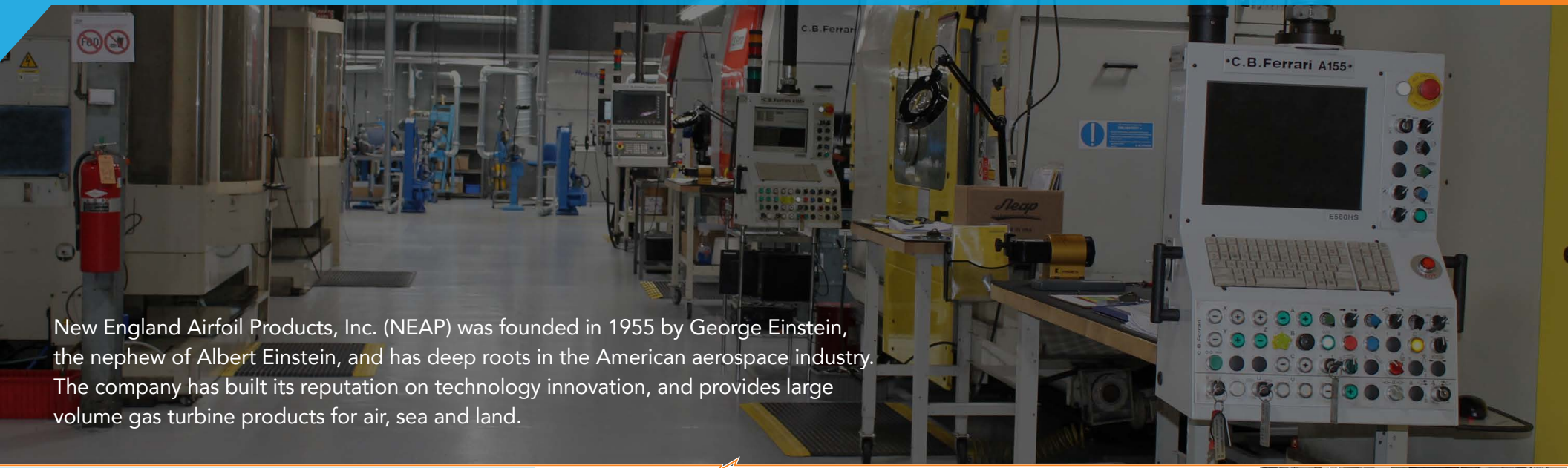
The major areas of energy efficiency activity include HVAC as well as ENERGY STAR® and efficient lighting technologies. Together, high efficiency HVAC and renewable heating and cooling[7] plus traditional HVAC account for 54 percent of the energy efficiency workforce, with high efficiency HVAC technologies accounting for a slightly larger portion of jobs (29.5 percent).

It should be noted that 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.

Figure 10. Energy Efficiency Employment By Sub-Technology, 2017-2019



[7] Renewable heating and cooling refers to establishments that are involved in heating, ventilation, and air conditioning (HVAC) from renewable energy sources or work that increases the energy efficiency of HVAC systems, such as solar thermal or air source heat pumps.



New England Airfoil Products, Inc. (NEAP) was founded in 1955 by George Einstein, the nephew of Albert Einstein, and has deep roots in the American aerospace industry. The company has built its reputation on technology innovation, and provides large volume gas turbine products for air, sea and land.

Results Summary

- More than $50,000 in annual energy savings
- 600 million kilowatt-hours saved over the anticipated lifespan of the new equipment, LED lighting and controls
- NEAP added more than 125 full-time employees and took on new assignments over the past three years

Annual energy savings & environmental benefits are equivalent to:

- 470 tons of carbon dioxide emissions avoided
- 90 cars taken off the road for a year

The Challenge

Purchased in 2016 by Pietro Rosa TBM, a leading international manufacturer of compressor airfoils and mission-critical components, NEAP set out to update the machinery and equipment and expand the Farmington, CT, facility's production capacity to serve customers including the USAF and NASA.

The Eversource Solution:

The international manufacturer turned to Eversource for technical expertise. To date, NEAP has invested more than $20 million in new manufacturing equipment, expanded its workforce and worked with Eversource on facility upgrades to enhance energy efficiency. Together, several new energy efficient improvements were introduced including:

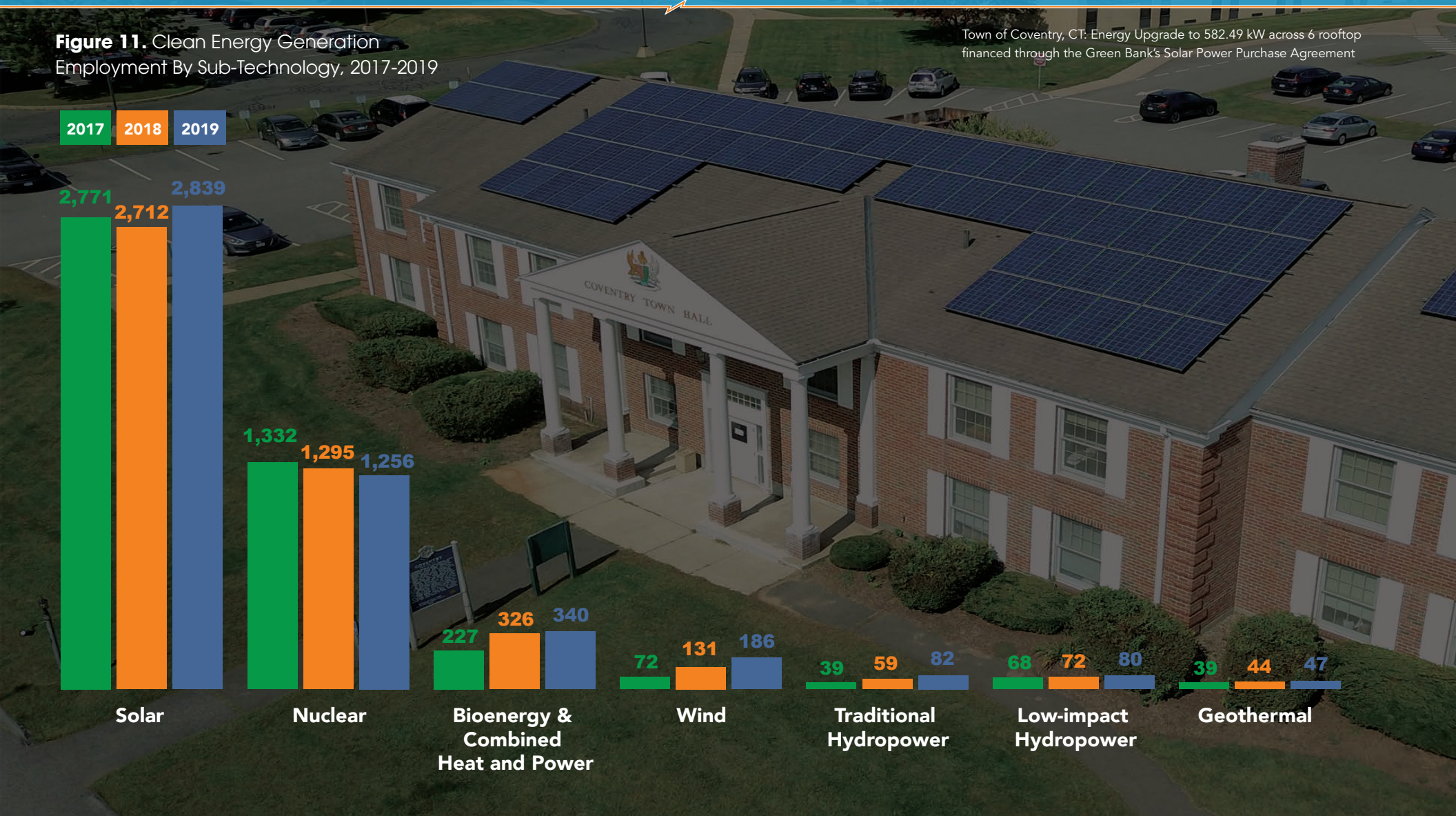
- An energy-efficient LED lighting system that uses up to 75 percent less electricity and reduces operating and maintenance costs by nearly 80 percent.
- Specification and installation of a new air compressor with variable-frequency drives (VFDs) to regulate air handlers, exhaust heat and cut energy use by more than 35 percent, as compared to non-VFD models.

The savings from the completed projects has freed up capital and allowed NEAP to expand production capacity, invest in workforce development and fuel business growth.

Solar and nuclear power generation are the largest components of the clean energy generation workforce in Connecticut. The state's solar industry rebounded following a two percent decline between 2017 and 2018 resulting from changes in domestic business models (e.g., collapse of Solar City) and global trade tariffs (i.e., US tariffs of Chinese imports). In total, over the last two years, the solar sector grew by 2.4 percent, or 67 additional jobs. Between 2018 and 2019 alone, Connecticut's solar businesses grew employment by 4.7 percent, or 127 jobs—more than double the previous year's loss.

Nuclear power generation jobs have declined since 2017, shedding 76 workers for a loss of 5.7 percent over two years. These declines also mirror nationwide trends, as the United States continues to focus more heavily on natural gas and renewable electric power generation.

Figure 11. Clean Energy Generation Employment By Sub-Technology, 2017-2019

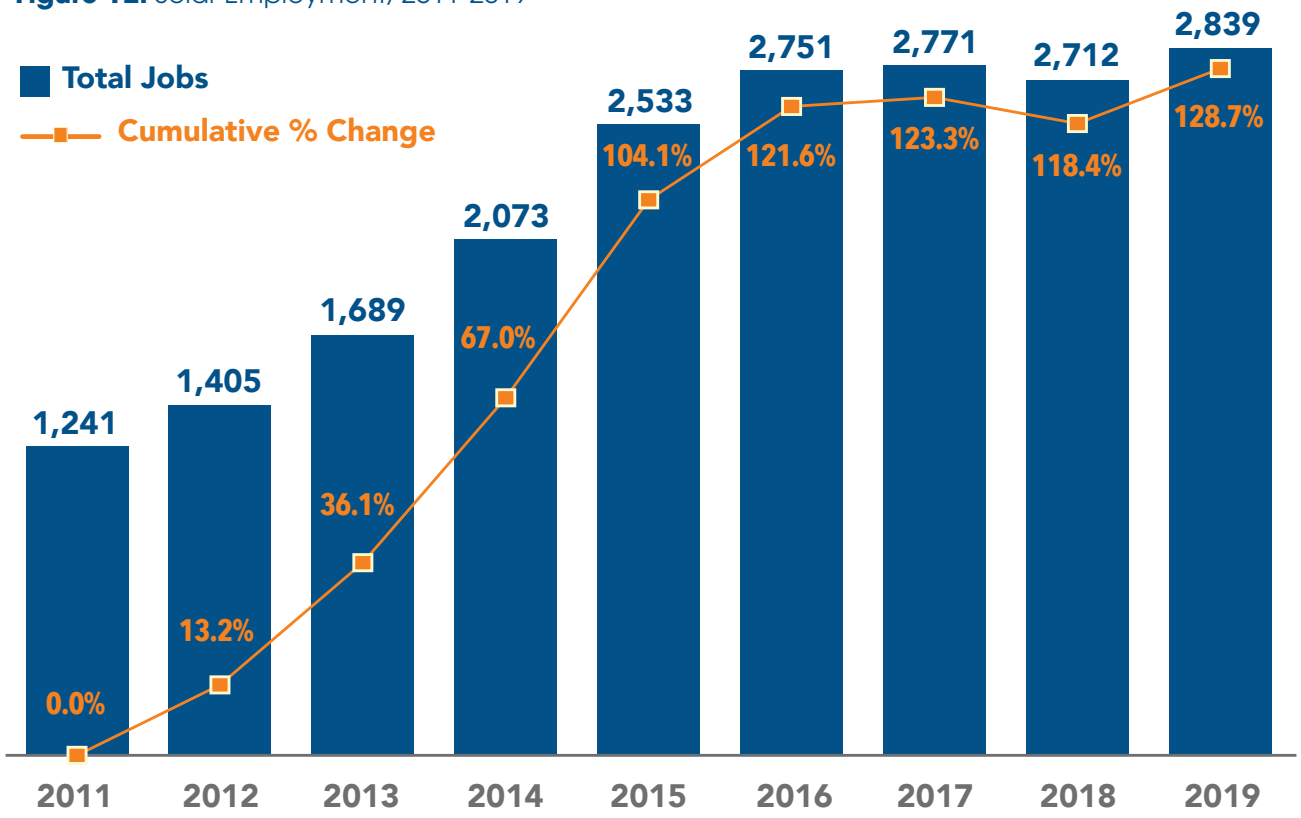


Town of Coventry, CT: Energy Upgrade to 582.49 kW across 6 rooftop financed through the Green Bank's Solar Power Purchase Agreement

Supportive state policies and programs have helped increase demand for solar deployment in Connecticut, which has helped increase jobs in recent years. For example, the Residential Solar Investment Program (RSIP) launched in 2012 has helped more than 40,000 homeowners go solar by providing incentives. According to recent findings from Solar Energy Industries Association (SEIA), Connecticut had a higher watts per capita residential solar installation rate from 2017-2019 than seven neighboring northeast states.

On the non-residential side, the Zero Emissions Renewable Energy Credit (ZREC), offered through the utility companies, provides a revenue stream to commercial property owners based on kilowatt hour (kWh) of solar energy produced. The increased promotion of solar power purchase agreements (PPAs) has also supported solar deployment on municipal, nonprofit and other commercial properties.

Figure 12. Solar Employment, 2011-2019



Commercial Property Assessed Clean Energy (C-PACE) financing has created nearly 1,800 jobs across more than 300 projects at businesses across the state, like this solar installation on a recreational facility in Trumbull.

The Hartford Area Habitat for Humanity (HAHFH)

The Hartford Area Habitat for Humanity (HAHFH) and partners Eversource, Home Energy Technologies, Posigen and Connecticut Green Bank celebrated the construction of Habitat's first Zero Energy Ready Home (ZERH), located at 153 Roosevelt in South Hartford in May 2019.

Since 2002, HAHFH has built ENERGY STAR standard homes. For their 30th anniversary, they wanted to build a high-performance, sustainable home that would decrease the burden of homeownership making it more affordable for their clients.

Home ownership has a lasting impact on families, and is critical to building stronger communities. The ZERH movement into Hartford's affordable housing sector, and partnerships like these, help lower emissions and achieve a clean-energy future.

To achieve the ZERH designation, the Roosevelt home achieved several criteria, such as optimal thermal protection, whole house water protection, high-performance heating and cooling, high-efficiency components, comprehensive indoor air quality, and solar ready construction.

The 1,200 square foot, three-bedroom home features ENERGY STAR-certified appliances, low-flow fixtures, a heat pump hot water heater, air tight construction and solar panels. It also achieved a Home Energy Rating System (HERS) index of –15, which is the industry standard for measuring a home's energy efficiency.

As a ZERH, the Roosevelt home will be at least 40-50 percent more energy efficient than a typical new home, leaving the homeowners with a net zero energy bill, and a carbon free-home.

Unveiled during a dedication ceremony on May 31, 2019, the Roosevelt home is built to Department of Energy's Zero Energy Ready Home standards, and is so energy efficient it can offset all or most of its energy consumption.

Solar PV and EE Improves Economy for Low and Moderate Income Residents

With the highest energy costs in the continental United States, Connecticut residents are realizing the value of making their home more energy efficient to reduce demand and adding solar photovoltaic systems to create their own electricity. More than 40,000 households are using solar energy, including a growing number of low- and moderate-income families.

"Everyone said it was crazy to go solar, now they all want it. People don't realize there are savings," said Melvin, a Bridgeport homeowner who went solar in June 2015. "Our bill during the winter was $460 and now it is $15." After his positive experience, Melvin convinced three neighbors to also seek the benefits of going solar and having a more efficient home.

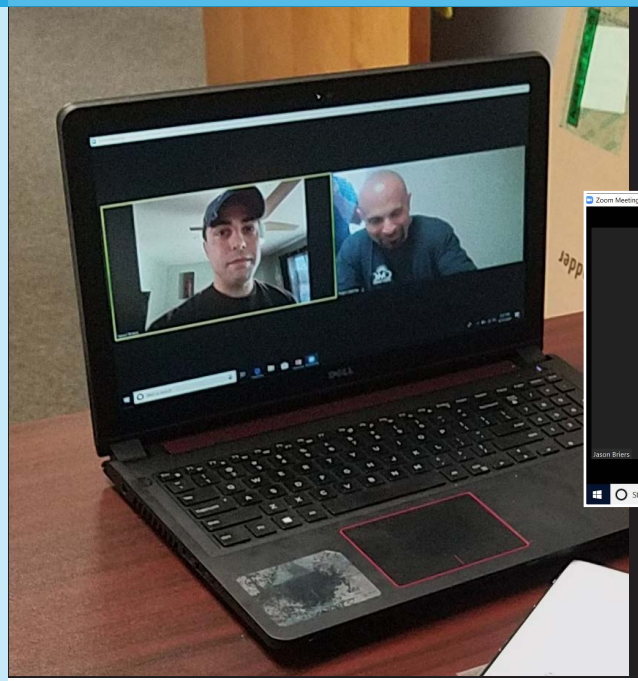
Solar PV Increased Commercial Business Bottomline

Glenbrook Industrial Park in Stamford used C-PACE financing for the installation of a 135 kW solar PV system and upgrades to their roof. Projected savings over the effective useful life of the upgrades is expected to surpass $1 million. The 181,216-square-foot facility houses various artisans and light manufacturing firms.

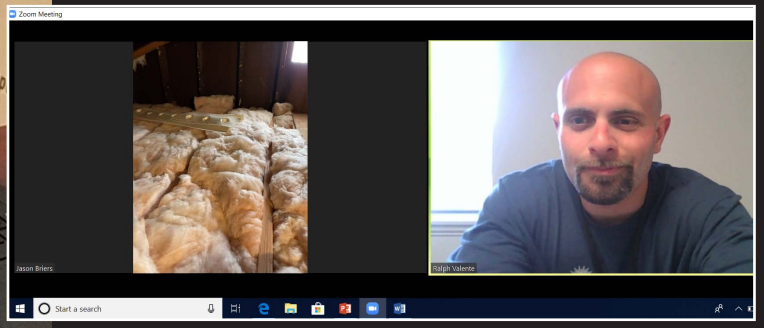
In one easy visit, utility-approved technicians will evaluate a home's energy performance and install basic weatherization and energy-saving measures such as sealing air leaks and installing energy-efficient lighting, faucet aerators and low-flow showerheads. The average home in Connecticut receives about $1,000 in services and realizes $200-$250 in savings on their annual energy bills. Additionally, the technicians will provide written recommendations for deeper energy-saving measures such as Wi-Fi thermostats, insulation, high-efficiency heating and cooling, water heating, windows and appliances. To help customers make smart energy choices, recommendations will include information on rebates and financing along with payback and investment information specific to the home. These services are available for homeowners, renters, and landlords of 4 units or less and single-family homes. Additional opportunities are available for income eligible customers and multi-family building of 5 plus units.

In the wake of COVID-19, a virtual pre-assessment to Home Energy Solutions is now being offered as a safe, convenient first step for customers to make energy-saving improvements. This pre-assessment is available through live, virtual discussions with a technician at no cost.

Home energy assessments morph to meet customer needs to deliver efficiency and meet safety protocols.

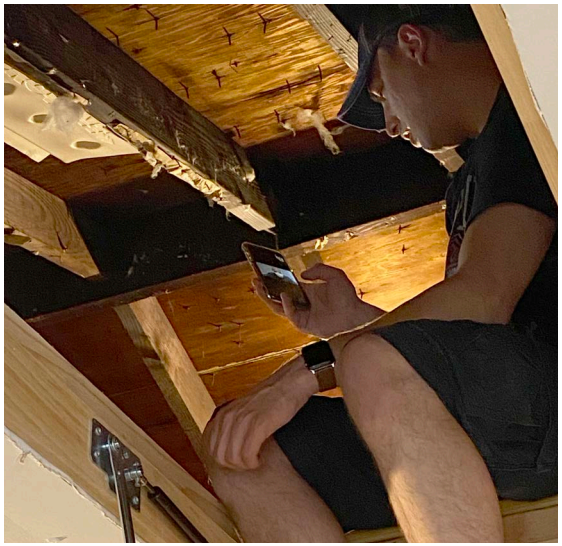


Technicians connect with customers using a variety of video chat tools to virtually assess homes and collect information from customers.

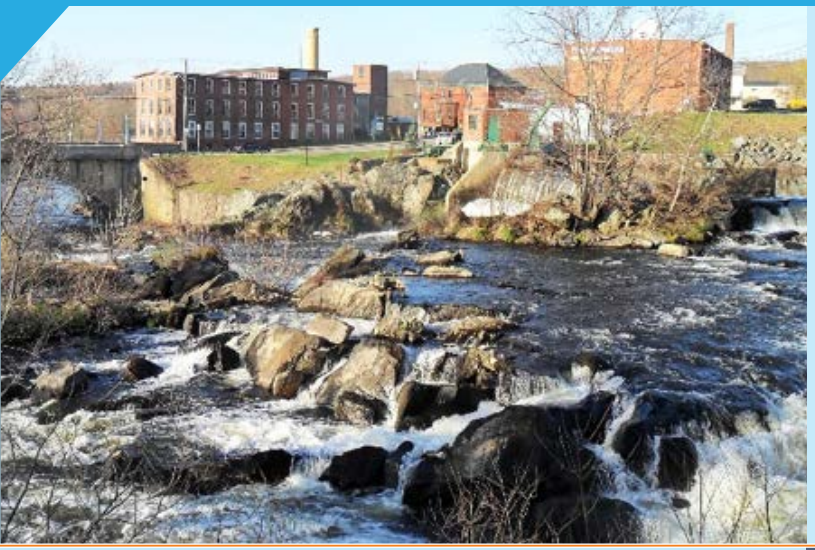


Technology allows technician insights to the home before scheduling the on-site visit.

Customers can identify key information on equipment and heating types for technicians.



And when they have access, the customer can provide other key perspectives of their home and existing conditions for the technicians.



Economic Gains Flow from Hydro Project Combined with Energy Efficiency for Mixed Use Property

A small hydroelectric retrofit project like the one at Cargill Falls Mill in Putnam can create benefits for many stakeholders. In this case, the historic mill building will be redeveloped into 82 mixed-income residential units and 30,000 square feet of commercial space, integrating the approximately 900 kW hydroelectric plant on site. When completed, this project, which uses $6.2 million in Green Bank financing for the restoration of the powerhouse and deep energy retrofits of the property, will help revitalize downtown Putnam and provide much-needed affordable housing in the state's "quiet corner".

Hydropower and Offshore Wind

In June 2019, Governor Ned Lamont, with bipartisan support from the Connecticut General Assembly signed *Public Act 19-71, An Act Concerning the Procurement of Energy Derived from Offshore Wind*, which was a major step toward the goal of a 100% zero-carbon electricity supply by 2040. Since then, projects that would benefit coastal cities, like Bridgeport and New London, and create thousands of jobs in the process have been discussed and continue through the approval process. The development of offshore wind projects is seen as a key component of the state's clean energy future.

The largest share of alternative transportation workers is found across firms that work with hybrid electric vehicles. These companies employ 860 workers, or 46 percent of the alternative transportation workforce in Connecticut. Following hybrid electric vehicles, electric vehicle and plug-in hybrid vehicle companies comprise a respective 23 and 21 percent of clean transportation jobs. All sub-sectors have grown since 2017, together creating about 200 new jobs in two years.

Between 2017 and 2018, hybrid electric, electric, and plug-in hybrid vehicles respectively increased by 15 percent, 27 percent, and 35 percent, resulting 335 new alternative transportation workers. The following year, between 2018 and 2019, each sub-sector declined slightly—a collective loss of 136 workers.

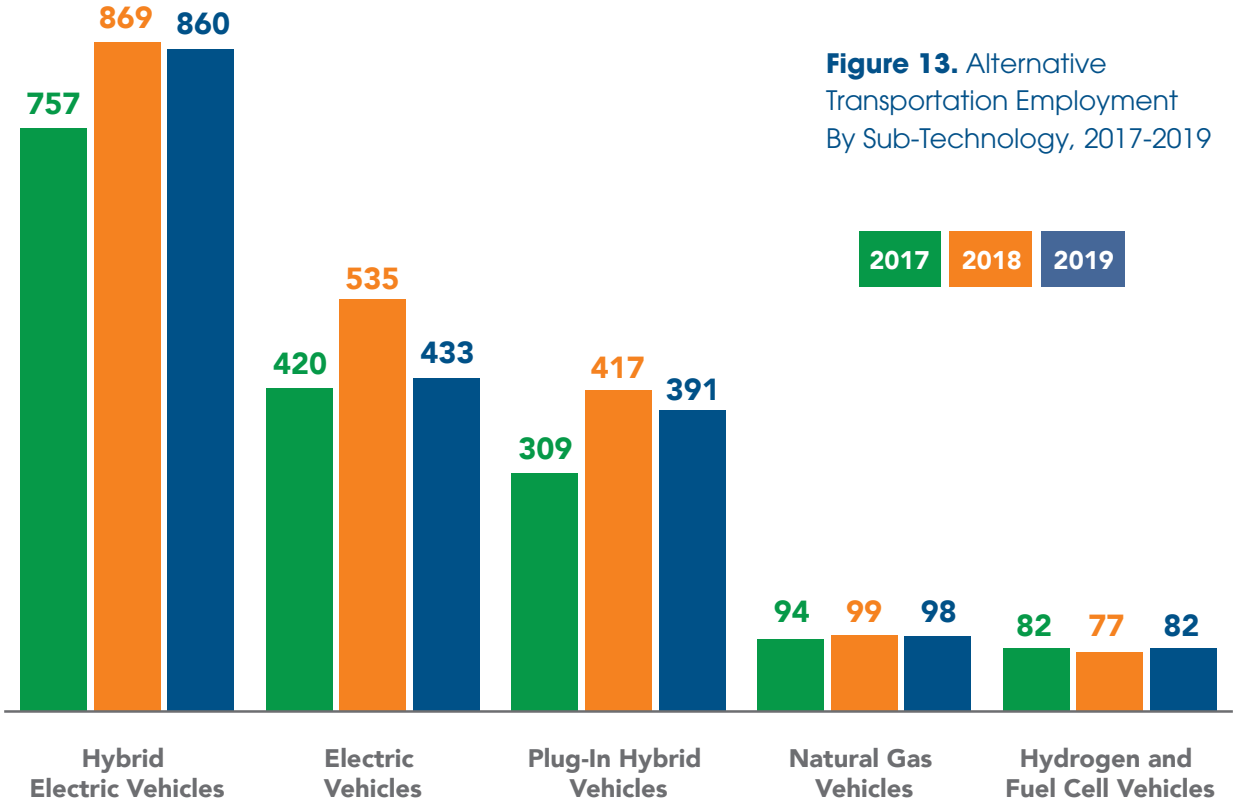


Figure 13. Alternative Transportation Employment By Sub-Technology, 2017-2019

EV and CHEAPR Incentive

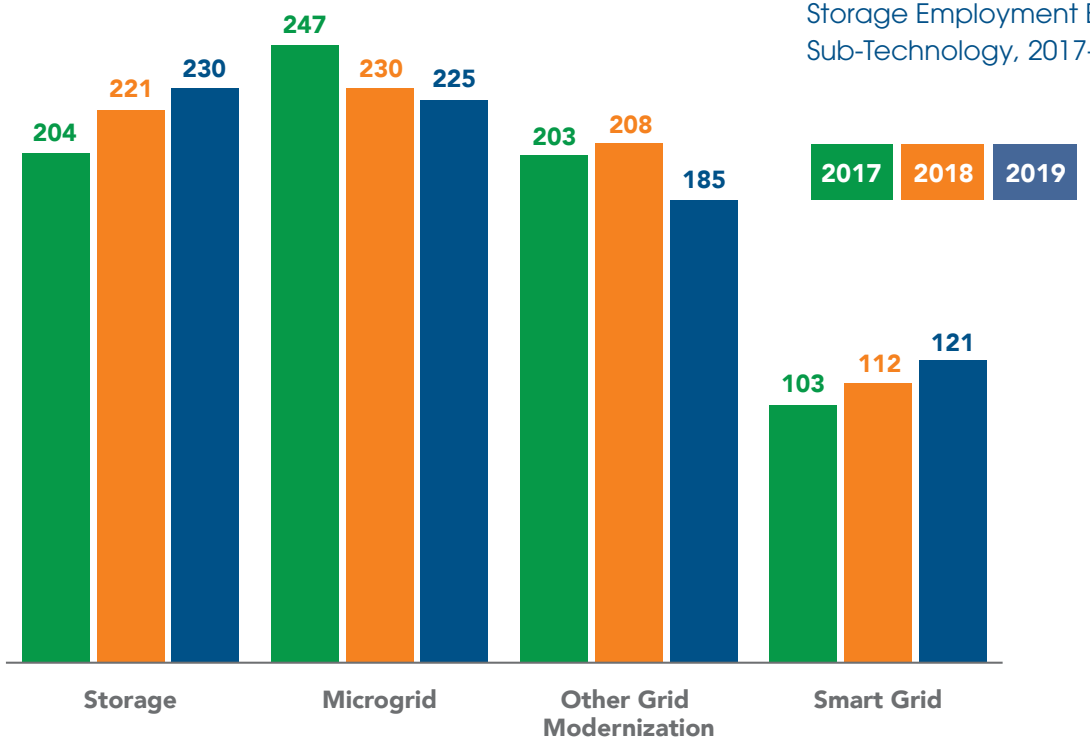
The EV and CHEAPR initiative provides incentives of up to $5,000 for around 30 recognized battery electric vehicles, plug-in hybrid electric vehicles and fuel cell electric vehicles. These incentives can be realized on new as well as used EV's and given that the eligible vehicles are sold by automobile dealerships franchised in Connecticut. Additionally, EVConnecticut also provides incentives to municipal and state agencies for establishing EV charging stations to promote an EV charging network to provide reliance on EV's for long range travels.

A small sector in Connecticut's clean energy economy, clean grid and storage accounted for 761 jobs in 2019. Storage companies[8] support 30.2 percent of jobs, closely followed by microgrid firms (29.6 percent), other grid modernization (24.3 percent), and smart grid companies (15.9 percent).

Storage and smart grid companies represent all the job growth since 2017, growing a respective 12.8 percent and 17.8 percent—a net increase of 44 jobs in two years. Microgrid and other grid modernization firms lost 41 jobs over the same time frame.

[8] 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.

Figure 14. Clean Grid And Storage Employment By Sub-Technology, 2017-2019



Equitable Modern Grid – Docket No. 17-12-03

On October 2, 2019, the Connecticut Public Utilities Regulatory Authority (PURA) announced its **Framework for an Equitable Modern Grid**, or Grid Modernization dockets, beginning with six dockets covering energy affordability, electric storage, advanced metering infrastructure, zero emissions vehicles, innovation pilots, and interconnection standards.

PURA's energy affordability docket is addressing the barriers to energy affordability and equity for all customer classes. PURA's docket on advanced metering infrastructure will evaluate proposals for the full deployment of smart meters in the state. PURA's docket on electric storage programs and measures looks to leverage the multiple benefits storage can provide to ratepayers. PURA's docket on electric vehicles will establish programs and enable infrastructure investments to meet Connecticut's commitment to the deploying 125,000 – 150,000 electric vehicles by 2025. PURA's docket on Innovation Pilots will identify a prospective structure to support the ongoing development of innovative technology in Connecticut. Lastly, PURA's docket on the utility's interconnection guidelines and procedures will modify the interconnection process to reduce costs and better facilitating the interconnection of distributed energy resources.

The United States Energy and Employment Report (USEER) does not explicitly capture fuel cell employment outside of the "hydrogen and fuel cell" sub-technology within the motor vehicles sector. As such, fuel cell jobs often exist across multiple sectors in addition to motor vehicles, such as electric power generation; transmission, distribution, and storage; and fuels. While it is difficult to extrapolate the total number of individuals engaged in fuel cell technologies across Connecticut, it is widely known that the state is a national leader in stationary hydrogen fuel cell technologies. Future USEER data collection will incorporate improved methodologies to fully extrapolate fuel-cell related employment totals.

In 2016, The US Department of Energy's Fuel Cell Technologies Office recognized Connecticut as one of the top 3 fuel cell states in the country due to high levels of funding and deployment. The report found that more than 600 companies are part of the state's fuel cell and hydrogen supply chain.[9] FuelCell Energy (378 employees), Doosan Fuel Cell America (66 employees), and Proton OnSite (125 employees).[10] are among the largest fuel cell companies in the country, earning Connecticut the nickname of the "Silicon Valley" for fuel cell technology.[11] A 2017 economic analysis found that Connecticut's hydrogen and fuel cell supply chain contributed more than $600 million in revenue and investments and 2,800 direct, indirect, and induced jobs to the region's economy.[12]

Fuel cells are currently classified in Connecticut statute as a Class I renewable energy source, lending it preferential status for Renewable Energy Credits in pursuit of the state's Renewable Portfolio Standard. Fuel cells are supported through the LREC procurement, microgrid policies, and competitive procurements. In addition, Congress has extended the national investment tax credit for fuel cells—currently at 26 percent—through 2022.[13]

According to the Connecticut Hydrogen-Fuel Cell Coalition—which is administered by the Connecticut Center for Advanced Technology and comprised of industry, academic, and government stakeholders—the total capacity of existing or approved fuel cells in the state exceeds 105 megawatts (MW) across nearly 100 sites.[14] A 2018 report by the Northeast Electromechanical Energy Storage Cluster (NEESC) determined that Connecticut has the potential to install 170 MW of hydrogen fuel cells, with an annual output of approximately 1.44 million megawatt hours.[15]

Connecticut has also sought to leverage transportation applications of hydrogen fuel cells. The state's transit system was one of the first to demonstrate fuel cell busses, at one time boasting five fuel cells busses in their fleet.[16,17] The state is also home to two publicly-available refueling stations for hydrogen cars, with eleven more in development.[18] The NEESC recommends that the state develop six to seven hydrogen refueling stations for a goal of supporting nearly 600 fuel cell electric vehicles.[19]

Supporting a State Strength: Fuel Cell Technology

Connecticut has long been a pioneering state when it comes to the fuel cell industry, particularly manufacturing and development. In recent years, the Green Bank has worked with Fuel Cell Energy (FCE) to secure financing on major deployment projects that benefit Connecticut, including a $23 million financing facility to support the 7.4 megawatts (MW) power plant being built for the US Navy Submarine Base in Groton.

[9] US Department of Energy. State of the States: Fuel Cells in America 2016, 7th Edition. November 2016.
[10] Company employment estimates are taken from DatabaseUSA.com via Emsi Business Listings and should be used with caution. The estimate for Proton OnSite was taken from the company's Owler business listing: https://www.owler.com/company/protononsite.
[11] https://www.ctpost.com/local/article/Fuel-cell-companies-reach-out-to-legislators-for-12653242.php
[12] Northeast Electromechanical Energy Storage Cluster. Connecticut Hydrogen Economy. January 2018.
[13] https://www.greentechmedia.com/articles/read/will-high-temperature-fuel-cells-scale
[14] http://chfcc.org/ct-fuel-cell-installations-and-approved-projects/
[15] Northeast Electromechanical Energy Storage Cluster. Connecticut Hydrogen Economy. January 2018.
[16] National Renewable Energy Laboratory. Fuel Cell Buses in U.S. Transit Fleets: Current Status 2017. November 2017.
[17] https://www.hartfordbusiness.com/article/ct-laying-groundwork-for-next-green-wave-hydrogen-cars
[18] Northeast Electromechanical Energy Storage Cluster. Connecticut: Market Potential for Hydrogen and Fuel Cell Transportation Applications. February 2017.
[19] Northeast Electromechanical Energy Storage Cluster. Connecticut Hydrogen Economy. January 2018.

Other biofuels, which is defined as any other fuel that is derived directly from living matter, accounts for 46.5 percent of total clean fuels employment in Connecticut. This is followed by nuclear fuels (29.5 percent), woody biomass (17.7 percent), and other ethanol and non-woody biomass[20] (6.3 percent).

Though small, woody biomass jobs have grown the most since 2017. These businesses have created 60 jobs in two years—a growth rate of 114 percent.

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

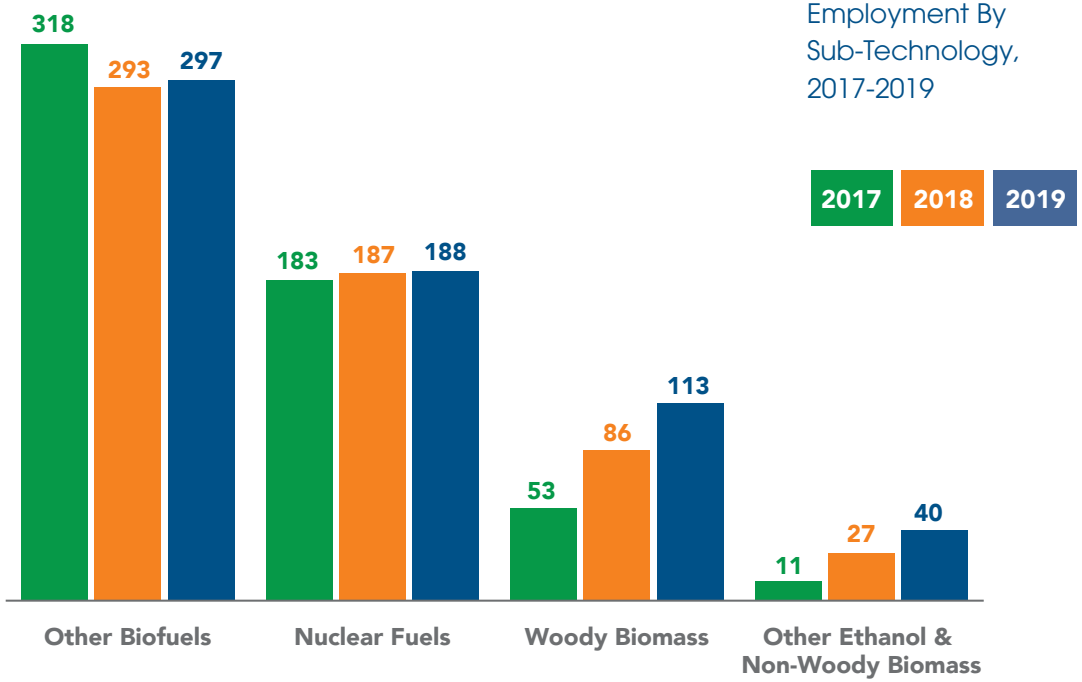


Figure 15. Clean Fuels Employment By Sub-Technology, 2017-2019

From Food Waste to Energy and Jobs

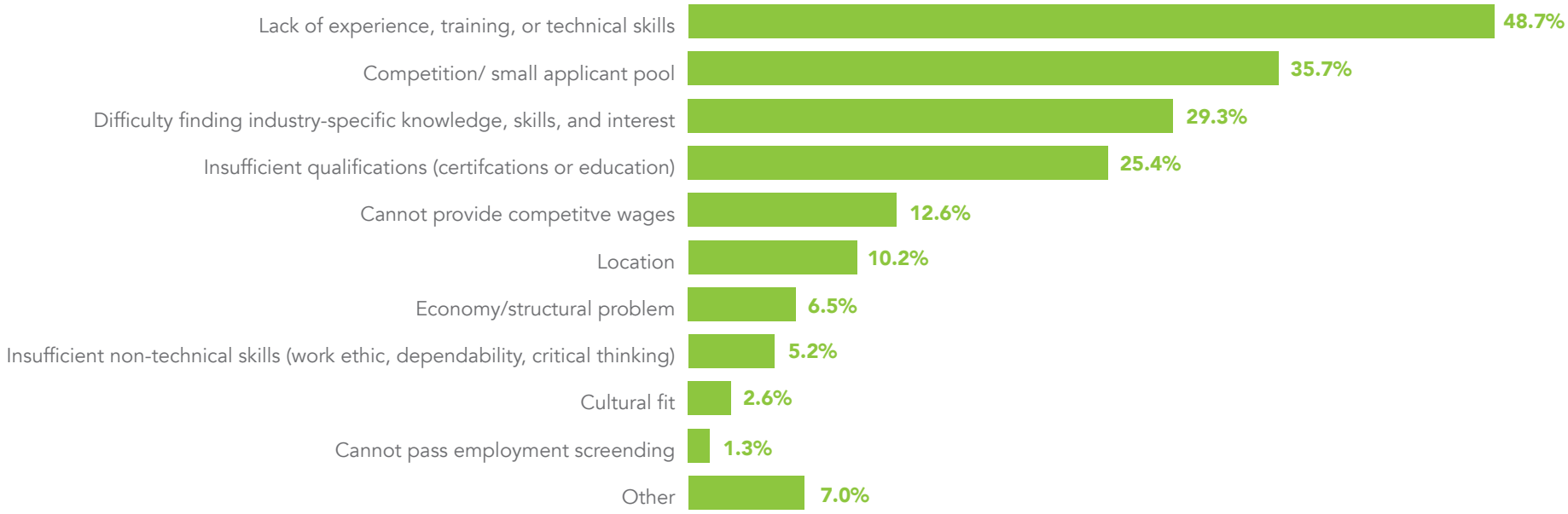
In 2016, the state's only food waste-to-energy plant, Quantum Biopower, opened in Southington, with support from the Connecticut Green Bank, People's United Bank, and the Department of Energy and Environmental Protection. The plant uses the anaerobic digestion process to generate about 1.2 megawatts of Class 1 electricity annually, offsetting an estimated 5,000 tons of greenhouse gas emissions through the recycling of 40,000 tons of food waste.

The majority of clean energy employers reported hiring difficulty in Connecticut. Just over three quarters (77 percent) of employers indicated that they had difficulty hiring between the end of 2018 and the end of 2019; three in ten reported that hiring was very difficult. However, hiring difficulty for Connecticut clean energy employers was lower compared to the national average. Across the United States, 84 percent of employers had hiring difficulty between 2018 and 2019.

The top reported reasons for hiring difficulty include lack of experience, competition and a small applicant pool, and difficulty finding industry-specific knowledge.

Figure 16. Employer-Reported Hiring Difficulty, 2019

Figure 17. Reasons For Hiring Difficulty In Connecticut, 2019



Clean energy employment is concentrated across Hartford, Fairfield, and New Haven counties in Connecticut. These three counties together account for about eight in ten clean energy workers across the state (79.4 percent).

Figure 18. Clean Energy Employment By County, 2019[21]

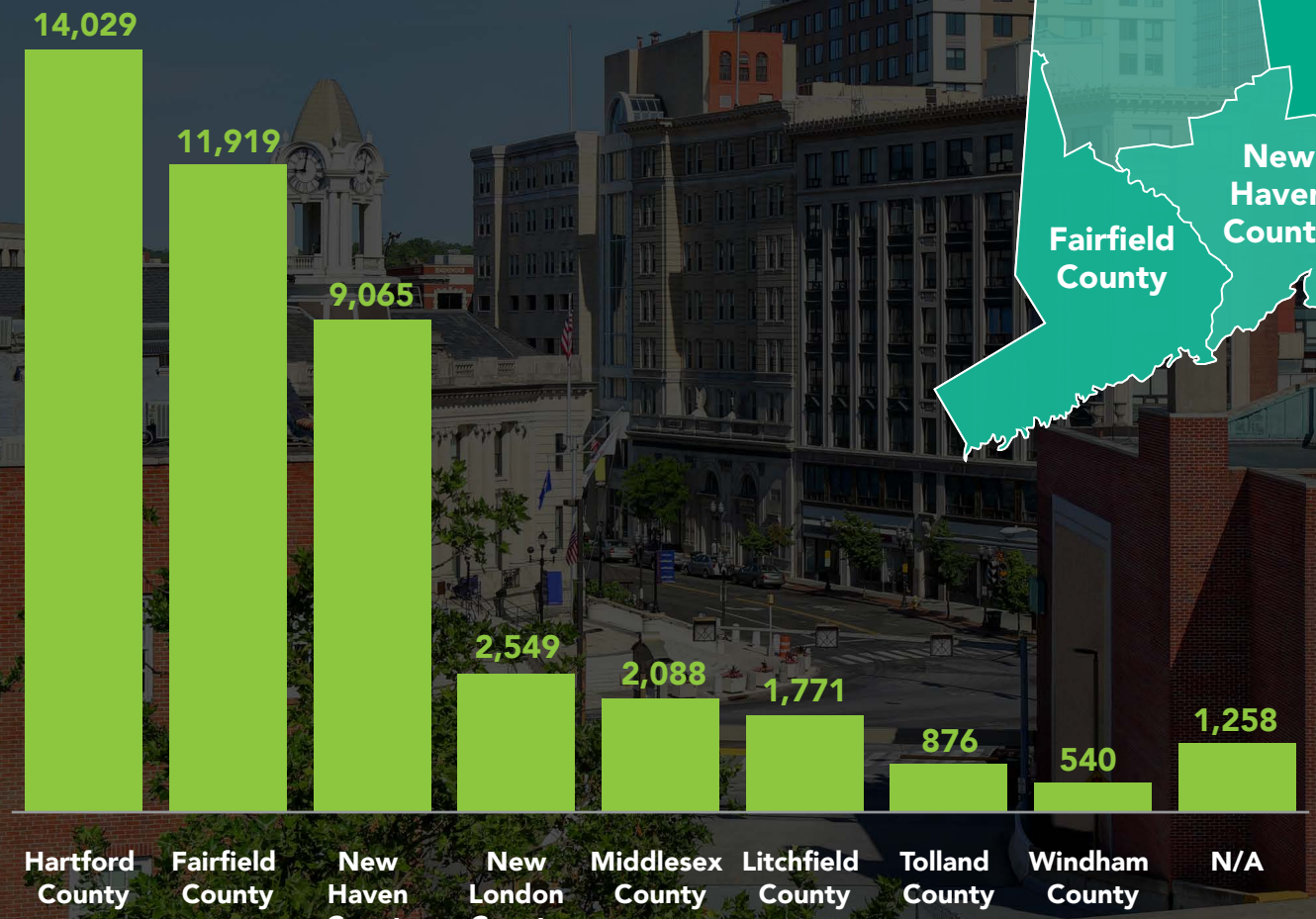
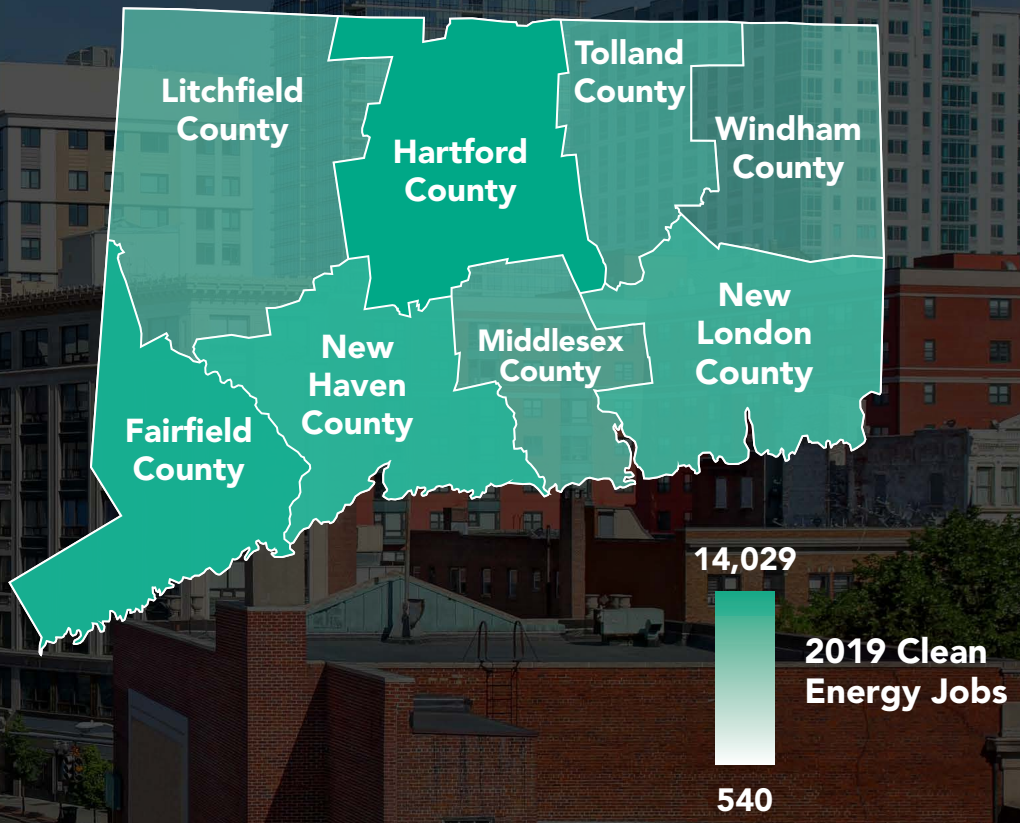


Figure 19. Map Of Clean Energy Employment By County, 2019



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

Stamford in Fairfield County, CT

Clean energy training programs are largely focused in the same counties that have a high proportion of clean energy jobs. These counties include the following: New Haven (30 percent), Hartford (19 percent), and Fairfield (14 percent).

Just over a third of programs are also offered via web-based portals, making these accessible to all residents and age groups with internet and computer access. The proportion of web offerings is likely to increase in the future, as the COVID-19 pandemic continues to change the nature of work and education.

Table 5. Current Clean Energy-Related Training Programs By Location, 2019[22]

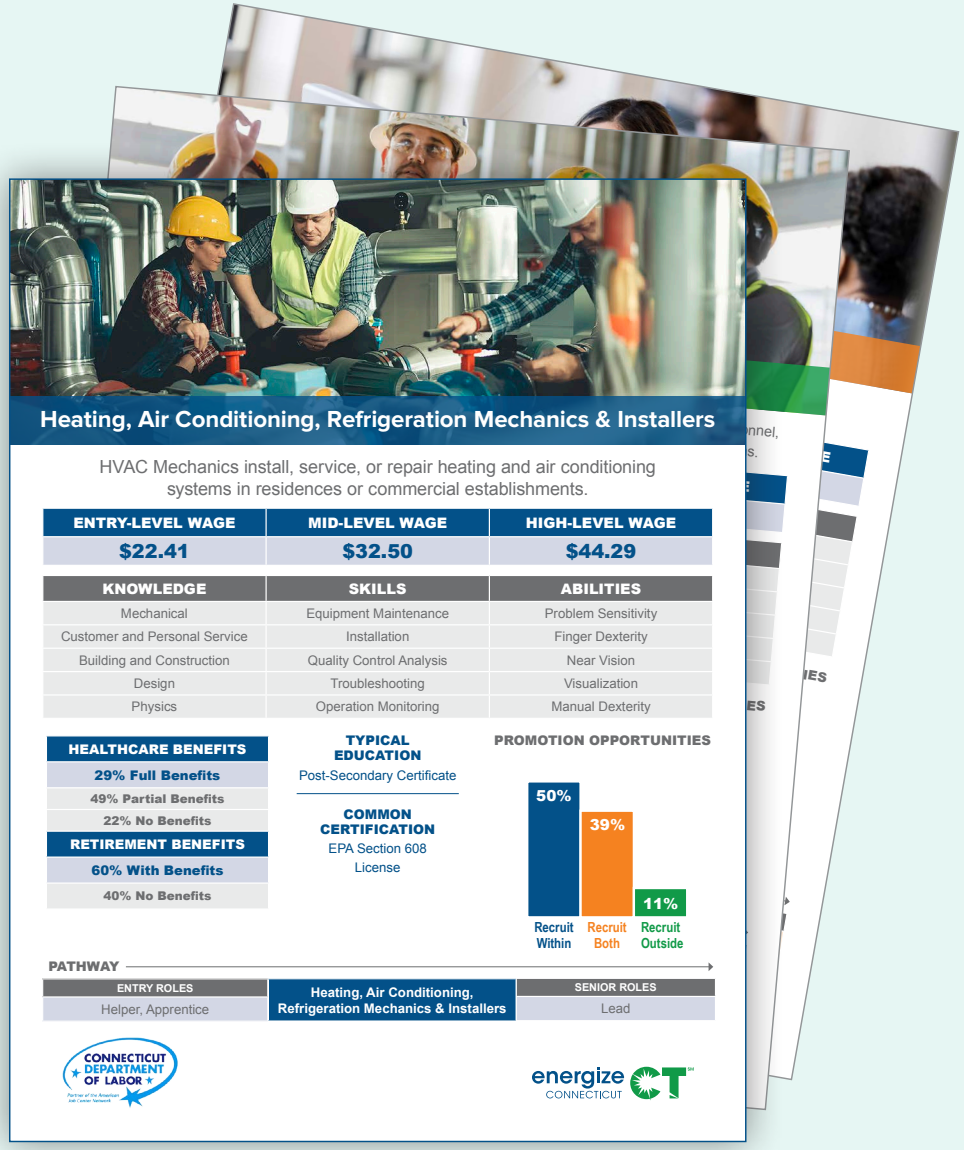
County	Program Offerings	Locational Distribution
Fairfield	37	13.90%
New Haven	80	30.00%
Hartford	51	19.10%
Middlesex	20	7.50%
Windham	14	5.20%
Tolland	2	0.70%
Litchfield	4	1.50%
New London	22	8.20%
Web	94	35.20%

[22] The locational distribution will not sum to 100 percent because many programs are offered in multiple counties. As such, the denominator is not the number of programs, but the number of locations. For example, if one program is offered in three counties, it is counted three times in the percent distribution.

With the passage of Public Act 19-35 "An Act Concerning a Green Economy and Environmental Protection," the Office of Workforce Competitiveness (OWC) is charged with establishing a career ladder for jobs in the green technology industry. In collaboration with OWC, BW Research and the Joint Committee, have produced ten (10) career profiles in clean energy that identify the requisite level of education, salary range, health care and retirement benefits, and more for the following clean energy technology jobs:

- Heating, Air Conditioning, and Refrigeration Mechanics and Installers
- Construction Laborers
- Insulation Workers, Floor, Ceiling and Wall
- Electricians
- Solar Photovoltaic Installers
- Sales Representative
- Construction Managers
- Bookkeeping, Accounting, and Auditing Clerks
- Engineers
- General and Operations Managers

These career profiles, as well as access to clean energy related training programs, are available at **www.ctgreenjobs.com.**



CONNECTICUT DEPARTMENT OF LABOR
Partner of the American Job Center Network

Connecticut's clean energy economy is slightly less diverse than the national clean energy labor market, though this may be in part due to the fact that the state in general has a lower proportion of Hispanic or Latinx and Black or African American workers compared to the nation overall.

Clean energy occupations are a good source of jobs for Veterans in the state, with 10.6 percent of clean energy positions in Connecticut held by Veterans of the U.S. Armed Forces. This is higher than the overall statewide average (four percent), the U.S. clean energy average (nine percent), and the U.S. overall proportion of Veterans in the workforce (six percent).

Union membership rates are higher-than-average for clean grid and storage (11.4 percent) and alternative transportation (8.5 percent).

Table 6. Clean Energy Workforce Demographics, 2019[23]

Workforce Demographic	Connecticut Clean Energy	Connecticut Overall	US Clean Energy	US Overall
Male	72.0%	51.7%	72.6%	53.0%
Female	28.0%	48.3%	27.4%	47.0%
Hispanic or Latino	10.1%	16.8%	16.5%	17.6%
Not Hispanic or Latino	89.9%	83.1%	83.5%	82.4%
American Indian or Alaska Native	0.8%	0.6%	1.4%	1.3%
Asian	6.0%	5.0%	8.2%	6.5%
Black or African American	5.8%	12.1%	8.4%	12.3%
Native Hawaiian or other Pacific Islander	0.7%	0.1%	1.0%	0.2%
White	82.0%	79.7%	73.1%	77.7%
Two or more races	4.8%	2.5%	7.9%	2.8%
Veterans	10.6%	4.1%	9.0%	5.7%
55 and over	14.8%	27.4%	13.6%	23.6%
Union	6.8%	14.5%	7.9%	6.2%

Table 7. Connecticut Union Membership Rate By Clean Energy Sector, 2019

Clean Energy Sector	Union Membership Rate
Clean Energy Average	6.8%
Clean Fuels	4.6%
Clean Energy Generation	4.2%
Clean Grid & Storage	11.4%
Energy Efficiency	7.0%
Alternative Transportation	8.5%

[23] Demographic data is pulled from the United States Energy and Employment Report 2019 (USEER 2019); the Bureau of Labor Statistics: Current Population Survey, Veterans News Release, and Union Membership Rates; as well asEmsi Population Demographics.

Data for the 2020 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, 537 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 +/- 4.22 percent for Connecticut at a 95 percent confidence interval.

The full research methodology for USEER may be found at: **https://www.usenergyjobs.org/**

About BW Research

BW Research is a full-service consulting and research firm that specializes in workforce and economic development for public entities, including workforce investment boards, economic development agencies, cities, counties, and educational institutions. BW Research has substantial experience in developing customized research projects and a deep understanding of the clean energy sector and its employers, workforce, and supply chain dynamics. BW Research has designed and conducted over 500 studies for public, private, and not-for-profit agencies throughout the United States and internationally.

The historic powerhouse at the Upper Collinsville Dam on the Farmington River in Canton will produce 1 MW of hydroelectric power when restoration is complete.

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 following sectors of Clean Energy Generation; Clean Grid and Storage; Energy Efficiency; Clean Fuels; and Alternative Transportation. 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 sub-technologies that are considered clean energy-related activities. The clean energy definition for Connecticut was developed through an iterative process with the Connecticut Green Bank, the Department of Energy and Environmental Protection, Eversource, and United Illuminating. 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.[24]

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

CLEAN FUELS

- Other Ethanol/Non-Woody Biomass, including biodiesel
- Woody Biomass/Cellulosic Biofuel
- Other Biofuels
- Nuclear Fuel

ALTERNATIVE TRANSPORTATION

- Hybrid Electric Vehicles
- Plug-In Hybrid Vehicles
- Electric Vehicles
- Natural Gas Vehicles
- Hydrogen Vehicles
- Fuel Cell Vehicles
- Other Vehicles

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[25]
- 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
- Reduced Water Consumption Products and Appliances
- Other Energy Efficiency

[24] 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

[25] "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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