



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

Meeting Date

June 17, 2020



Joint Committee

Eric Brown

Chair
CT Business & Industry Association

Michael Li

CT Department of Energy and
Environmental Protection (DEEP)

Ronald J. Araujo

Eversource
Connecticut Green Bank

Bryan Garcia

President and CEO
Connecticut Green Bank

John Harrity

Chair
CT Roundtable on Climate and Jobs

Jane Lano

United Illuminating

Bert Hunter

EVP/CIO Finance
Connecticut Green Bank

Brenda Watson

Executive Director
Operation Fuel



AGENDA

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

Online

June 17, 2020
1:30pm – 3:30pm

1. Call to Order
2. Public Comments (5 min)
3. Review and Approval of Minutes for December 18, 2019 (5 min)
4. COVID-19 Status – Updates (30 min)
5. Energy Jobs Report – Update (30 min)
6. C&LM Plan and Green Bank Comprehensive Plan – Reviews and Input (30 min)
 - a. FY21 Green Bank Comprehensive Plan
 - b. CY21 C&LM Plan
7. Plans for the Special Summer 2020 Legislative Session (15 min)
8. Other Business (5 min)
9. Adjourn

Join the meeting online at <https://global.gotomeeting.com/join/697664597>

Or dial in using your telephone:
Dial: 1 (571) 317-3122 / Access Code: 697-664-597



RESOLUTIONS

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

Online

June 17, 2020
1:30pm – 3:30pm

1. Call to Order
2. Public Comments (5 min)
3. Review and Approval of Minutes for December 18, 2019 (5 min)

Resolution #1

Motion to approve the meeting minutes of the Joint Committee for December 18, 2019

4. COVID-19 Status – Updates (30 min)
5. Energy Jobs Report – Update (30 min)
6. C&LM Plan and Green Bank Comprehensive Plan – Reviews and Input (30 min)
 - a. FY21 Green Bank Comprehensive Plan
 - b. CY21 C&LM Plan
7. Plans for the Special Summer 2020 Legislative Session (15 min)
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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

June 17, 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



Brenda Watson
Operation Fuel
(Green Bank Designee)



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Agenda Item #3

Approval of Meeting Minutes for December 18, 2019



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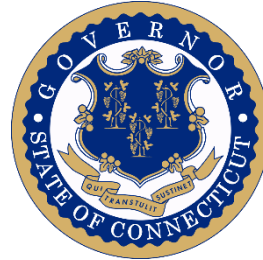
Agenda Item #4

COVID-19 Status – Updates

Overview and Purpose

Connecticut Clean Energy Industry Survey

This survey was put together by 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.



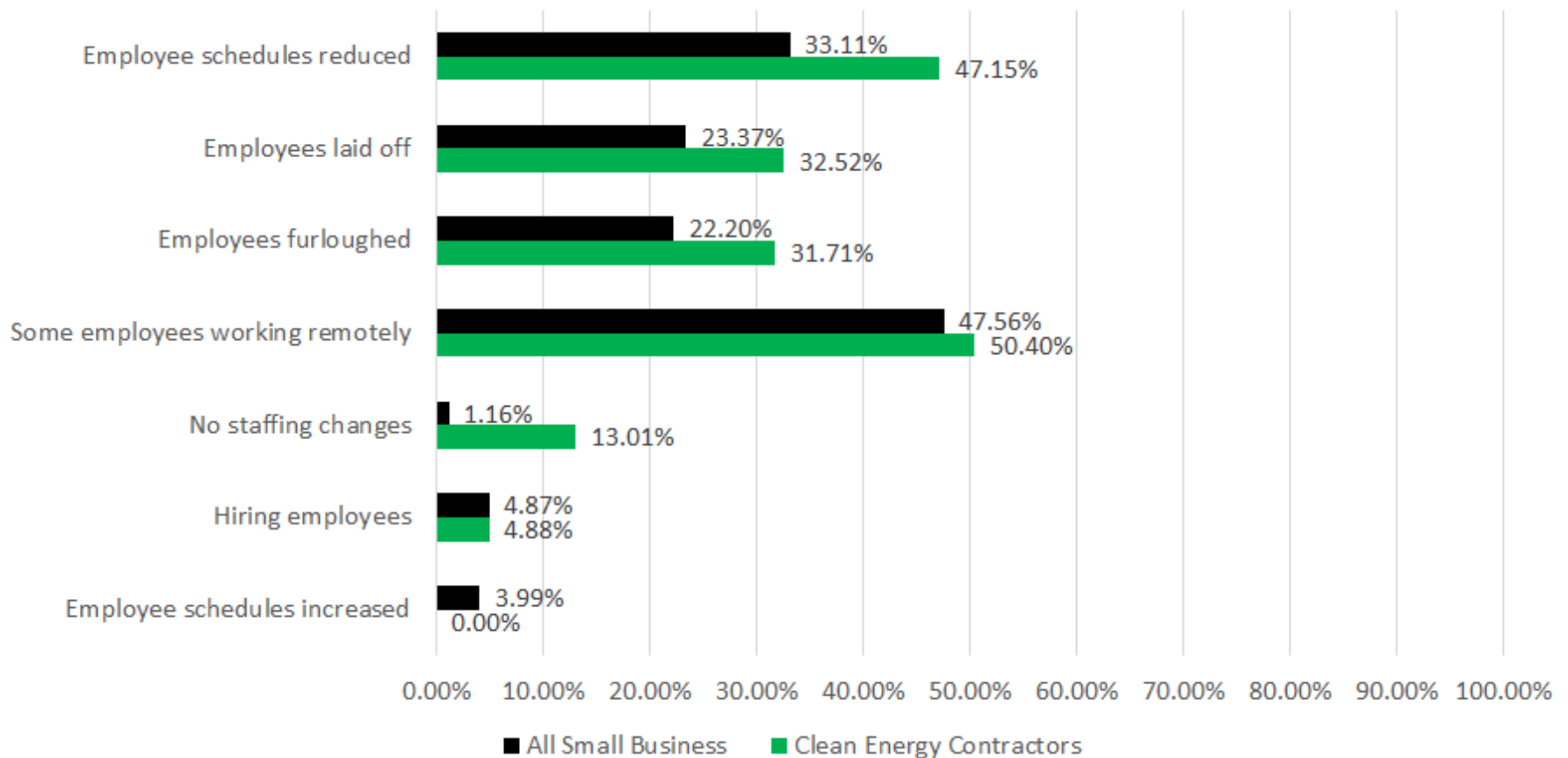
The purpose of this survey is to assess the impacts of COVID-19 on Connecticut's clean energy industry, and to increase our understanding of how the recovery, revitalization, and stabilization of the industry can be expedited once COVID-19 subsides.



COVID-19 Impact on Employees

Worse for Clean Energy Industry than All Small Businesses

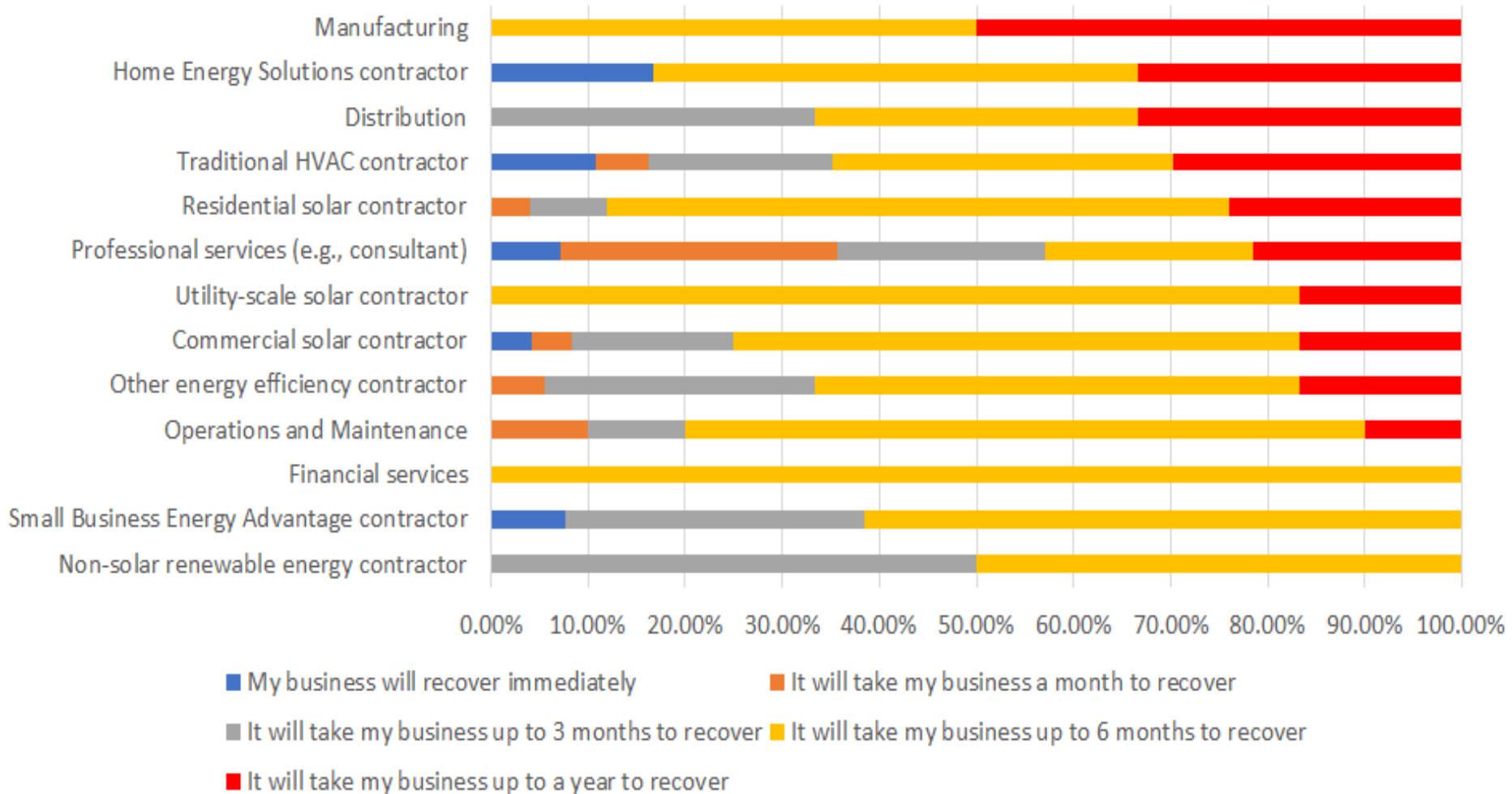
How has your business been impacted by COVID-19 in terms of its employees? (check all that apply)



Recovery Timeline is Long

6-12 Month Process

How many months after the "stay at home" order is lifted will it take for your business to recover?



Recovery Efforts Overview

- ✓ 1. **Federal Assistance** – continue to support connecting clean energy contractors to local community banks and credit unions to apply for PPP assistance
- ✓ 2. **Access to PPE** – continue to support awareness raising about access to PPE (e.g., CBIA and CONNSTEP – surgical masks and exchange)...and looking to provide more education on “best practice” procedures for onsite use of PPE at customer location
- ✓ 3. **Customer Demand** – (1) sought extensions through PURA on ZREC, LREC, and SCEF timetables, and (2) relaunching Energy on the Line program for grants to manufacturers for financing C-PACE projects
- ✓ 4. **Project Delays** – requested DTSD extension for existing ZREC contracts from PURA in anticipation of project delays anticipated by COVID-19
- ✓ 5. **Smart-E Loan IRB** – supporting 2.99% special offer of heat pumps + weatherization, battery storage, and EV chargers to increase customer demand for the installation of more clean energy measures – **launch on July 1, 2020**

Recovery Efforts

Overview (cont'd)

- ✓ 6. **HES Business Resumption** – May 11th training for vendor management on H & S guidelines that had been developed by an outside consultant for four states, including Connecticut. The guidelines are considered minimum requirements. Vendors will need to comply with state-specific protocols. DEEP issued opportunity for comments for H&S Protocols by 5/28/20.
- ✓ 7. **HES Workforce Training** – May 22, launched worker self-serve training and certification on the H&S guidelines. Enhanced guidelines for customer contact work scheduled for June 11.
- ✓ 8. **Virtual Pre-Assessments** – leverage HES vendors to offer no cost virtual pre-assessments to customers.
- ✓ 9. **Rebate Processing** – continued to process HES rebate applications submitted during the in-home assessment suspension.
- ✓ 10. **HES** – \$0 co-pay from the customer for visits scheduled prior to December 31.

Recovery Efforts

Overview (cont'd)

- ☑ **11. Insulation** – once it is safe to resume in-home services, there is a (1) “Ramp-up Incentive” to \$2.20/ft² for attic/wall and basement/garage insulation designed to cover up to 100% of an average customer’s contribution through the end of 2020 with (2) additional financing under HES Micro Loan (i.e., reducing minimum loan to \$500 and increasing access to both HES and HES-IE participants).
- ☑ **12. Heat Pumps** – once it is safe to resume in-home services, increase in ASHP incentive from \$250/ton to \$500/ton (and \$1,000/ton for electric resistance heating with HES Assessment) and GSHP incentive capacity from 3 to 5 tons for \$750/ton incentive through the end of 2020.
- ☑ **13. HES Heat Pump Pilot** –Fuel Optimization Rebates of \$1,250/ton for ASHP and \$1,500/ton GSHP for homes that heat with oil or propane with integrated control to existing unit rebates of up to \$500/unit with \$1,500 cap. HES required.

Recovery Efforts

Overview (cont'd)

- ✓ **14. SBEA Business Resumption** – support ongoing SBEA work using in-process project waiver; DEEP-issued opportunity for comments for H&S Protocols by 5/28/20
- ✓ **15. SBEA Workforce training** – launch complimentary online technical training platform for vendor staff
- ✓ **16. Virtual Pre-Assessments** – leverage SBEA vendors to offer no cost virtual audits to microbusinesses
- ✓ **17. SBEA Loans** – deferral of start of payment to six months after installation
- 18. Progress Payments** – utilities are developing a plan to provide progress payments when a certain percentage of work has been completed
- ✓ **19. Customer Demand** – support limited time offers to increase customer demand and support SBEA, BEA, and other C&I vendors

Recovery Efforts Overview (cont'd)



TIERED PROJECT INITIATIVE	2020 Plan Incentives			
	Greater of	Plus	Not to Exceed	
	per kWh	per kW	per CCF	Project Cap
TOTAL COMPREHENSIVE INCENTIVE				
Three or more End Uses	\$0.65	\$1000/ summer peak	\$6	65% of Installed Cost
MULTI END USE OR EMS				
Minimum two End Uses	\$0.50	\$1000/ summer peak	\$5	50% of Installed Cost
SINGLE NON LIGHTING END USE				
Minimum one non-lighting End Use	\$0.40	\$1000/ summer peak	\$4	40% Of Installed Cost

End use is defined as Gas or Electric, impacting Heating; Cooling; Lighting; Process; Domestic Water Heating; Refrigeration; Motors and Drives

DEEP COVID -19			
Greater of	Plus	Not to Exceed	
per kWh	per kW	per CCF	Project Cap
\$0.75	\$1000/ summer peak	\$6.5	75%
\$0.60	\$1000/ summer peak	\$5.5	60%
\$0.50	\$1000/ summer peak	\$4.5	50%

DEEP provides additional flexibility to utilities for applying an 80% cap to address particular concerns, such as distressed areas and congestion

REFERENCES

- DEEP "Notice of Opportunity for Written Comments – Health and Safety Protocols" (May 13, 2020)
- DEEP "Approval of Proposed Changes to C&I programs Under the 2020 Annual Update of the 2019-2021 Conservation and Load Management Plan" (May 22, 2020)

Recovery Efforts Overview (cont'd)



LIGHTING MEASURES

	Greater of	Plus	Not to Exceed
	per kWh	per kW	Project Cap
HIGH PERFORMANCE LIGHTING			
LED Fixtures with Networked Lighting Controls System	\$0.65	\$1000/summer peak	NA
			65% of Installed Cost
ENHANCED PERFORMANCE LIGHTING			
LED Lighting with Luminaire Level Lighting Controls or Wirelessly Accessible	\$0.45	\$1000/summer peak	NA
			45% of Installed Cost
STANDARD LIGHTING			
	\$0.25	\$1000/summer peak	NA
			25% of Installed Cost

Greater of	Plus	Not to Exceed
per kWh	per kW	Project Cap

\$0.75	\$1000/summer peak	NA
		75%

\$0.55	\$1000/summer peak	NA
		60%

\$0.40	\$1000/summer peak	NA
		45%

applying an 80% cap to address particular concerns, such as distressed areas and congestion

REFERENCES

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- DEEP "Approval of Proposed Changes to C&I programs Under the 2020 Annual Update of the 2019-2021 Conservation and Load Management Plan" (May 22, 2020)

Follow-Up Survey (3rd or 4th Week of June)

Connecticut Clean Energy Industry Survey

This survey was put together by 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.



The purpose of this survey is to follow-up from a prior survey that assessed the impacts of COVID-19 on Connecticut's clean energy industry, and to continue to increase our understanding of the challenges industry is facing and what can be done to address COVID-19 through incentives, demand creation, public policies, and other mechanisms



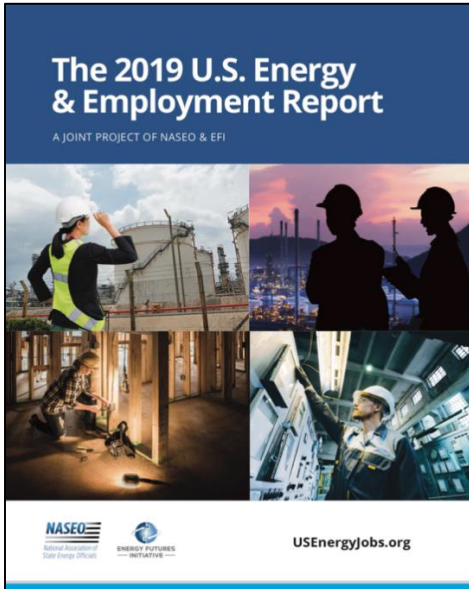


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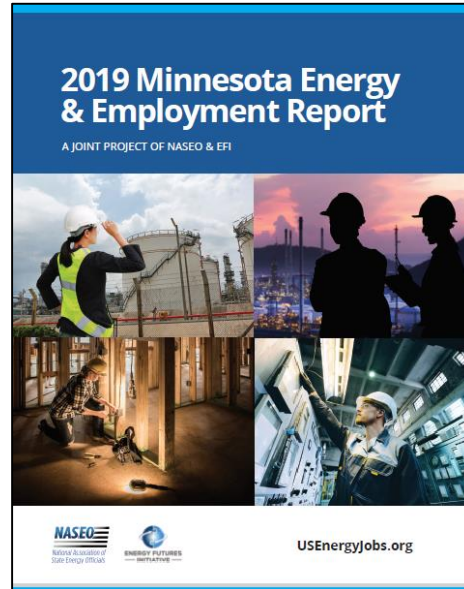
Agenda Item #5

Energy Jobs Report – Update

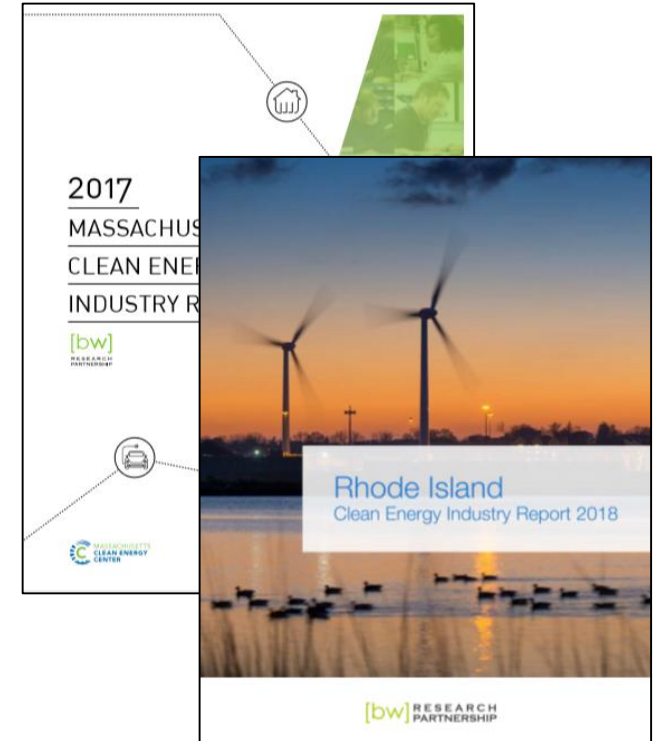
Job Study Decision



US Government Report
\$0 Investment



Template State Report
\$15,000 Investment



Customized State Report
\$40,000 Investment

Modelling “Best Practice”

Massachusetts Clean Energy Industry Report



Figure Samples

Employment vs. FTE's (2015-2019)

Figure 1. Clean Energy Employment In Connecticut, 2015-2020 Projected

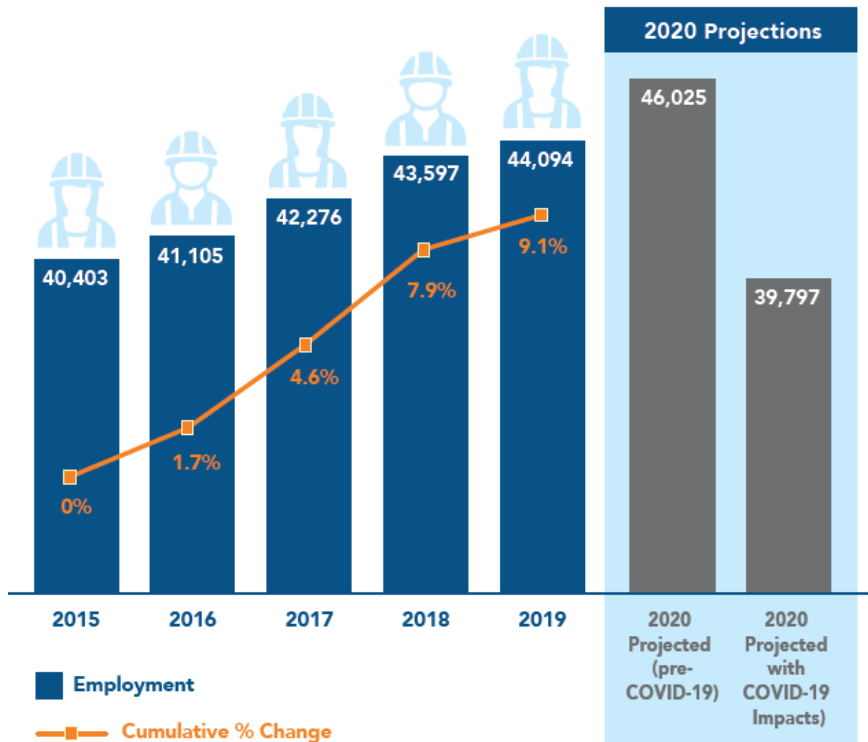
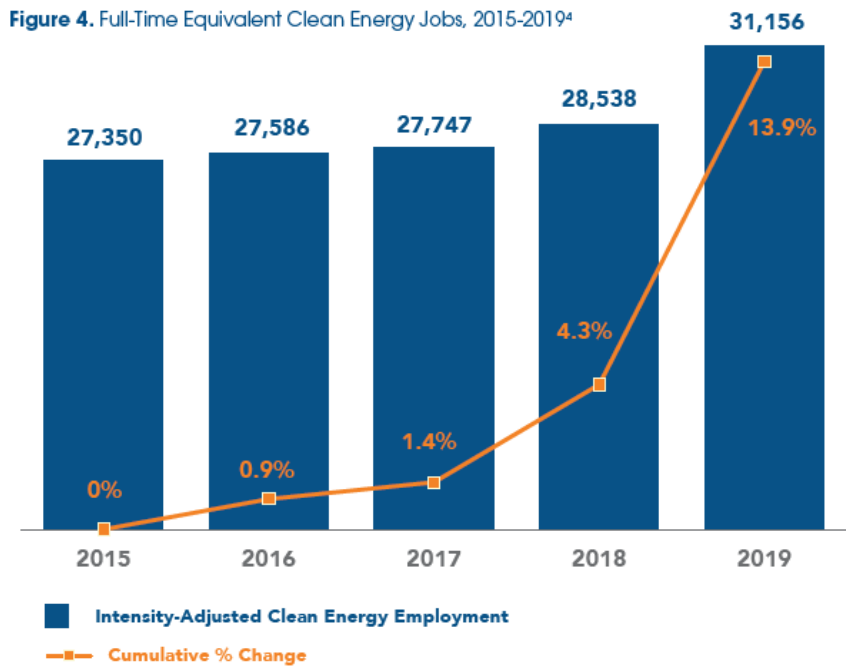
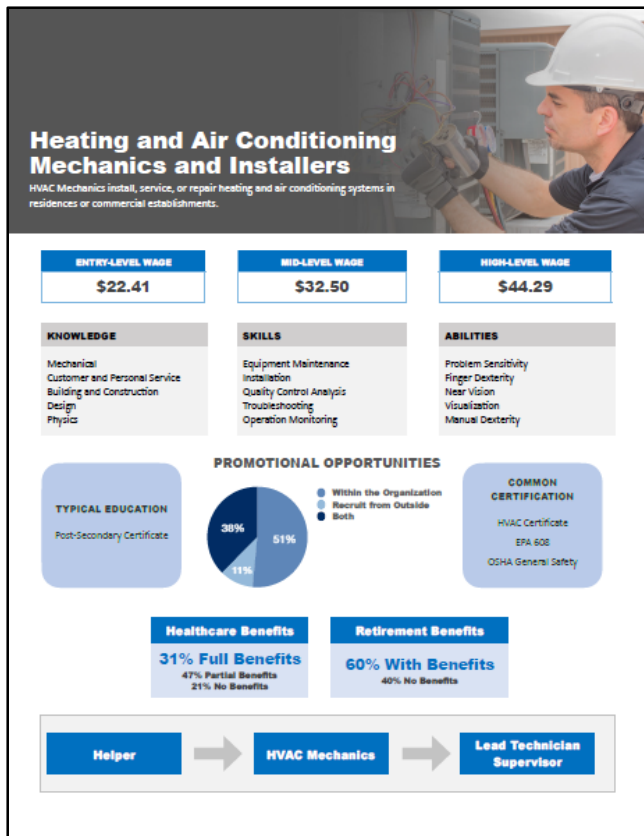


Figure 4. Full-Time Equivalent Clean Energy Jobs, 2015-2019*



Collaboration with DOL-OWC

Per Sections 19 and 20 of Public Act 19-35



- **PA 19-35** – “An Act Concerning a Green Economy and Environmental Protection”
- **Sections 19-20** – requires OWC to establish a career ladder for jobs in the green technology industry, including information on education and wages with postings on website
- Will link our Clean Energy Industry Report to the co-branded (i.e., DOL-OWC and EnergizeCT) ten (10) career profiles fact sheets to their website along with listing of various training programs

Job Study Needs

- **Additional Scope of Work** – added the following addition to our work (i.e., \$7,940 additional – total of \$53,000 for study):
 - COVID-19 Monthly Memos (1-Year)
 - Job and FTE Updates (2015-2016)
 - Occupational Career Profiles (i.e., 10 profiles)
 - Assistance with DOL on Occupational Career Profiles
- **Timeline** – seeking to complete by the end of June
- **Needs** – in order to get from here to there, we need the following:
 - Completion of Letter from the Chair of the Joint Committee
 - Additional high resolution photos
 - Completion of “Call-Outs” (i.e., including high resolution photos with descriptions) requested by Green Bank on April 4, 2020, and linkage with DOL-OWC website
 - Staff support to make final decisions together – currently Green Bank staff (i.e., Bryan and Rudy) are making the editing decisions



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Agenda Item #6

C&LM Plan and CGB Comprehensive Plan Discussion

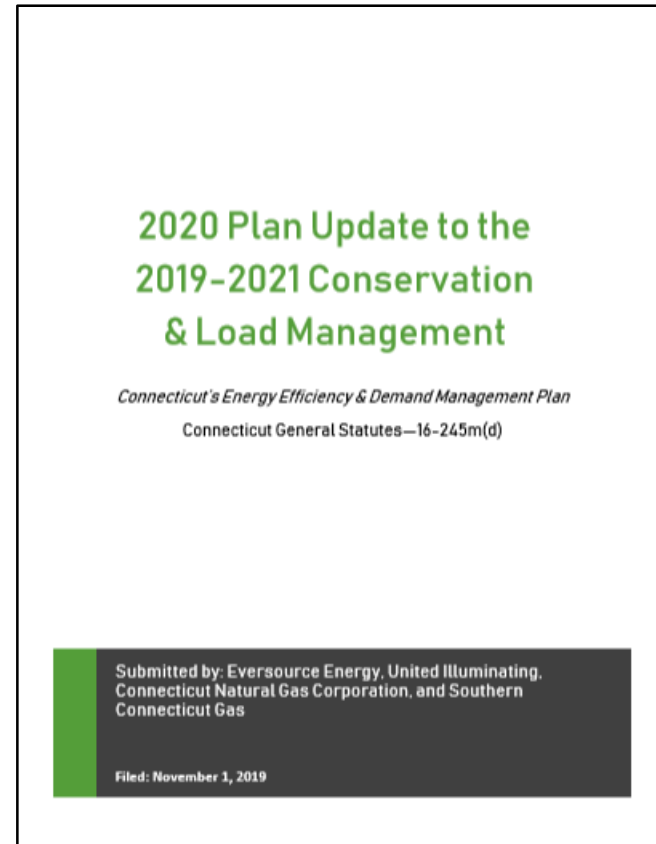
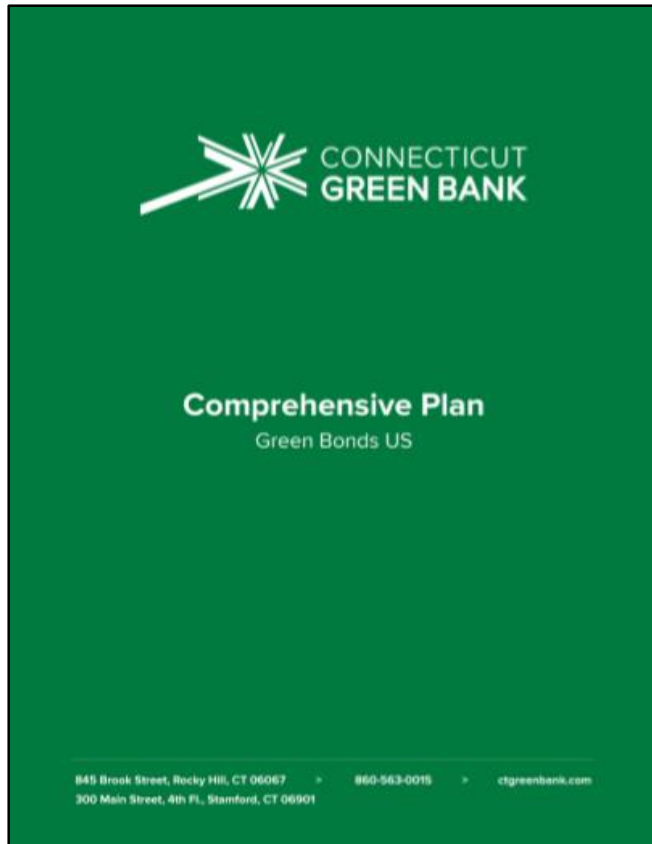
2020 Joint Committee Agenda Items

Revised with C&LMP and CGB Planning Cycles

- **March 18, 2020** – input into CGB FY 2021 Comprehensive Plan and input into CY 2021 C&LMP
- **June 17, 2020** – input into CY 2021 C&LMP
- **September 16, 2020** – debrief on 2020 legislative session
- **December 16, 2020** – plans for 2021 legislative session and input into CGB FY 2022 Comprehensive Plan (Revisions)

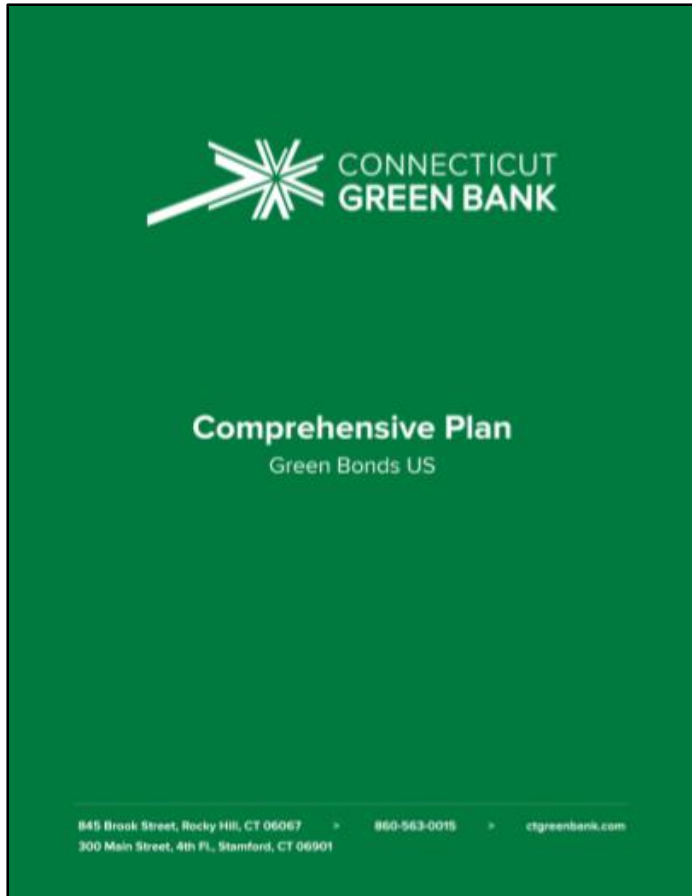
Other Joint Committee agenda items to include based on planning and legislative cycles?

Plans Discussion



Connecticut Green Bank

Comprehensive Plan – Green Bonds US



- Setting new targets for FY 2021 – challenges resulting from COVID-19
- Various “clean ups” (e.g., footnotes, links, numerical updates)
- Program alignment with operations (e.g., Smart-E Loan in Incentive Programs vs. Financing Programs)
- Inclusion of GHG emission reductions in targets consistent with mission statement and national EV carbon offset initiative
- Continuation of battery storage efforts from EEP Program (i.e., Docket No. 18-12-35) to Equitable Modern Grid (i.e., Docket No. 17-12-03) with respect to residential solar PV
- Inclusive of Green Bond Framework supporting Green Liberty Bonds issuance

Connecticut Green Bank

FY 2021 Targets (DRAFT)

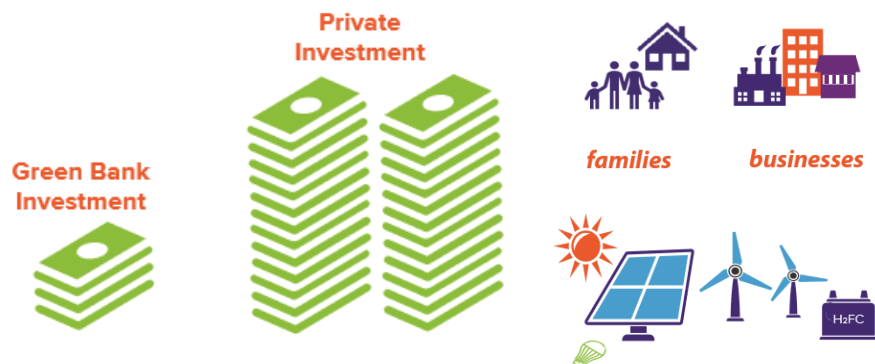


Incentive Programs

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (MW)
RSIP	2,824-4,706	\$85.9-\$143.2	24.0-40.0
Solar for All	177-304	\$4.3-\$7.4	1.2-2.0
Battery Storage	0-400	\$0.0-\$3.5	0-2
Smart-E Loan	270-540	\$3.6-\$7.1	-
Total	3,094-5,646	\$89.5-\$153.8	24-42

Financing Programs

Products / Projects	Projects	Total Investment (\$MM's)	Installed Capacity (MW)
C-PACE	33-48	\$15.2-\$23.3	5.3-7.1
Green Bank Solar PPA	30-58	\$4.0-\$6.8	6.2-11.7
SBEA	1,203	\$20.4	-
Multifamily Predev	TBD	TBD	TBD
Multifamily Term	TBD	TBD	TBD
Multifamily H&S	TBD	TBD	TBD
Strategic Investments	TBD	TBD	TBD
Total	TBD	TBD	TBD



In FY 2021, the Connecticut Green Bank will invest [\$X] MM in incentive and financing programs to attract [\$Y] MM in private investment to support [X] projects, [X] MW of clean energy deployment, and reduce [X] MMTCO₂

Green Liberty Bonds



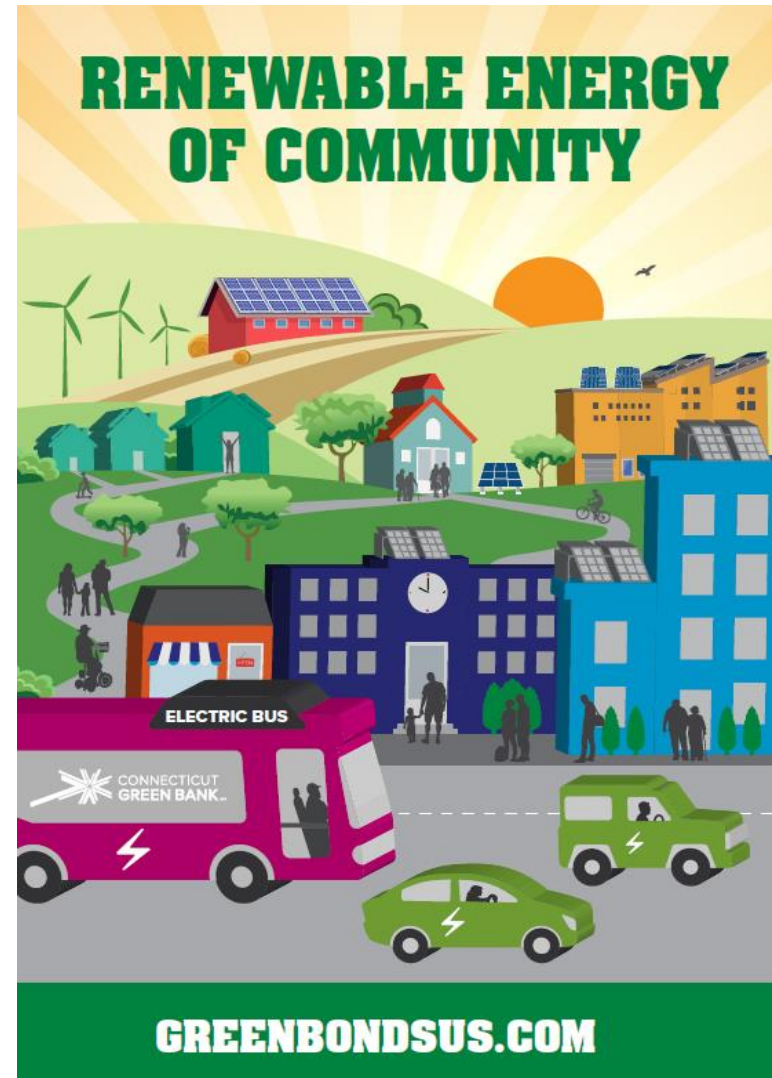
Celebrating the 50th Anniversary of Earth Day



Green Liberty Bond

Definition – Specific Class of Green Bond

- **Use of Proceeds** – use of proceeds from the bond are invested to *combat climate change*
- **Retail Accessible** – bonds available to purchase by *everyday citizens* (vs. institutional investors) at small denominations (i.e., ≤\$1,000)
- **Certified and Verified** – independently certified (e.g., Climate Bonds Initiative, Green Bond Principles, etc.) as a climate bond or green bond for *consumer protection*

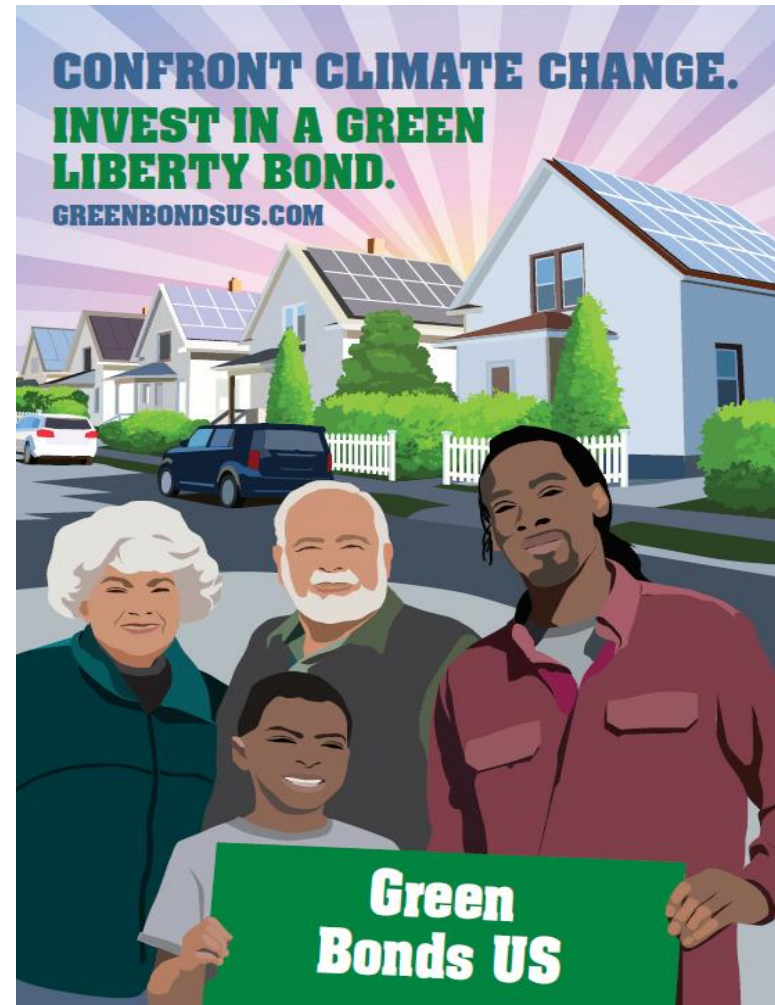


Green Liberty Bond

Take Action – “Save for the Planet”



1. **Get Notified** – sign-up at www.greenlibertybonds.com to learn about the bonds and receive updates
2. **Find a Broker** – open-up a brokerage account to be able to place an order to buy a bond by contacting Michael LeClair at (203) 772-7200 or michael.leclair@stifel.com
3. **Buy a Bond** – once all of the details about the bond offering are complete, and the market adjusts to COVID-19, then buy a \$1,000 Green Liberty Bond



Connecticut Energy Efficiency Fund Conservation and Load Management Plan

2020 Plan Update to the 2019-2021 Conservation & Load Management

Connecticut's Energy Efficiency & Demand Management Plan
Connecticut General Statutes—16-245m(d)

Submitted by: Eversource Energy, United Illuminating,
Connecticut Natural Gas Corporation, and Southern
Connecticut Gas

Filed: November 1, 2019

- Focus on changes and enhancements to existing 2019-2021 Three-Year Plan
- Consideration of uncertainty in budgets, goals, PMIs, and program implementation due to Covid-19
- Continued growth in demand response activities
- Possible clarification of C&LM role in supporting fuel switching
- Continued assessments of potentially underserved customer segments and development of targeted approaches, as warranted.
- Emphasis on work force development



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Agenda Item #7

Plans for Special Summer 2020 Legislative Session



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Agenda Item #8

Other Business

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 #9

Adjourn



Draft MINUTES

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

Albert Pope Board Room
845 Brook Street, Rocky Hill, CT

Wednesday, December 18, 2019
1:00-3:00 p.m.

In Attendance

Voting Members: Eric Brown, Mike Li (phone), John Harrity, and Taren O'Connor

Non-Voting Members: Steve Bruno, Bryan Garcia, Bert Hunter (phone), and Will Riddle

Others: Craig Diamond (phone), Mackey Dykes, Brian Farnen (phone), George Lawrence (phone), Selya Price, Madeline Priest, Glenn Reed (phone), Ariel Schneider, Mike Trahan, and from BW Research: Phil Jordan, Colby _____, Sarah Layman (phone)

1. Call to Order

Bryan Garcia called the meeting to order at 1:04 pm.

2. Public Comments

Mike Trahan with Solar CT stated that as representing residential contractors, they wanted to express strong interest in solar storage options. He reminded the Joint Committee of the interest in solar storage and urged to continue discussions.

- Eric stated he was more familiar commercial storage options but is unfamiliar with those available residentially. Mike clarified there were early adopters and some contractors in Connecticut are stocking residential batteries and are meeting regularly to discuss their capabilities, as residents are highly interested. There is a wide range of reasons consumers would benefit and stimulating the market would further that. He also stated that the price for residential batteries is dropping faster than the price of modules did, so consumers may begin looking more into options as the price continues to drop. He reiterated the continued interest on behalf of contractors and their customers.
- Bryan Garcia clarified that there are about 200 homes with solar batteries that have come through the contractors involved in the RSIP, but there are no incentives for purchasing one. Currently it has been set to the side as an option being discussed in the Equitable Grid Modernization docket. Mike Trahan stated there is benefits to all rate payers with batteries, and it was further clarified that the solar storage could do that by returning stored energy to the system during times of higher peak demand.

- Eric Brown commented that it is tricky in that there must be enough payback for the user to invest in a battery in the first place and questioned how to qualify the value of the resiliency. Battery viability, resiliency, and incentives were briefly discussed further.
3. Review and approval of Meeting Minutes for April 17, 2019 and July 17, 2019 meeting.

Resolution #1

Motion to approve the meeting minutes for April 17,2019 and July 17, 2019.

- Eric Brown briefly spoke about new docket 17-12-03 while the previous minutes were reviewed.
 - John Harray motioned to approve minutes, Eric Brown seconded. **The motion to approve the meeting minutes was voted on and approved.** There were none opposed but Taren abstained from voting.
4. Energy Jobs Report
- Bryan Garcia introduced Phil Jordan, Colby, and Sarah Layman from BW Research. He summarized the previous meeting discussions and decisions to move forward with a more advanced report focused on Connecticut. BW Research will be producing a report by April 2020 and Bryan stated that he sent a draft to the Committee of the data and scope of work and that the Green Bank subsequently engaged in a contract, including with the utility partners. Bryan believes there will be better perspective in March at the first Joint Committee meeting of 2020.
 - Eric Brown advised that the report include information to help explain the purpose better to policy makers, and possibly expand the scope to explain impact. He stated that he doesn't want it to be just a lobbying tool.
 - Bryan explained that the report will be mostly data, and that BW Research can advise on how to explain and frame the data.
 - Phil Jordan introduced his team and company background. BW Research has been working with this type of data collection for last 12 years with states around the country. Two years ago, the Energies Future Initiative raised funds to replicate the study by philanthropic and state agencies after the Energy Research budget changed in 2017. The data collected would be for Connecticut as well as neighboring states and used alongside the 2020 Energy and Employment Report which will be released in the spring. Phil stated that they focus on quantitative and qualitative direct feedback which mirrors the data setup of state agencies.
 - Phil clarified that BW Research produces data that identifies gaps and opportunities. It does not give advice, but instead focuses on the framework of what is already there. He stated that many clients use data to inform policy but also for education and training programs as well as economic development. He wants the Joint Committee to understand the different intended uses so they can collect data for presentation to the right audiences.
 - Phil clarified that BW Research builds reports off data in conjunction with data from the BLS Quarterly Census on Employment and Wages. Their reports look at all energy jobs, not just clean energy jobs.
 - Eric Brown asked if it would include manufacturing of fuel cells, etc. Phil said yes and clarified that BW Research uses two separate criteria that overlap to produce the most data. As an example they would look at if a company is

focused in Research & Development or Manufacturing, but then confirm the data against the census information to be sure it is categorized correctly and will allow for the most accurate reporting.

- Phil stated the sectors listed in the Technology List provided are the broad sectors, but it doesn't break down differences such as solar versus wind, or the various ways to improve home energy efficiency, for example.
- John Harrity asked why railway technology is not included. Phil clarified that public transport is not included and neither are certain other travel methods. When asked about bus drivers being included in a previous national study, the answer was yes, and the funding was abruptly ended. At the time, including public transportation jobs was viewed negatively and it has been the trend carried forward ever since. He also stated it is easier and possible to list public transport jobs separately as a highlight. In regard to rails, Phil clarified that transportation efficiency was heavily focused on light-weighting of vehicles and petroleum based fuel economy. Historically, rails just were not included, but stated they would not be opposed to including in the future and refocus on when perspectives shift more in their favor.
 - Bryan stated in the context of fighting increased climate change, more public transportation and railways are good and those topics be flagged for discussion on future reports.
- Phil continued that there are 73 technologies they have collected data on historically which are on the Technology List provided. Each of them is modular to collect aggregation data and uses NAICS codes, which are a common set of industry classifications across the US, Canada, and Mexico. The codes allow for better state-by-state analysis. He stated that people tend to be focused on the number of clean energy workers, as it is viewed as the most news-worthy number, but BW Research focuses more on data across the board, and so they search for the best people to survey to get the most data to examine. He stated they would rather survey someone who will talk to them longer to gather more comprehensive data than more people for quick numbers.
 - The survey determines employment numbers, hiring expectations for the next 12 months, hiring difficulty by technology and industrial classification, high demand jobs and skill gaps, workforce demographics by race, ethnicity, gender, union status, age, and veteran's status, and geographic location by state, county, congressional and legislative districts, and the MSA of each technology and industrial classifications. Phil stated there are margins of error that resolve in less precision in smaller areas, but the survey does clearly show those concentrations and areas of focus.
- Phil clarified the definitions for the Joint Committee to keep in mind while data collection is taking place and during the analysis process.
 - The study is an industrial, not occupational, study. That means that the company must be focused on clean energy and that certain areas of the market are not included. For example, employees that work for a hospital, even if the hospital is utilizing clean energy practices. Because the focus of the hospital is not clean energy, it would be set aside, and historically including such groups and companies has led to poor reception of the report. In regard to legal and accounting firms, they may be included in part if the company has a specific division focused on clean energy, but it should be specific so the data is the best received.
 - There is no standard def of "clean energy" on a state, national, or international level.
 - There are different thresholds of work. He stated that they must consider those thresholds of people's work which is related to clean energy. Not every

- installer only installs clean energy products, and not every manufacturer only produces one product.
 - There are multiple audiences. Phil stated the challenge is to balance the focus of the report to best benefit the intended audiences. He suggested being careful in nuancing the information so it is used best. There are the number of jobs and the different bottlenecks for opportunities, education, training, and equity and all that allows it to be useful to the most people without being too specific.
- Phil stated that BW Research does not put a value statement on the data, as it is up to the Joint Committee to determine.
- Phil gave a timeline update. He stated the data has been collected, cleaned, and BW Research is now in process of doing national analytical runs. In the next 2 weeks they will be producing the Connecticut data, so it should be ready by early January. The second piece is a landscape analysis for education providers and starting to collect information from partners of the Green Bank about other utilities and contractor training. He stated they will be circulating the preliminary research in the next couple weeks so that others can review it and make suggestions of other data to include which may have been missed. That process will be ongoing through January. The third piece is reviewing spatial analysis and unemployment throughout Connecticut. The final piece is looking at the data's potential based on "multipliers" that exist. He stated that not all industries are created equal so looking at how different areas of industry are equitable versus others is important.
 - Once all the data is collected, reviewed, recollected, and analyzed, a first draft of comprehensive data would be released in early March.
 - Bryan stated the Green Bank is in the contract with BW Research, but are working with United Illuminating and Eversource to support the whole report. He stated it is no trouble to involve and keep those committee members informed of the progress and can coordinate so the best results are made.
- Eric Brown asked if there any distinctions between jobs tied to specific programs, like those funded through the Efficiency Fund or Green Bank, versus those supported by other means. Phil stated that the best option would be to align the segments of the CE Economy by those supported directly by the noted activities. He clarified that there is so much activity that happens outside of programs but is relevant, such as a new home built to energy efficient standards outside of involvement with a program, and so that makes it difficult to create an estimate that accurately shows direct involvement from specific, noted programs. He stated the "good news" is if there is any fluctuation in a program's results, by not claiming credit in how the data is presented, there is less push back or negative views back to the Green Bank or Joint Committee because the reported numbers changed or lowered.
 - Eric Brown asked that direct involvement be acknowledged somewhat, but does not want to get too detailed with the analysis of it. He clarified that people may come out to question the numbers from either the perspective of nit-picking or looking for more detail. Phil suggested that the report include an example statement of "These are the sectors that are supported by the Green Bank and Joint Committee activities" and then provide a list without getting too deep into numbers.
- John Harry asked if the report will include training happening in the state currently. Phil said yes. John clarified in the past there was difficulty in determining what is happening now and that the data was very sparse. Phil stated that BW Research acknowledged that not all the data is included and do not claim to be 100% comprehensive, but it will invite other programs that may not be included to contact them so that the data can be updated in the future. He clarified that the information is

- presented as a more general gap analysis for employer needs instead of the nitty gritty as to who is or is not involved.
- Phil stated that people generally know what renewable energy is, but there are a couple other areas worth discussing. One example is nuclear energy, which is typically considered Advanced Energy instead of Clean Energy. The Joint Committee is welcome to include it in their definition, but Connecticut would be the only state in the Northeast to do so. He reiterated that each state defines “clean energy” differently based on the Technology List, but there are trends as people reconsider the different types. Other areas to discuss would be Bioenergy/Biomass Generation (#5 on the list), Traditional Hydroelectric Generation (#7), Nuclear Generation (#9), and Natural Gas Generation (#12). He stated Massachusetts only includes Low-Impact Hydroelectric Generation but other states such as New York include all hydroelectric, and that natural gas generation is another type that is typically considered Advanced Energy. Those key decisions will lead to other discussions as to other fuels that should be discussed, such as corn ethanol (#56).
 - John Harrity asked about steam loops. Phil clarified that steam loops have typically been classified under Combined Heat and Power (#13).
 - Phil also highlighted discussing Hybrid Electric Vehicles (#63). He stated many states are moving to include Plug-In Hybrid Vehicles (#64) only and doing away with incentives to older style hybrid vehicles.
 - Bryan Garcia asked if rails be considered in this context, given John’s point about rail inclusion earlier. Phil suggested possibly next year, but it can’t actively include it now because it wasn’t in the initial survey. He also stated his doubt that mass transit would be viewed positively because of the outlook on the national level.
 - Phil clarified that BW Research does not need a decision today as to what will be included or not. He asked for any specific questions why something would be included or not, and if it comes up after the meeting to contact him.
 - Bryan requested a draft table of where each item falls in relation to other states and with information as to how much focus each item has, to be sent by email and reviewed by phone. Steve Bruno asked if BW Research has the data for how many jobs are in each sector. Phil stated they will in the next couple weeks. Bryan stated he would prefer to include the job number breakdown per sector.
 - Eric stated the idea of the table, to better look at and understand the sectors, would be very useful, and asked Phil and BW Research to let the Joint Committee know what they need to make it.
 - Will Riddle asked if the Joint Committee is considering only the ones it supports or all clean energy jobs. He stated it seems that the members are on different pages as to what to include and focus on. He stated that he tends to only want to include what the Joint Committee supports.
 - Andy Brydges stated that he disagrees. He discussed his experience creating a similar analysis in Massachusetts and that including them all can be beneficial in a wholistic sense. As he had previously gone through the process, that group realized there were more companies involved because of their levels of focus which was unknown before.
 - Eric Brown asked if that group had the ability to identify those individual companies without including every one that is of the similar type. For example, a packaging manufacturer of something directly related to energy efficiency instead of all packaging manufacturers who happen to use energy efficient elements in their business. Andy said yes. Bryan stated the need to view the data at a macro level and unify

the efforts instead of solely focusing on what the Green Bank and Joint Committee support directly. Eric stated the need to make the report as defensible as possible.

- Phil summarized because the report is not a lobbying document, that it is just tracking changes in the workforce, that already makes it more defensible than if presented with different language. He stated the key is to be clear with the assumptions and definitions within it.
 - Andy Brydges stated that the report should present the data as a deeper dive to info people may already know, which will be favorable overall.

5. 2020 Regular Schedule of Meetings

a. Realigning Strategic Planning and Legislative Session with the Regular Schedule of Meetings

- Bryan clarified that the Green Bank looked at the C&LMP and CGB planning cycles and accounted for them to adjust the quarterly schedule to best tackle the information presented. The Joint Committee meeting dates have been moved to a month prior from previously scheduled, to the 2020 schedule of:
 - March 18 at DEEP in Hartford
 - June 17 at Eversource in Berlin
 - Sept 16 at the Green Bank in Rocky Hill
 - Dec 16 at United Illuminating in Orange
 - All meetings are scheduled for 1:30 pm – 3:30 pm.
- John motioned to approve the 2020 meeting schedule, Taren seconded. There were no questions on locations or dates. **The schedule was voted on and approved unanimously.** There were none opposed and no abstentions.
- Taren had to leave after the vote on the meeting schedule.

6. Input to FY 2020 Connecticut Green Bank Annual Plan (Revisions)

- Bryan summarized the Green Bank's future focus on "Green Bank 2.0" in order to scale up the investment in the green economy. The Green Bank Board discussed and approved the mission statement changes. Bryan explained the specifics of the language changes to the mission statement and the 3 goals of the Green Bank as well as the new vision statement. Overall, the intent is to imbue the mission with a more encompassing scope and to include the emotional impact within the vision statement.
- Bryan summarized the Green Bank organizational structure, funding structure, and relationship to IPC. He also summarized the targets for Fiscal Year 2020 for programs, investments, and installed capacity.
 - Steve Bruno asked about the RSIP incentives. Bryan explained it will end approximately Q3 2020. He stated the Green Bank is focusing now on the transition after RSIP ends and net metering becomes more prominent before the tariff comes into effect. He stated that what the Green Bank is frequently hearing are questions about HES projects when RSIP ends, because the RSIP includes an energy audit requirement, and that the Green Bank and contractors are already discussing what will happen.

- Bryan invited comments and questions of the information so that the Green Bank can take it into consideration and be as comprehensive as possible. He asked to send any comments or questions by the first week of January.

7. Plans for the 2020 Legislative Session

- Donna Wells explained there are no plans for the 2020 legislative session that are currently ready to be announced.
- Bryan Garcia stated the Green Bank has a technical fix for the auditors and that the Green Bank is looking to include EV infrastructure in CPACE. He clarified that they are looking to exempt certain infrastructure so homeowners can finance it through CPACE.

8. Other Business

- a. Update – Small Business Energy Advantage: Recent Amendments to Expand Opportunities for State and Municipal Facilities
 - Steve Bruno and Mackey Dykes summarized the SBEA updates and amendments. Mackey stated that in last month, an amendment was executed between Green Bank and Eversource, and Amalgamated Bank to expand terms of SBEA financing. The cap is raised from \$500,000 to \$1,000,000. Any individual loan can now be up to \$1,000,000 and aggregate loans of \$1,000,000. The State can do individual loans up to \$1,000,000 and has no aggregate loan limit. The term was extended from 4 years to 7 years. Mackey also stated that the Green Bank is having a broader conversation with the State as to financing energy efficiency projects. In the course of the conversations with State Comptroller, State Agencies, etc, it became clear that the State was taking on debt. Now they are working with Steve Bruno at Eversource to make sure all the debt is captured for reporting purposes. He stated that on the agency side there will also be a more comprehensive approval process implemented.
 - Steve Bruno stated that everything has been positive so far. There is a process in place to update people on the project timeline, which in turn increases the limit to do more state projects including finalizing next round of master agreements and working to improve reporting.
 - Andy Brydges asked if the agreement with SBEA is to renew as well as expand it. Steve clarified they want to capture more projects from the State including, hopefully, larger scale projects. Having a report to provide to the Treasurer's Office with updates seems to be working well, and the staff at the Treasurer's Office are excited to have a tool to use.
 - Mackey Dykes stated the Green Bank has partnership with the MIF fund. Previously there was \$800,000 to give to manufacturers who did a CPACE project, but it expired at end of 2018. There have been discussions on how to handle the leftover funds, and the Green Bank was able to get an extension of the program to spend remaining money by the end of the 2020 calendar year.
 - Bryan Garcia summarized Docket 17-12-03, which was mentioned earlier. The Equitable Modern Grid currently addresses 6 areas and will research 5 more. He and other Joint Committee members expressed how impressed they each were by amount of policy done in short amount of time surrounding this docket.

- Bryan discussed Lonnie Reed's appointment as the Green Bank Board of Director's Chair and mentioned that Green Bank has other Governor appointments to fill. He also stated the need to assign a Green Bank member to the Joint Committee.
- Bryan summarized the Green Bonds US campaign plan. The public awareness campaign has already begun, and the launch of the purchase of = Green Bonds to support the SHREC Tranche 4 will begin on the 50th anniversary of Earth Day which is April 22, 2020.

b. Others

- Bryan Garcia mentioned it may be worthwhile to look again at the goals, structure, etc of the Joint Committee as the new administration begins next year. Eric Brown agreed on the need to re-evaluate and to provide value and context in what is done.
 - John Harranty stated regarding the legislative climate, there is a big desire to address the issues but there isn't necessarily a lot of expertise. Legislative staff are really looking for leadership and the best ideas. He stated if the Joint Committee can provide that, it is a great opportunity and help to them.
 - John stated that stakeholders are working with the Governor's Office to revamp the transportation plan and improve it. He stated the need to implement strategic transportation which goes hand in hand with climate change policy.

9. Adjourn

The meeting was motioned to adjourn by John Harranty and seconded by Eric Brown at 2:50 pm.

Respectfully Submitted,

Eric Brown, Chairperson

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Connecticut Clean Energy Industry Report



FPO

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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 EnergizeCT and Joint Committee

EnergizeCT

- EnergizeCT 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.

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

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**

31 million tons of NO_x, SO_x, and PM avoidance

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

Tax revenue of more than **\$76 billion generated**

¹ www.USEnergyJobs.org



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Eric Brown
Chair, Joint Committee

About the Partners

The Connecticut Green Bank is the nation's first green bank. Our 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.



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 Regional 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, creating just over 3,600 new jobs since 2015.
- 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 has already lost 6,228 jobs as of April 2020—an 14.1 percent decline—as a result of the COVID-19 fallout.¹

In the aftermath of the pandemic-induced recession, Connecticut will have an opportunity to capitalize on the previously strong clean energy job growth. While social distancing orders may continue through 2020, the clean energy industry is likely well-poised to see a more rapid comeback compared to other sectors of the economy. 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. As the national and statewide economies and labor markets recover, these types of support will be especially important for all sectors of the clean energy economy in Connecticut.

Figure 5. Covid-19 Job Losses By Technology Sector, April 2020

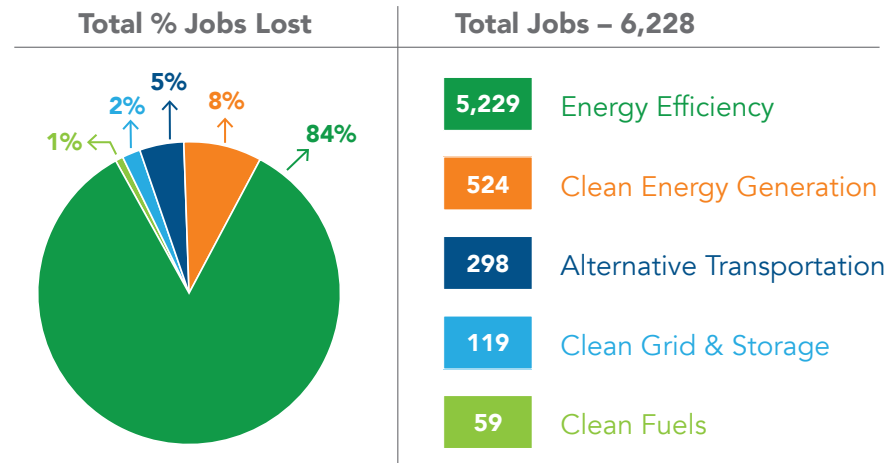
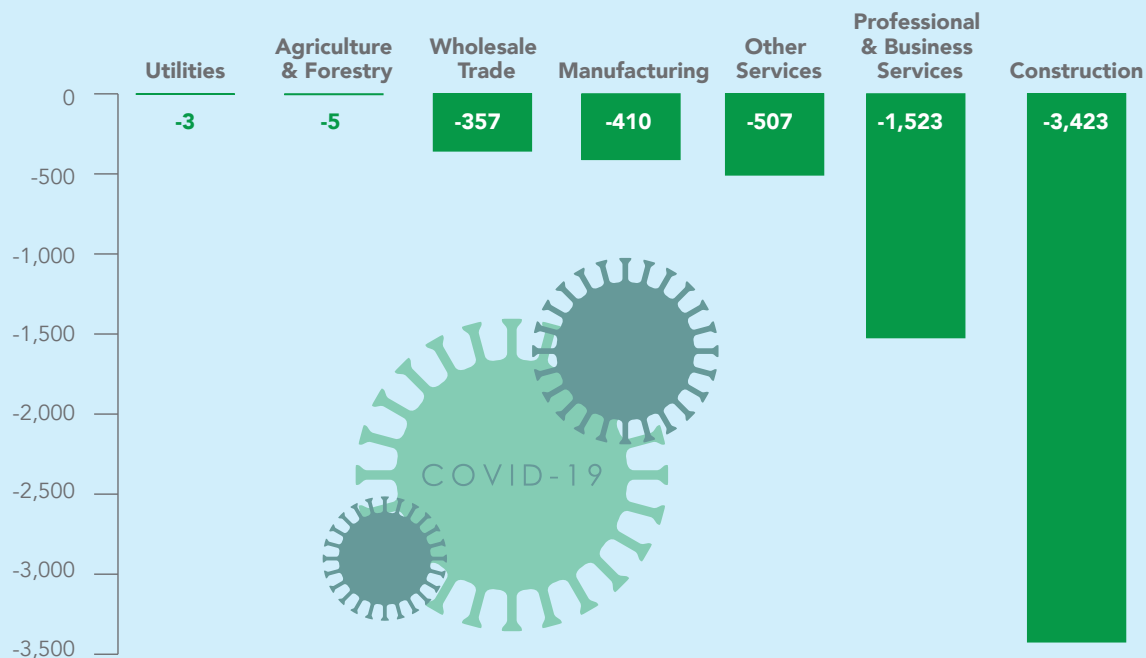


Figure 6. Covid-19 Job Losses By Value Chain Sector, March-April 2020



¹ Further analysis related to the COVID-19 pandemic's economic impacts can be found at <http://bwresearch.com/covid19>.



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 ranked 6th in ACEEE 2019 ranking of state energy efficiency policies and programs.



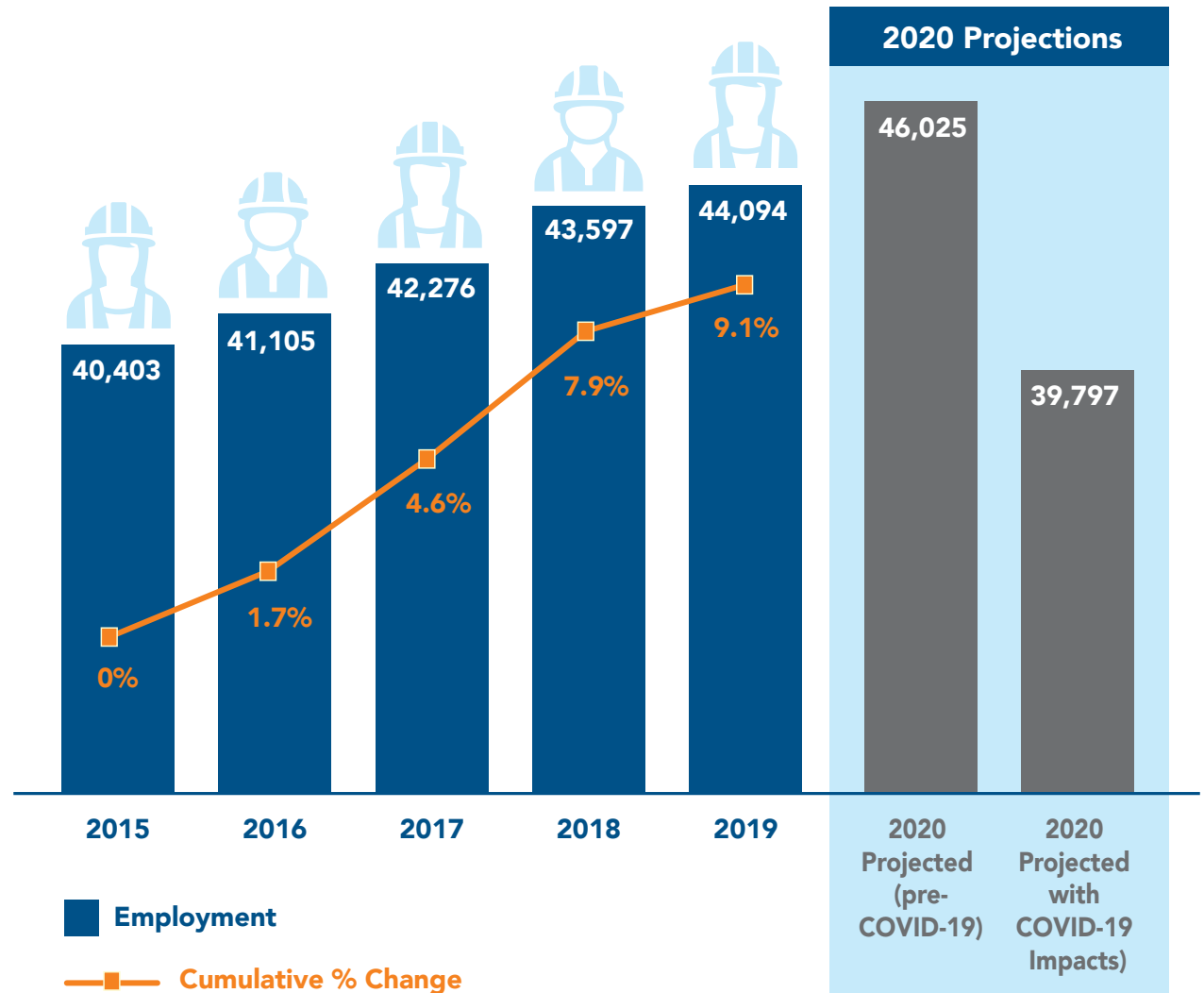


InSports Center, Trumbull, CT: Energy Upgrade to a 252 kW solar photovoltaic system; energy efficient lighting

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.

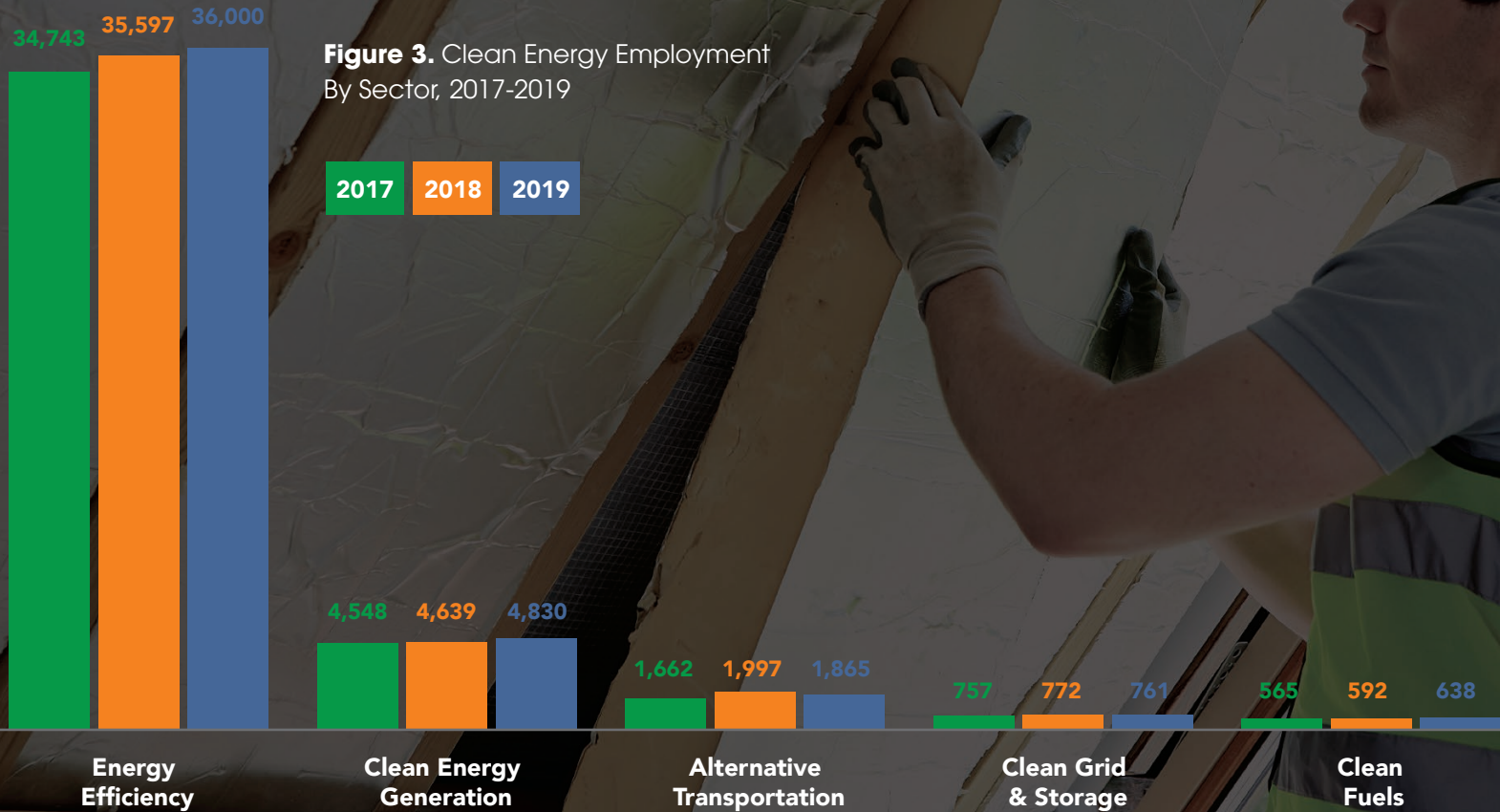
Figure 1. Clean Energy Employment In Connecticut, 2015-2020 Projected



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.



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.²

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

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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):

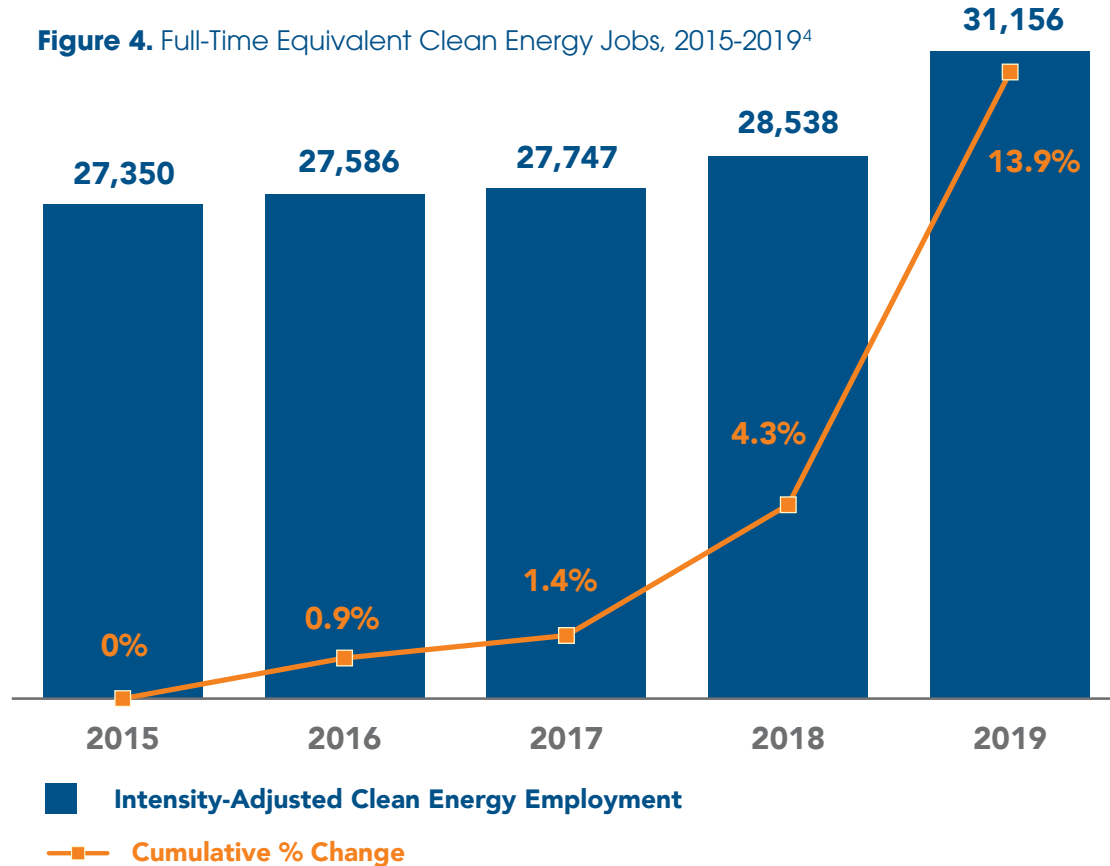
- Other Ethanol and Non-Woody Biomass (254.8 percent growth since 2017)
- Wind (158.7 percent growth)
- Woody Biomass (114.2 percent growth)
- Traditional Hydropower (108.5 percent growth)
- Bioenergy and Combined Heat and Power (49.8 percent growth)

² <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.

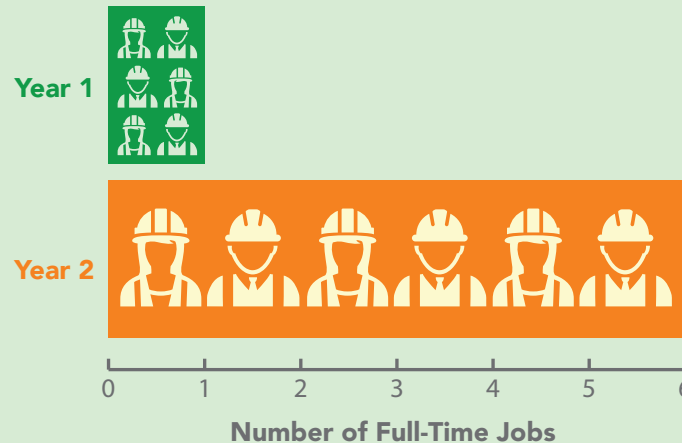
Intensity, or concentration, of clean energy work has been on the rise in Connecticut. In fact, full-time equivalent clean energy jobs are growing faster than the overall clean energy labor market. Between 2015 and 2019, the number of full-time equivalent clean energy workers in Connecticut increased 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 4. Full-Time Equivalent Clean Energy Jobs, 2015-2019⁴



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.



⁴ 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 Regional Product (GRP). This represents a 12 percent increase since 2017. To date, the clean energy industry accounts for 2.6 percent of total GRP in the state.¹

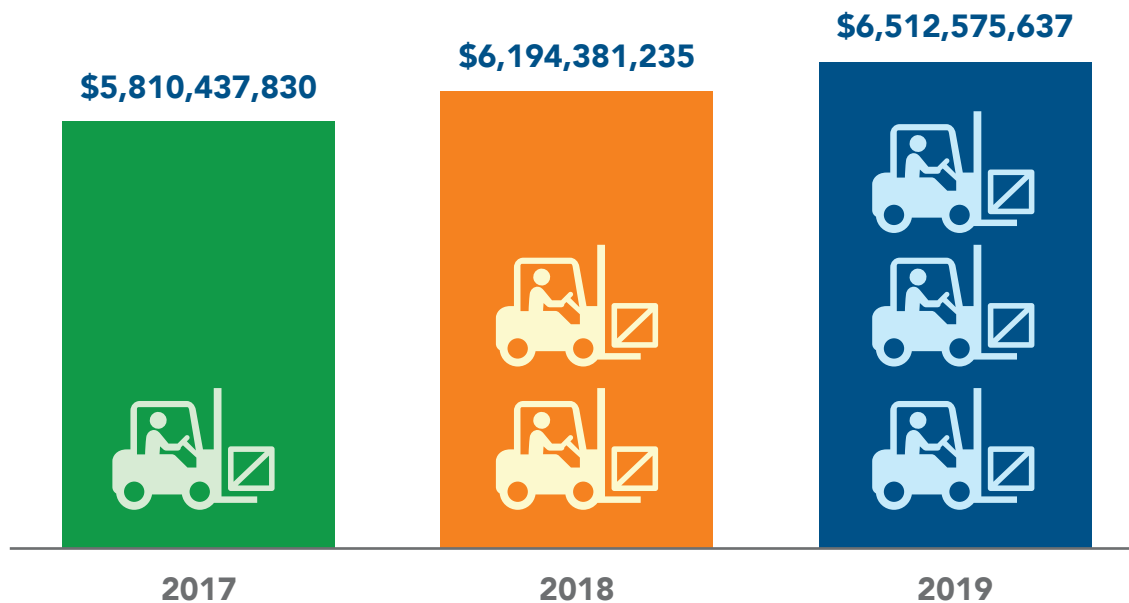


FPO

Table 1 Clean Energy Gross Regional Product (GRP) By Value Chain, 2019

Value Chain	2019 Clean Energy GRP
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 2 Clean Energy Gross Regional Product (GRP), 2017-2019



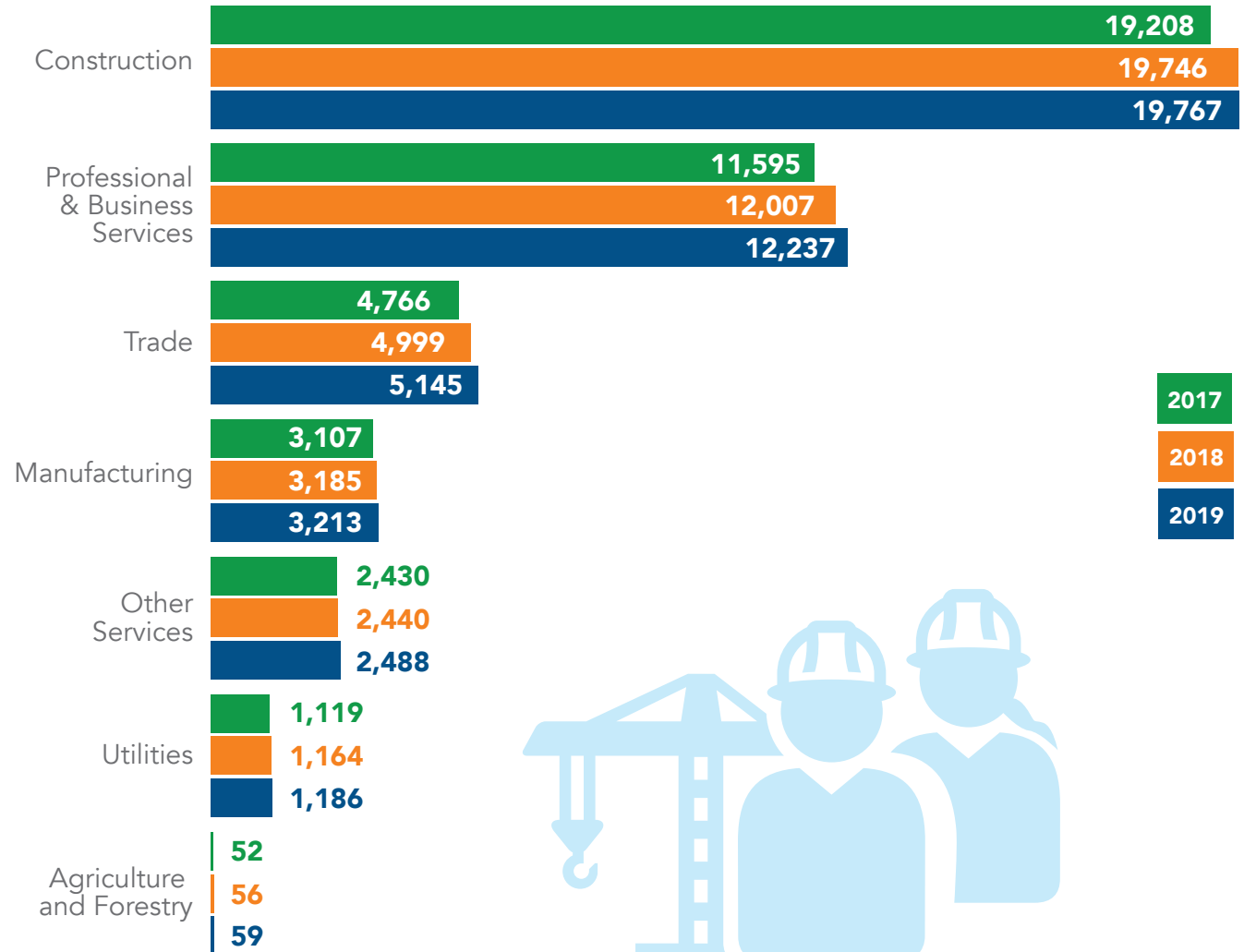
¹ Total Connecticut Gross Domestic Product from Bureau of Economic Analysis (BEA), 2019.

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 14 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 5
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 6
Value Chain
Proportional
Employment By
Clean Energy
Sector, 2019

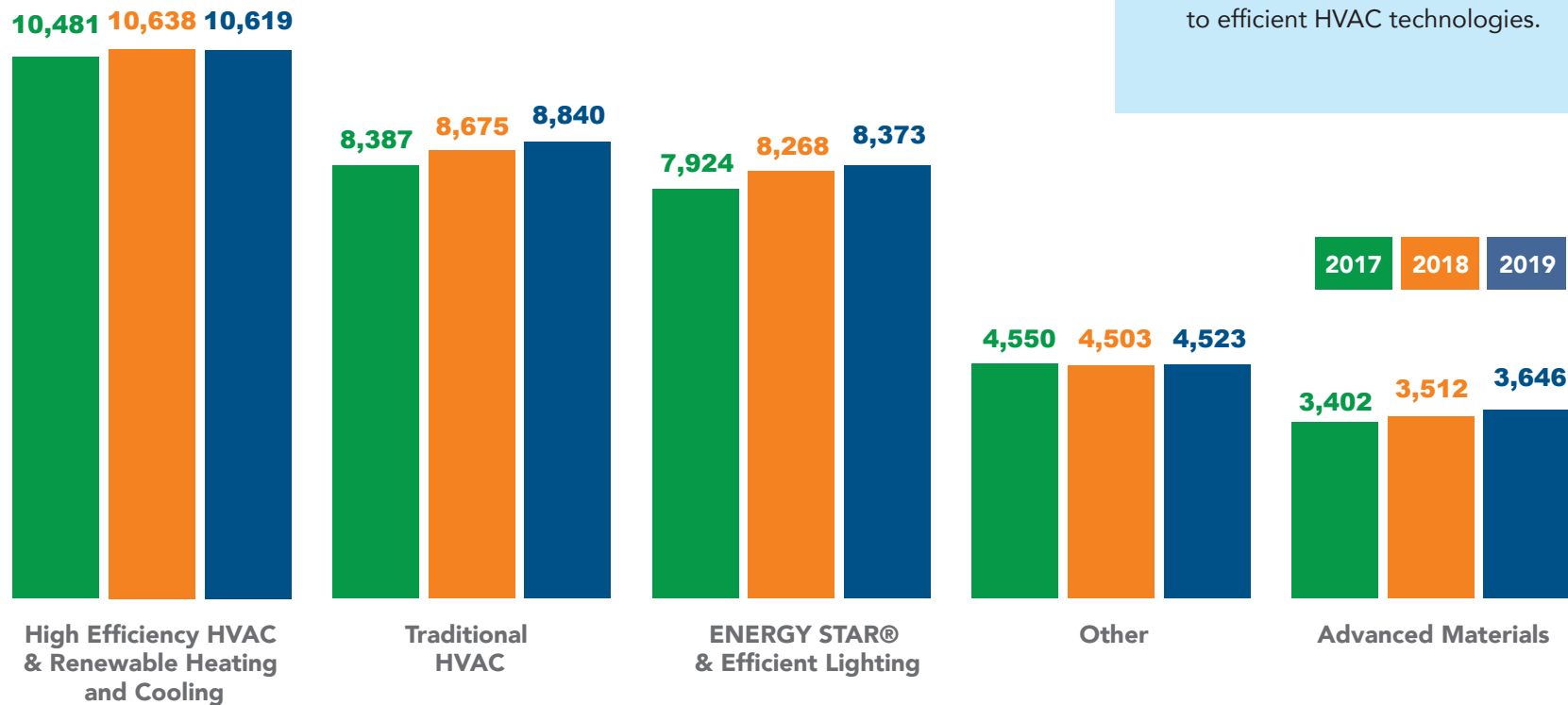
Clean Energy Sector	Clean Energy Generation	Clean Grid & Storage	Clean Grid & Storage	Clean Fuels	Alternative Transportation	Connecticut Clean Energy Average
Agriculture and Forestry	0.0%	0.0%	0.0%	9.3%	0.0%	0.1%
Utilities	24.6%	0.0%	0.0%	0.0%	0.0%	2.7%
Construction	26.4%	62.5%	50.0%	0.0%	0.0%	44.8%
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 cooling⁵ 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 8 Energy Efficiency Employment By Sub-Technology, 2017-2019



⁵ 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.

TK

- Energy Efficiency photo page with call-outs
 - o Retail Products - Eversource
 - o LED Lighting Contractors - UI
 - o HES and HES-IE - UI

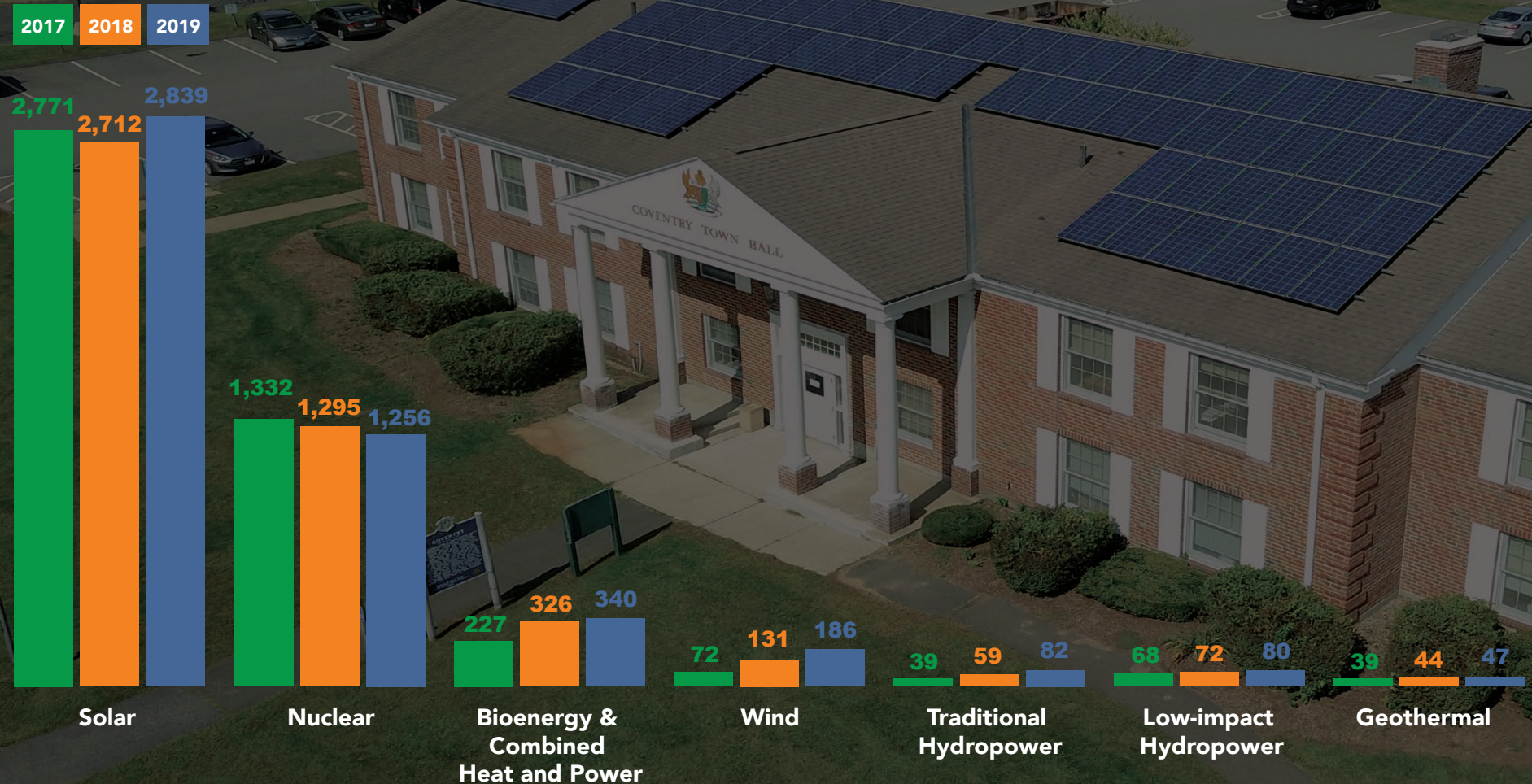


Solar and nuclear power generation are the largest components of the clean energy generation workforce in Connecticut. The state's solar industry rebounded following a two percent decline between 2017 and 2018 resulting from changes in domestic business models (e.g., collapse of Solar City) and global 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.

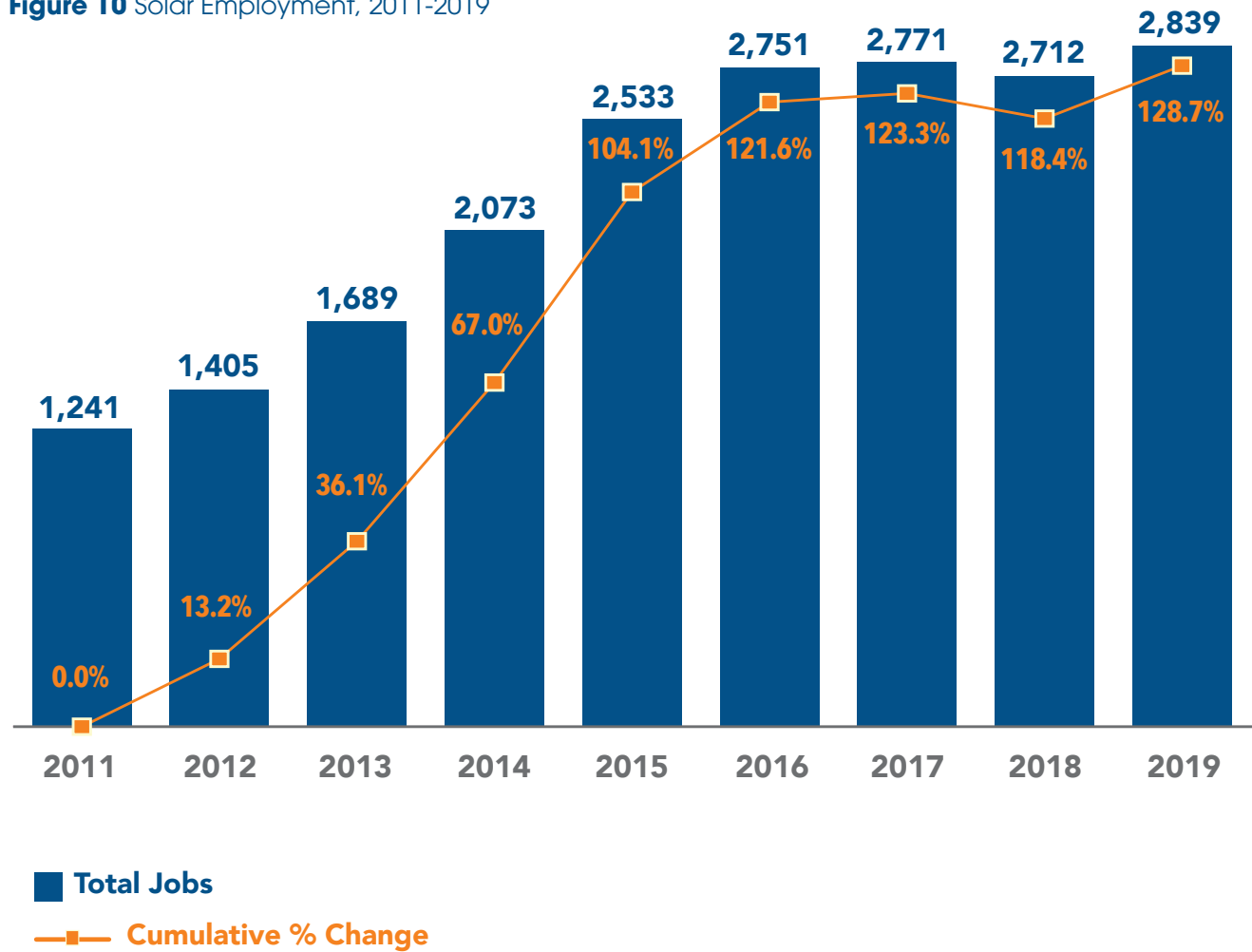
Figure 9 Clean Energy Generation Employment By Sub-Technology, 2017-2019



Town of Coventry, CT: Energy Upgrade to 582.49 kW across 6 rooftop



Figure 10 Solar Employment, 2011-2019



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.



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 \$1.5 million in C-PACE gap financing for the restoration of the powerhouse and deep energy efficiency retrofits of the property, will help revitalize downtown Putnam and provide much-needed affordable housing in the state's "quiet corner".

Offshore Wind - UI

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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.

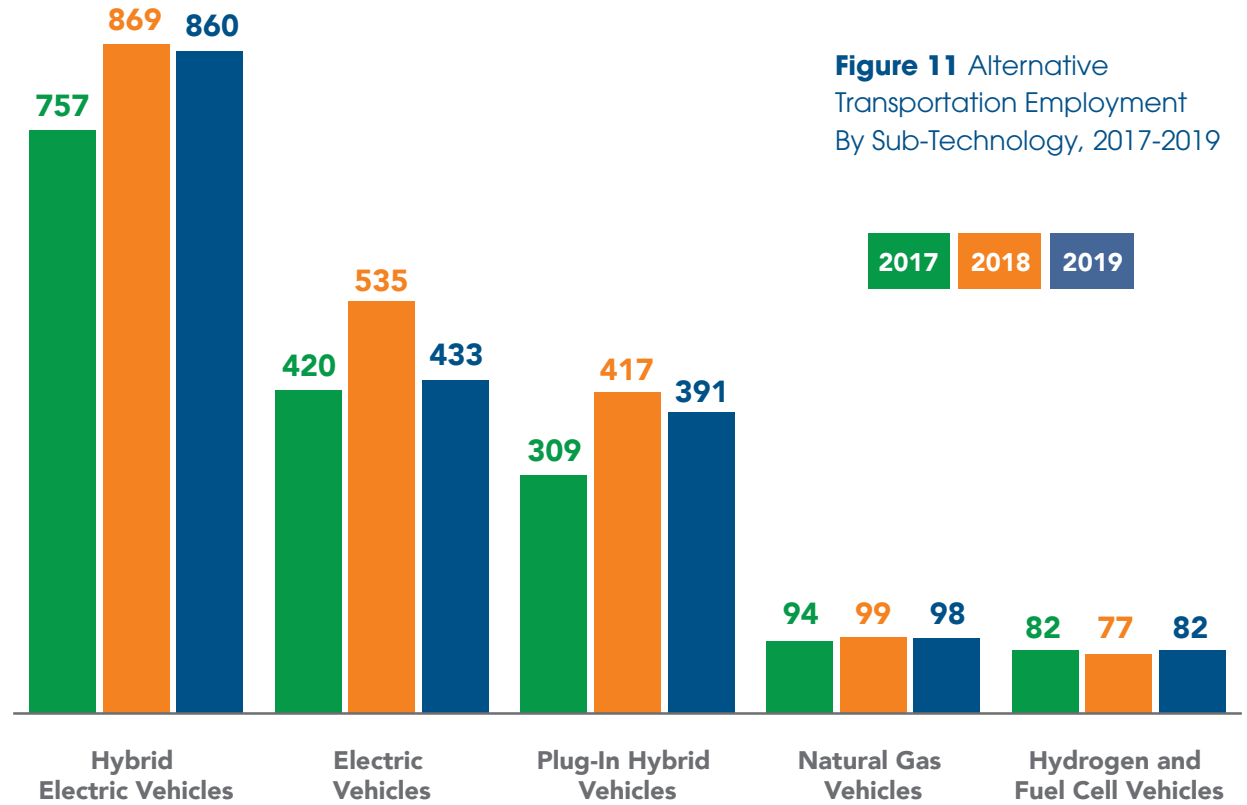


Figure 11 Alternative Transportation Employment By Sub-Technology, 2017-2019



EV and CHEAPR Incentive (from DEEP)

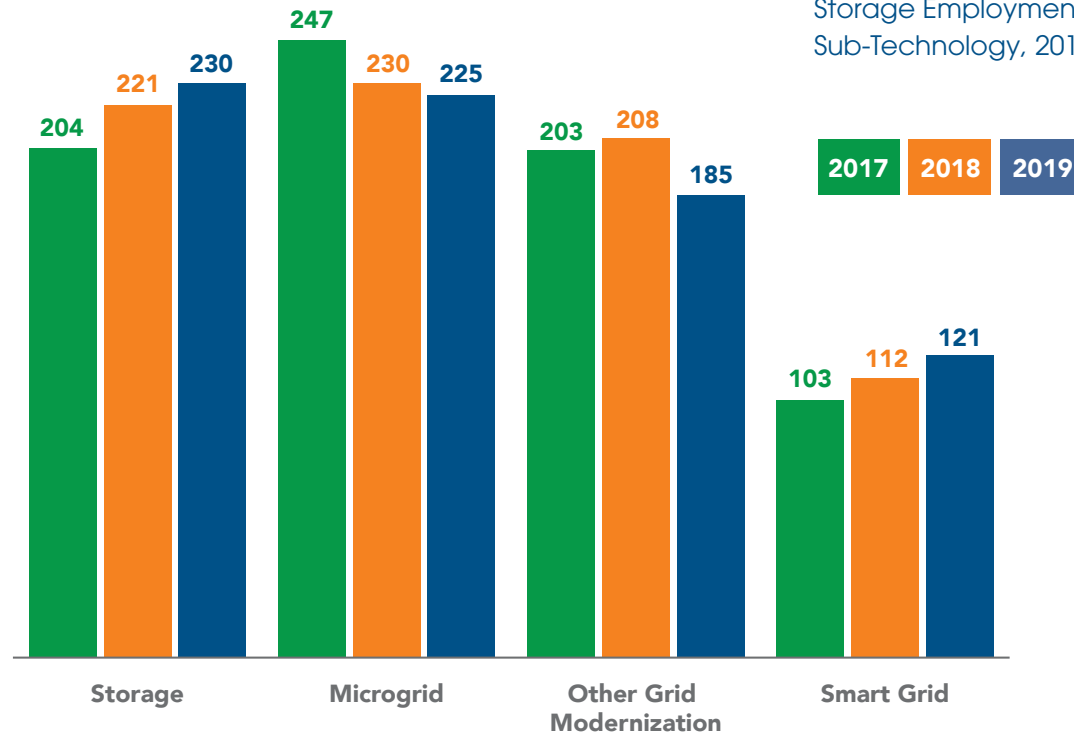
Call-out photo/caption TC

A small sector in Connecticut’s clean energy economy, clean grid and storage accounted for 761 jobs in 2019. Storage companies⁶ 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.

⁶ 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 12 Clean Grid And Storage Employment By Sub-Technology, 2017-2019



Grid Modernization Docket (from DEEP)

Call-out photo/caption TC

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.¹⁷ FuelCell Energy (378 employees), Doosan Fuel Cell America (66 employees), and Proton OnSite (125 employees).¹⁸ are among the largest fuel cell companies in the country, earning Connecticut the nickname of the “Silicon Valley” for fuel cell technology.¹⁹ 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.²⁰

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 2022.²¹

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.²² 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.²³

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 cell busses in their fleet.^{24,25} The state is also home to two publicly-available refueling stations for hydrogen cars, with eleven more in development.²⁶ The NEESC recommends that the state develop six to seven hydrogen refueling stations for a goal of supporting nearly 600 fuel cell electric vehicles.²⁷



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.

¹⁷ US Department of Energy. State of the States: Fuel Cells in America 2016, 7th Edition. November 2016.

¹⁸ 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>.

¹⁹ <https://www.ctpost.com/local/article/Fuel-cell-companies-reach-out-to-legislators-for-12653242.php>

²⁰ Northeast Electromechanical Energy Storage Cluster. Connecticut Hydrogen Economy. January 2018.

²¹ <https://www.greentechmedia.com/articles/read/will-high-temperature-fuel-cells-scale>

²² <http://chfcc.org/ct-fuel-cell-installations-and-approved-projects/>

²³ Northeast Electromechanical Energy Storage Cluster. Connecticut Hydrogen Economy. January 2018.

²⁴ National Renewable Energy Laboratory. Fuel Cell Buses in U.S. Transit Fleets: Current Status 2017. November 2017.

²⁵ <https://www.hartfordbusiness.com/article/ct-laying-groundwork-for-next-green-wave-hydrogen-cars>

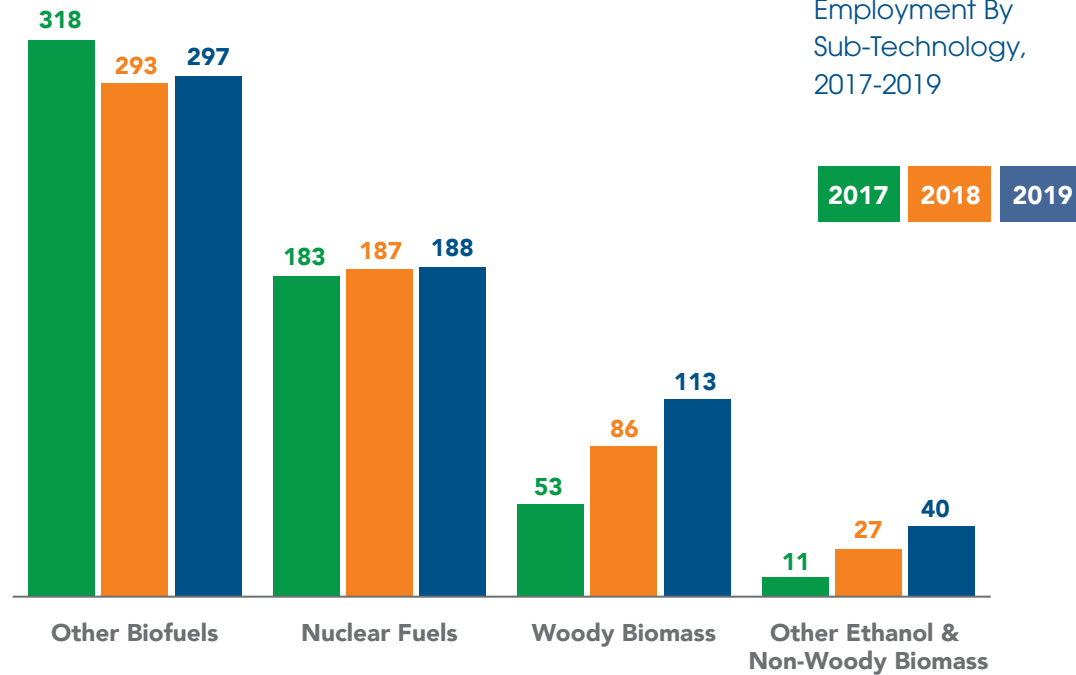
²⁶ Northeast Electromechanical Energy Storage Cluster. Connecticut: Market Potential for Hydrogen and Fuel Cell Transportation Applications. February 2017.

²⁷ 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 biomass¹² (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.

¹² Other ethanol and non-woody biomass (including biodiesel) covers all fuels made from other materials such as straw, manure, vegetable oil, animal fats, etc.



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 a quarter (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.

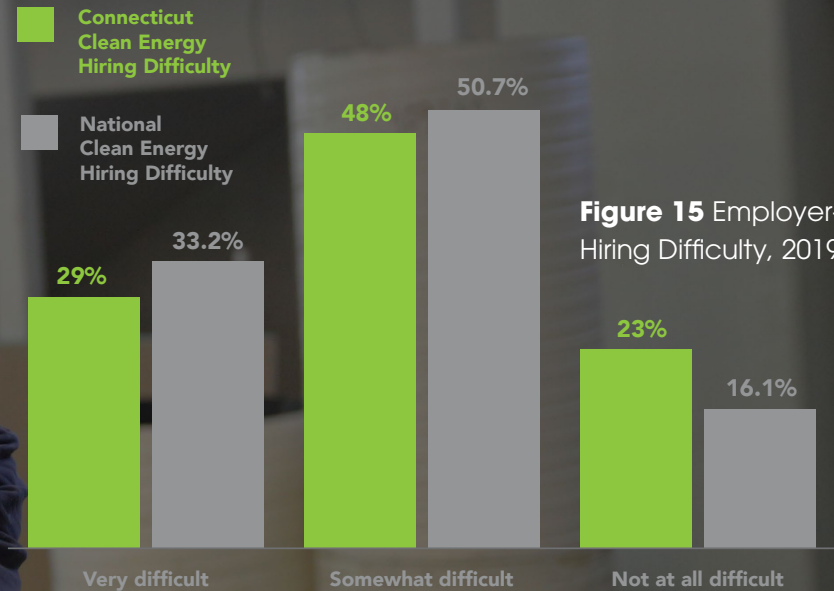
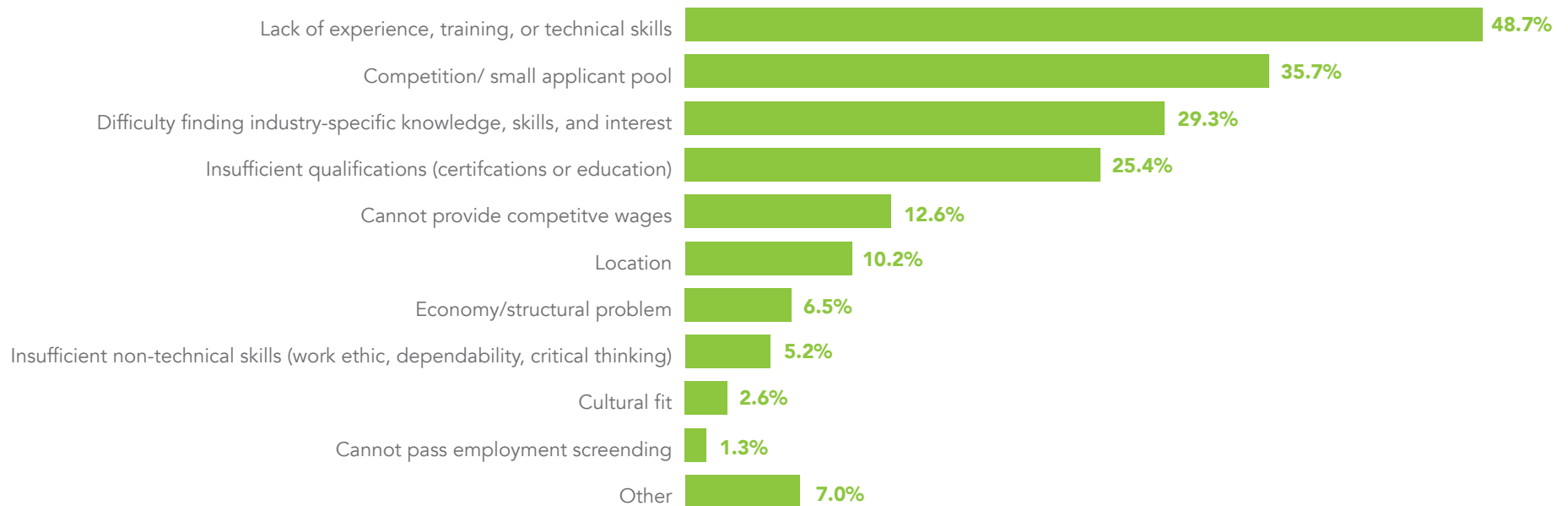


Figure 15 Employer-Reported Hiring Difficulty, 2019

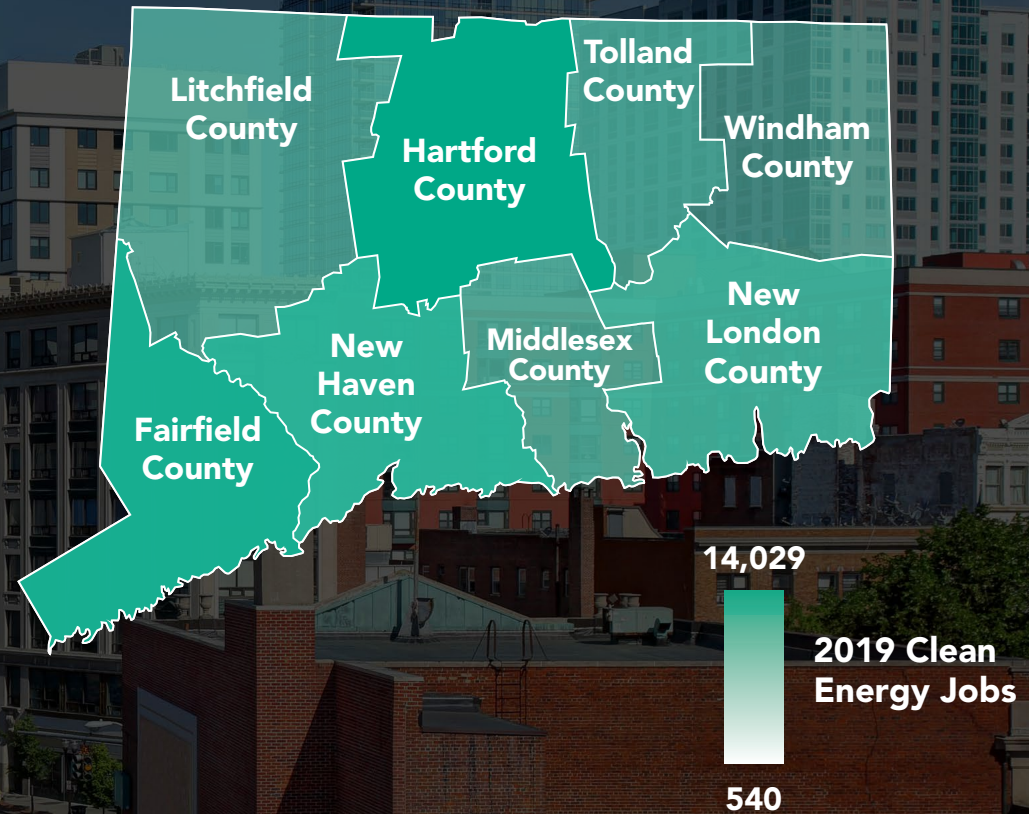
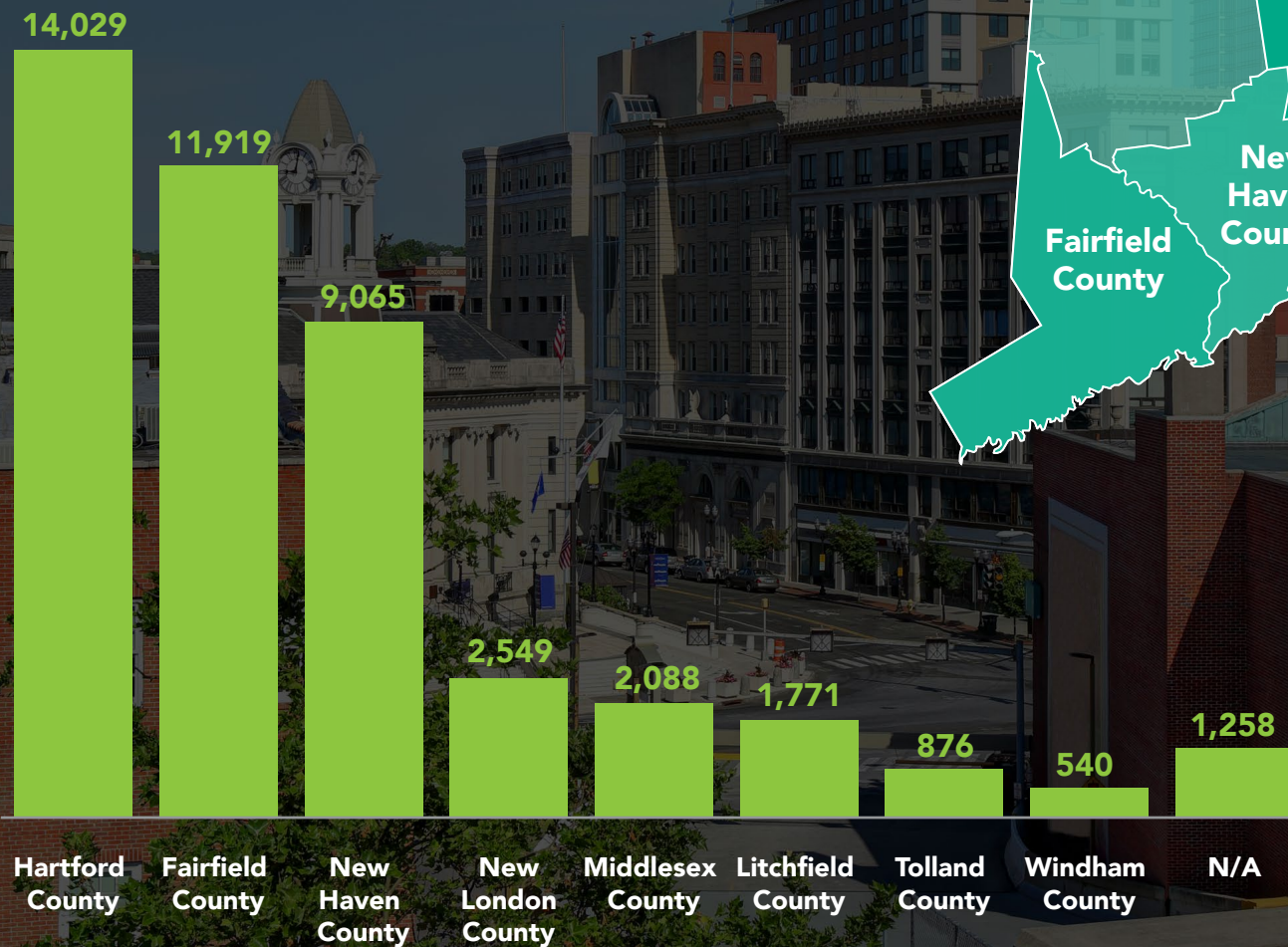
Figure 16 Reasons For Hiring Difficulty In Connecticut, 2019



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 22 Map Of Clean Energy Employment By County, 2019

Figure 20 Clean Energy Employment By County, 2019¹⁴



¹⁴ Employment categorized as "n/a" could not be assigned to a single location.

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 6 Current Clean Energy-Related Training Programs By Location, 2019¹⁵

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%

¹⁵ 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.

Connecticut's clean energy economy is slightly less diverse than the national clean energy labor market, though this is 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 2 Clean Energy Workforce Demographics, 2019¹⁶

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 3 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%

¹⁶ 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 as Emsi 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/>

Wage Data

Reported technology wages at the 5-digit occupational level (as determined by the Standard Occupational Classifications, or SOCs) are a product of 5-digit SOC wages provided by the Bureau of Labor Statistics, a technology-specific multiplier created at the 2-digit occupational level, and a geographic-specific multiplier created at the 2-digit occupational level.

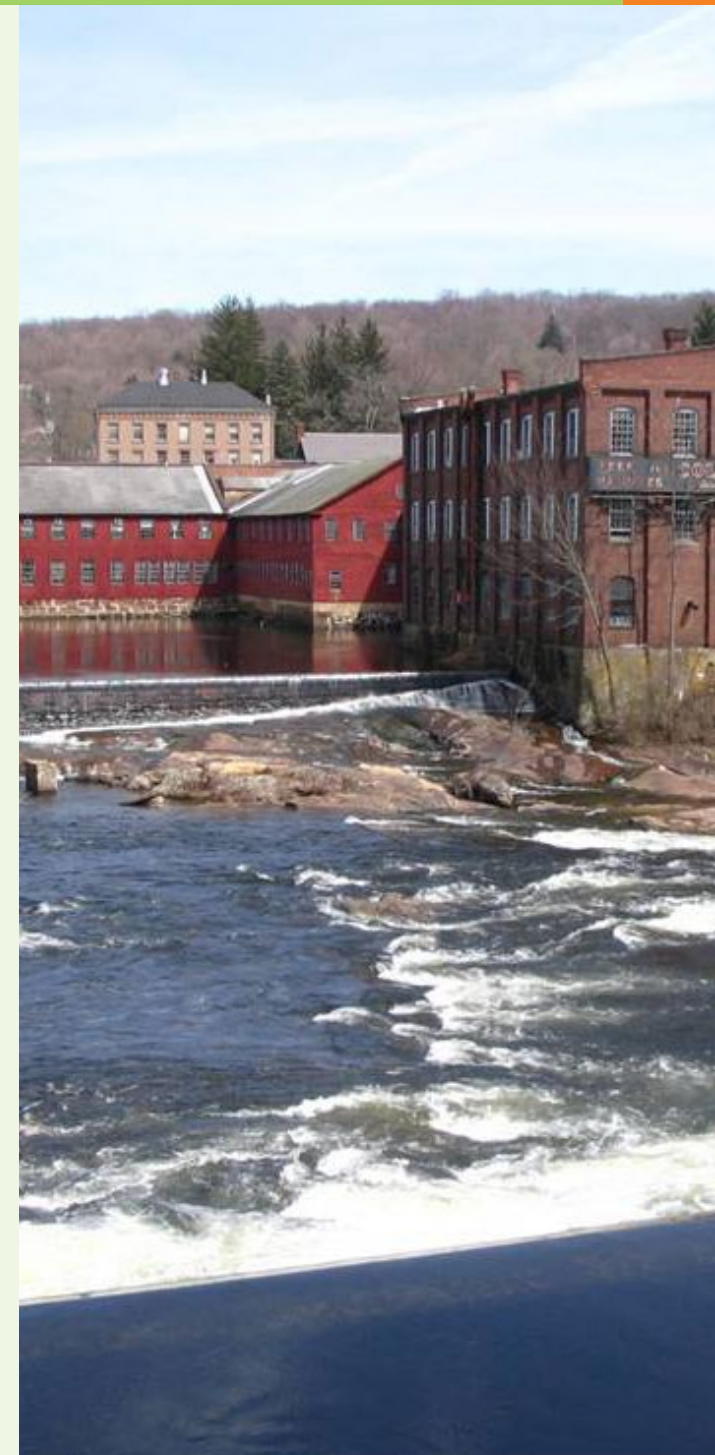
The technology-specific multiplier is a sum of the products of occupational group multipliers and the share of that occupational group's employment within total technology employment (as reported in the 2020 US Energy and Employment Report). Occupational group multipliers are the quotients of occupational group averages of technology-specific 5-digit SOC wages over the averages of their

corresponding BLS-provided 5-digit SOC wages. As stated above, technology-specific 5-digit SOC wages are a product of BLS-provided 5-digit SOC wages and a technology-specific 2-digit SOC multiplier. These technology-specific 2-digit SOC multipliers are the quotients of adjusted 2-digit SOC wages over BLS-provided 2-digit SOC wages. The adjusted 2-digit SOC wages are four-fifths BLS-provided 2-digit SOC wages and one-fifth survey-produced 2-digit SOC wages from USCA abiding firms. The survey-produced 2-digit SOC wages are averages of survey-produced 5-digit SOC salaries divided by 2080 (a year's working hours assuming full-time employment).

The geographic-specific multiplier is the quotient of the BLS 2-digit SOC wages in Connecticut over the national BLS provided 2-digit SOC wages. This allows the research team to capture the premium or discount the USCA defined region has over the rest of the nation

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.



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.³²

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 services³³
- 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

³² 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

³³ “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.

Back Cover Image

Contact information

Heating and Air Conditioning Mechanics and Installers

HVAC Mechanics install, service, or repair heating and air conditioning systems in residences or commercial establishments.



ENTRY-LEVEL WAGE

\$22.41

MID-LEVEL WAGE

\$32.50

HIGH-LEVEL WAGE

\$44.29

KNOWLEDGE

Mechanical
Customer and Personal Service
Building and Construction
Design
Physics

SKILLS

Equipment Maintenance
Installation
Quality Control Analysis
Troubleshooting
Operation Monitoring

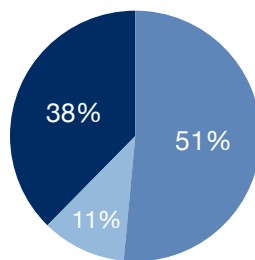
ABILITIES

Problem Sensitivity
Finger Dexterity
Near Vision
Visualization
Manual Dexterity

TYPICAL EDUCATION

Post-Secondary Certificate

PROMOTIONAL OPPORTUNITIES



- Within the Organization
- Recruit from Outside
- Both

COMMON CERTIFICATION

HVAC Certificate
EPA 608
OSHA General Safety

Healthcare Benefits

31% Full Benefits

47% Partial Benefits
21% No Benefits

Retirement Benefits

60% With Benefits

40% No Benefits

Helper



HVAC Mechanics



**Lead Technician
Supervisor**



Comprehensive Plan

Green Bonds US

845 Brook Street, Rocky Hill, CT 06067 > 860-563-0015 > ctgreenbank.com
300 Main Street, 4th Fl., Stamford, CT 06901



Comprehensive Plan

Fiscal Year 2020 & Beyond

July 2019

Revised July 2020

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1. Executive Summary

"The civilization of New England has been like a beacon lit upon a hill, which, after it has diffused its warmth around, tinges the distant horizon with its glow."

Alexis de Tocqueville, Democracy in America

Although Connecticut is one of the smallest states in the country, its decades of legislative leadership on climate change has had an influential impact across the country and around the world. One example of this was on July 1, 2011, when in a bipartisan manner, Public Act 11-80¹ was passed. Within Section 99 of that seminal act, the nation's first state-level green bank was formed. The Connecticut Green Bank ("the Green Bank") is a public policy innovation, a catalyst that helps mobilize greater local and global investment to address climate change.

Since its inception, the Green Bank has mobilized nearly \$1.7 billion of investment into Connecticut's clean energy economy at nearly a 7 to 1 leverage ratio of private to public funds, supported the creation of over 20,000 direct, indirect, and induced job-years, reduced the energy burden on over 40,000 families (in particular low-to-moderate income families) and businesses, deployed nearly 360 MW of clean energy that will help avoid over 5.8 million tons of CO₂ emissions and save over \$200 million of public health costs over the life of the projects, and helped generate \$87.1 million in individual income, corporate, and sales tax revenues to the State of Connecticut.²

As a result of the Green Bank's success as an integral public policy tool addressing climate change in Connecticut, there has been growing national public policy interest at the local,³ federal,⁴ and international⁵ levels to realize similar results. This green bank movement is about increasing and accelerating the flow of private capital into markets that energize the green economy to confront climate change and provide all of society a healthier, more prosperous future. As the "spark" to the green bank movement, the Green Bank was awarded the prestigious 2017 Innovations in American Government Awards by the Ash Center at Harvard University's Kennedy School of Government⁶.

¹ An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future.

² [FY19 Comprehensive Annual Financial Report](#)

³ American Green Bank Consortium – <https://greenbankconsortium.org/>

⁴ US Green Bank Act of 2019 introduced by Senators Blumenthal (CT), Markey (MA), Murphy (CT), Van Hollen (MD), and Whitehouse (RI) in the Senate, National Climate Bank Act of 2019 introduced by Senators Markey (MA) and Van Hollen (MD), with co-sponsors Blumenthal (CT) and Schatz (HI), the US Green Bank Act of 2019 by Representative Himes (CT) and 13 others in the House. Democratic Presidential Candidates Inslee and Bennet proposed \$90 billion and \$1 trillion "green bank" and "climate banks," respectively as part of their campaigns.

⁵ Green Bank Network – <https://greenbanknetwork.org/>

⁶ <https://ash.harvard.edu/news/connecticut-green-bank-awarded-harvards-2017-innovations-american-government-award>

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At home and abroad, there is agreement that accelerating the flow of capital into the green economy is one key to addressing the climate crisis. The Paris Agreement's third aim (beyond mitigation of greenhouse gas emissions and adaptation to climate change impacts) is making finance flows consistent with a pathway towards reduced emissions and increased climate resilient development. The Center for American Progress estimates that the U.S. needs at least \$200 billion in renewable energy and energy efficiency investment a year for 20 years to reduce carbon emissions and avert climate disaster.⁷ In a similar vein, the United Nations estimates that \$90 trillion of investment is needed over the next 15 years to advance sustainable development and confront the worst effects of climate change.⁸

To put these numbers into perspective, this is the equivalent of between \$620 to \$800 of investment per person per year for the next 15 years, respectively – or, the equivalent of nearly \$3 billion a year of investment in Connecticut's green economy!

Faced with the magnitude of investment required to put society on a more sustainable path to confront climate change, the Green Bank convened a group of stakeholders at the Pocantico Conference Center of the Rockefeller Brothers Fund in February of 2019 for a two-day strategic retreat entitled "Connecticut Green Bank 2.0 – From 1 to 2 Orders of Magnitude". Having convened at the Pocantico Conference Center in November of 2011 to establish the Green Bank's first strategic plan (i.e., Green Bank 1.0), this new group of stakeholders met to reflect on the past seven years and then to envision an even bigger future for the Green Bank (i.e., Green Bank 2.0) consistent with the larger investment required.⁹

The retreat identified several key findings and recommendations for the Green Bank, including:

- **Commitment to Address Climate Change** – as the most urgent issue to address, the Green Bank needs to increase and accelerate the impact of its model to support the implementation of Connecticut's climate change plan;¹⁰
- **Scaling Up Investment and Impact in Connecticut and Beyond** – in order to achieve the climate change goals set forth, more investment from private capital sources leveraged by innovative public sector financing will be needed to scale-up and scale-out the green bank model's impact; and
- **Green Bonds to Increase Access to Capital** – with the ability to issue bonds, the Green Bank is able to increase its access to capital beyond the current sources of funding to scale-up its investment activity, while providing more opportunities to engage citizens in new ways to invest in the state's growing green economy, including through

⁷ "Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities" by the Center for American Progress (September 2014).

⁸ "Financing Sustainable Development: Moving from Momentum to Transformation in a Time of Turmoil" by the UNEP (September 2016).

⁹ "Connecticut Green Bank 2.0 – From 1 to 2 Orders of Magnitude" at the Pocantico Conference Center of the Rockefeller Brothers Fund (February 6-7, 2019)

¹⁰ "Building a Low Carbon Future for Connecticut – Achieving a 45% GHG Reduction by 2030" recommendations from the Governor's Council on Climate Change (December 18, 2018)

the issuance of “mini green bonds” (i.e., bonds with denomination values of \$1,000 or less) that will engage citizens in making investments alongside the Green Bank.

Increasing and accelerating investment in the green economy by using limited public resources to attract and mobilize multiples of private capital investment is paramount to society’s efforts to pursue sustainable development, while confronting climate change. More investment in the green economy creates more jobs in our communities, reduces the burden of energy costs on our families and businesses (especially the most vulnerable), and reduces fossil fuel pollution that causes local public health problems and global climate change.

Investment for the sake of investment is not enough unless we have an engaged citizenry that is active in communities across the state! Whether through markets or within communities in partnership with other community-based organizations, the Green Bank is bringing people together and strengthening the bonds we share with one another. In order 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 Green Bank is launching the “Green Bonds US” campaign, that seeks to promote a simple but critically important message; green brings us together, green bonds us.

As the cover to the Comprehensive Plan of the Green Bank suggests, by making clean energy more accessible and affordable to everyone – Green Bonds US – society will reap significant gains from moving forward in the same direction together – for we can’t have environmentalism without humanitarianism.

2. Organizational Overview

The Green Bank¹¹ was established by Governor Malloy and Connecticut’s General Assembly on July 1, 2011 through Public Act 11-80 as a quasi-public agency that supersedes the former Connecticut Clean Energy Fund (“CCEF”). As the nation’s first state green bank, the Green Bank leverages public and private funds to drive investment and scale-up clean energy deployment in Connecticut.

The Green Bank’s statutory purposes are:

- To develop programs to finance and otherwise support clean energy investment in residential, municipal, small business and larger commercial projects and such other programs as the Green Bank may determine;
- To support financing or other expenditures that promote investment in clean energy sources to foster the growth, development and commercialization of clean energy sources and related enterprises; and

¹¹ Public Act 11-80 repurposed the Connecticut Clean Energy Fund (CCEF) administered by Connecticut Innovations, into a separate quasi-public organization called the Clean Energy Finance and Investment Authority (CEFIA). Per Public Act 14-94, CEFIA was renamed to the Connecticut Green Bank.

- To stimulate demand for clean energy and the deployment of clean energy sources within the state that serves end-use customers in the state.

The Green Bank’s purposes are codified in Section 16-245n(d)(1) of the Connecticut General Statutes (“CGS”) and restated in the Green Bank’s Board approved [Resolution of Purposes](#).

The Green Bank is a public policy innovation that exemplifies Connecticut’s nearly two-decade history of bipartisan gubernatorial leadership on the issue of climate change. Other leadership highlights include:

- **Governor Rowland** – co-chaired the New England Governors and Eastern Canadian Premiers Conference, which established a regional commitment to reduce greenhouse gas emissions (i.e., 1990 levels by 2010, 10% below 1990 levels by 2020, and 80% below 2001 levels by 2050);¹²
- **Governor Rell** – supported Public Act 08-98¹³ codifying the regional commitment into state law, appointing Gina McCarthy to be the Commissioner of the Department of Environmental Protection who would help lead the development of the Regional Greenhouse Gas Initiative and later become the EPA Administrator under President Obama leading the development of the Clean Power Plan and the U.S. participation in the Paris Agreement;
- **Governor Malloy** – led the passage of PA 11-80 establishing the Department of Energy and Environmental Protection (“DEEP”), creating the Green Bank, and other policies catalyzing the market for clean energy, as well as Public Acts 18-50¹⁴ and 18-82¹⁵ increasing the state’s renewable portfolio standard to 40% by 2030 and establishing a midterm greenhouse gas emissions reduction target of 45% below 2001 levels by 2030, respectively; and
- **Governor Lamont** – his campaign plan for Connecticut¹⁶ seeks to achieve carbon neutrality by 2050 and setting a 100% renewable portfolio standard by 2050 which would help the state realize green jobs in energy efficiency and clean energy (e.g., fuel cells, offshore wind, solar PV, etc.), while reducing energy costs.

The Connecticut General Assembly has worked hand-in-hand with these Governors and the citizens of the state over the years to devise and support public policies that promote clean energy and lead the movement on climate change action.

2.1 Vision

...a world empowered by the renewable energy of community.

¹² NEG-ECP Resolution 26-4 adopting the “Climate Change Action Plan 2001” (August 2001 in Westbrook, CT)

¹³ An Act Concerning Connecticut Global Warming Solutions

¹⁴ An Act Concerning Connecticut’s Energy Future

¹⁵ An Act Concerning Climate Change Planning and Resiliency

¹⁶ Ned’s Plan for Connecticut – Addressing Climate Change & Expanding Renewable Energy

2.2 Mission

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.¹⁷

2.3 Goals

To achieve its vision and mission, the Green Bank has established the following three goals:

1. To leverage limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut.
2. To strengthen Connecticut's communities by making the benefits of the green economy inclusive and accessible to all individuals, families, and businesses.
3. To pursue investment strategies that advance market transformation in green investing while supporting the organization's pursuit of financial sustainability.

The vision, mission, and goals support the implementation of Connecticut's clean energy policies be they statutorily required (e.g., CGS 16-245ff), planning (e.g., Comprehensive Energy Strategy), or regulatory (e.g., [Docket No. 17-12-03](#)) in nature.

2.4 Definition – Clean Energy

The Green Bank's investment focus is on "clean energy" as defined by CGS Section 16-245n:

- **Clean Energy** – clean energy means solar photovoltaic energy, solar thermal, geothermal energy, wind, ocean thermal energy, wave or tidal energy, fuel cells, landfill gas, hydropower that meets the low-impact standards of the Low-Impact Hydropower Institute, hydrogen production and hydrogen conversion technologies, low emission advanced biomass conversion technologies, alternative fuels, used for electricity generation including ethanol, biodiesel or other fuel produced in Connecticut and derived from agricultural produce, food waste or waste vegetable oil, provided the Commissioner of Energy and Environmental Protection determines that such fuels provide net reductions in greenhouse gas emissions and fossil fuel consumption, usable electricity from combined heat and power systems with waste heat recovery systems, thermal storage systems, other energy resources and emerging technologies which have significant potential for commercialization and which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission, financing of energy efficiency projects, projects that seek to deploy electric, electric hybrid, natural gas or alternative fuel vehicles and associated infrastructure, any related storage, distribution, manufacturing technologies or facilities and any Class I renewable energy source, as defined in section 16-1.

¹⁷ Reducing greenhouse gas emissions and confronting climate change is supported by a number of public policies, including, but not limited to PA 17-3, PA 18-82, PA 19-71, Governor Lamont's Executive Orders [1 and 3](#), Comprehensive Energy Strategy, Governor Malloy's Council on Climate Change, and many other past acts, plans, or policies.

3. Governance and Organizational Structure

The Green Bank is overseen by a governing Board of Directors comprised of ex officio and appointed members, while the organization of the Green Bank is administered by a professional staff overseeing two business units – Incentive Programs and Financing Programs.

3.1 Governance

Pursuant to Section 16-245n of the CGS, the powers of the Green Bank are vested in and exercised by a Board of Directors¹⁸ that is comprised of eleven voting and one non-voting members each with knowledge and expertise in matters related to the purpose of the organization – see Table 1.¹⁹

Table 1. Board of Directors of the Connecticut Green Bank

Position	Status	Appointer	Voting
State Treasurer (or designee)	Ex Officio	Ex Officio	Yes
Commissioner of DEEP (or designee)	Ex Officio	Ex Officio	Yes
Commissioner of DECD (or designee)	Ex Officio	Ex Officio	Yes
Residential or Low-Income Group	Appointed	Speaker of the House	Yes
Investment Fund Management	Appointed	Minority Leader of the House	Yes
Environmental Organization	Appointed	President Pro Tempore of the Senate	Yes
Finance or Deployment of Renewable Energy	Appointed	Minority Leader of the Senate	Yes
Finance of Renewable Energy	Appointed	Governor	Yes
Finance of Renewable Energy	Appointed	Governor	Yes
Labor	Appointed	Governor	Yes
R&D or Manufacturing	Appointed	Governor	Yes
President of the Green Bank	Ex Officio	Ex Officio	No

There are four (4) committees of the Board of Directors of the Green Bank, including Audit, Compliance and Governance Committee, Budget, Operations, and Compensation Committee, Deployment Committee, and the Joint Committee of the Energy Efficiency Board (“EEB”) and the Green Bank.²⁰

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To support the Joint Committee of the EEB and the Green Bank, the following is a principal statement to guide its activities:

The EEB and the 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.

The Board of Directors of the Green Bank is governed through enabling legislation, as well as by an Ethics Statement and Ethical Conduct Policy, Resolutions of Purposes, Bylaws, Joint

¹⁸ <https://www.ctgreenbank.com/about-us/governance/board-of-directors/>

¹⁹ <https://www.ctgreenbank.com/about-us/governance/>

²⁰ Pursuant to Section 16-245m(d)(2) of the Connecticut General Statutes

[Committee Bylaws](#), and a Comprehensive Plan. All meetings, agendas, and materials of the Green Bank's Board of Directors and its Committees are publicly available on the organization's website.^{21,22}

3.2 Organizational Structure

The organizational structure of the Green Bank is comprised of two (2) business units, including:

- **Incentive Programs** – the Governor and the Connecticut General Assembly from time-to-time may decide that there are certain incentive (or grant) programs that they seek to have the Green Bank administer (e.g., CGS 16-245ff). The Green Bank administers such programs with the goal of delivering on the public policy objectives, while at the same time ensuring that funds invested by the Green Bank are cost recoverable. For example, the Green Bank administers the Residential Solar Investment Program ("RSIP") whereby through a declining incentive block structure no more than 350 MW of new residential solar PV systems are deployed, while nurturing the sustained orderly development of a local state-based solar PV industry. Through the public policy creation of a Solar Home Renewable Energy Credit ("SHREC"), the Green Bank is able to recover its costs for administering the RSIP by selling such credits to the Electric Distribution Companies ("EDCs") through a Master Purchase Agreement ("MPA") to support their compliance under the Class I Renewable Portfolio Standard ("RPS"). Costs recovered from such mechanisms are expected to cover the incentive, administrative expenses, and financing expenses of the Incentive Programs business unit.
- **Financing Programs** – the Green Bank's core business is financing projects. The Green Bank's focus is to leverage limited public funds to attract and mobilize multiples of private capital investment to finance clean energy projects. In other words, the use of resources by the Green Bank are to be invested with the expectation of principal and interest being paid back over time. For example, the Green Bank administers the Commercial Property Assessed Clean Energy ("C-PACE") program. Through C-PACE, the Green Bank provides capital to building owners to make clean energy improvements on their properties that is paid back over time from a benefit assessment on the building owner's property tax bill. The interest from these types of investments, over time, is expected to cover the operational expenses and a return for the Financing Programs business unit.

These two business units – Incentive Programs and Financing Programs – serve the purposes of the Green Bank. To support the business units and their investments, the Green Bank has administrative support from finance, legal, marketing and operations.

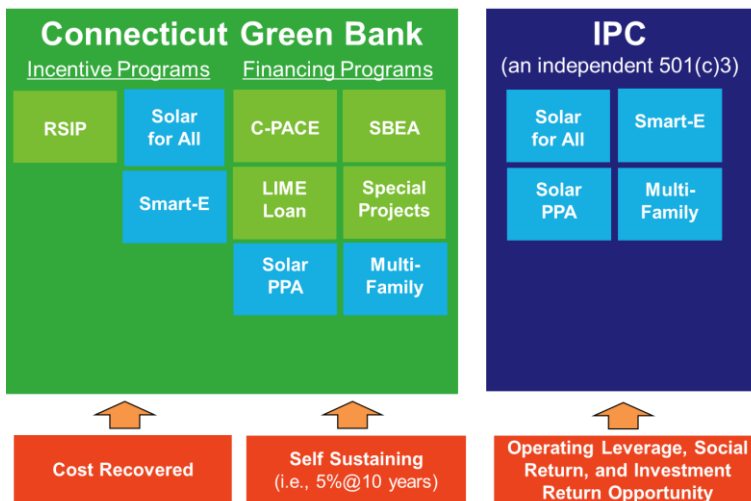
²¹ <http://www.ctgreenbank.com/about-us/board-member-resources/connecticut-grboard-meetings/>

²² <http://www.ctgreenbank.com/about-us/board-member-resources/connecticut-grittee-meetings/>

An Employee Handbook and [Operating Procedures](#) have been approved by the Board of Directors and serve to guide the staff to ensure that it is following proper contracting, financial assistance, and other requirements.

In 2018, the Green Bank, in partnership with DEEP and the Kresge Foundation, formed a nonprofit organization called Inclusive Prosperity Capital ("IPC"). The mission of IPC is to attract mission-oriented investors in underserved clean energy market segments (e.g., low-to-moderate income single and multifamily properties) of the green economy. Although not an affiliate, nor a component unit of the Green Bank, IPC serves an important role supporting the goals of Connecticut public policy by administering programs on behalf of the Green Bank. For an overview of the organizational structure of the Green Bank, and its partnership with IPC – see Figure 1.

Figure 1. Organizational Structure of the Green Bank with Support from Inclusive Prosperity Capital



4. Incentive Programs

The Green Bank manages incentive programs. That is to say that it oversees grant or subsidy program(s) (including credit enhancements – interest rate buydowns and loan loss reserves) that deploy clean energy, while at the same time cost recovering the expenses associated with those programs within the business unit – including, but not limited to, incentives, administrative expenses, and financing expenses, as well as loan loss reserves on the balance sheet.

Per CGS 16-245ff, updated by Public Act 19-35²³, the Green Bank administers the RSIP that includes a declining incentive block structure to deploy no more than 350 megawatts of new

²³ An Act Concerning a Green Economy and Environmental Protection

residential solar PV systems on or before December 31, 2022, while ensuring the sustained orderly development of a local state-based solar PV industry. The RSIP also requires that participating households undergo a Home Energy Solutions assessment, or equivalent audit. It should be noted that the Green Bank has also strategically sought to ensure that low-to-moderate income households have equal access to residential solar PV than non-low-to-moderate income households.²⁴ Through the Solar for All program, the Green Bank and its partners are enabling low-to-moderate income households to reach “solar parity” such that the proportion of solar PV installed on low-to-moderate income households is no less than non-low-to-moderate income households.

As of June ~~1, 2020, 326~~ megawatts of residential solar PV systems have been approved through RSIP, supporting ~~40,821~~ projects across the state and nearly \$~~1.24~~ billion of investment.²⁵

To support the Green Bank’s implementation of the RSIP, the EDCs are required to purchase the SHRECs to assist them in their compliance with the RPS. The SHREC price is established by the Green Bank to recover its costs for administering the RSIP through a 15-year MPA with the EDCs. The cash flow from the sale of current and future SHRECs produced by these systems can be sold as a “green bond”²⁶ to generate cash flow upfront to support the cost recovery of the program – see Figure 2.

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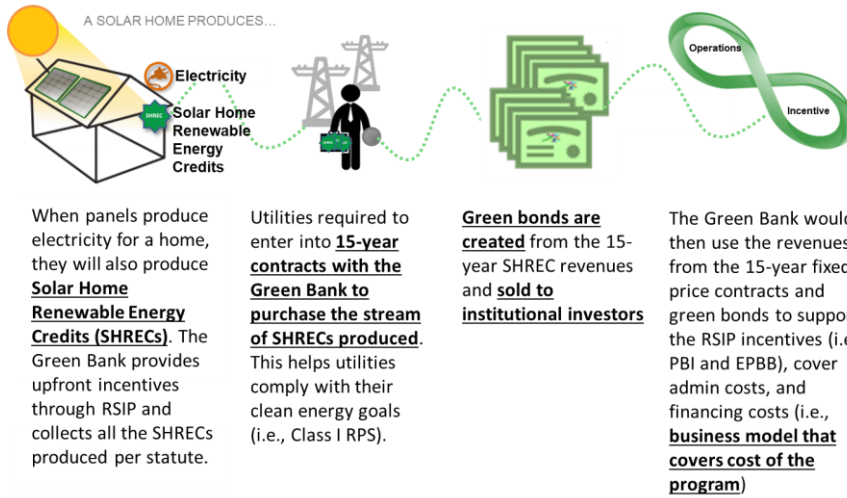
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²⁴ Sharing Solar Benefits – Reaching Households in Underserved Communities of Color in Connecticut by the Connecticut Green Bank (May 2019) – [click here](#).

²⁵ Prior to the RSIP, through incentives provided by the Connecticut Clean Energy Fund, the predecessor of the Green Bank, there are another 2,018 residential solar PV projects totaling 13.4 MW.

²⁶ <https://www.ctgreenbank.com/cgb-enters-green-bond-market/>

Figure 2. Incentive Program – Overview of the RSIP and the SHREC

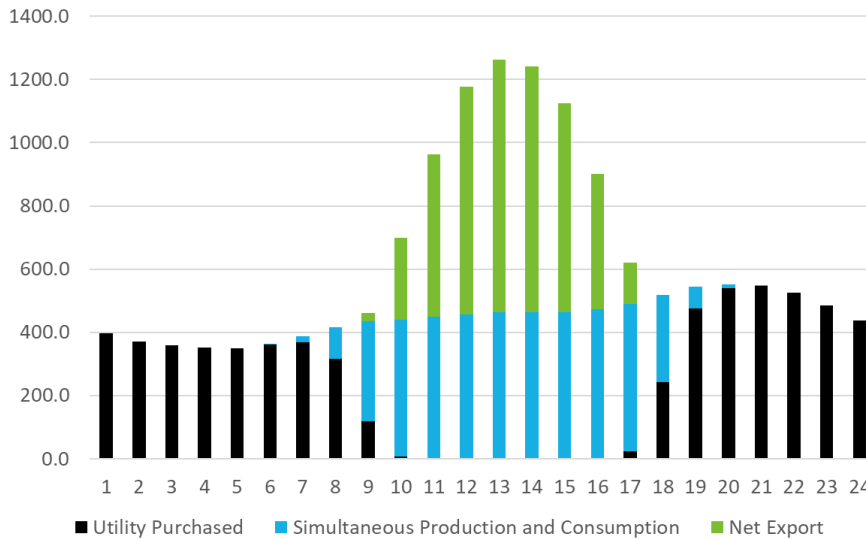


The Green Bank, through its partner C-Power, aggregates and registers residential solar PV systems in ISO-NE's On-Peak Hours Resource Program for which it receives Forward Capacity Market payments.²⁷

In general, over the course of a year, a typical residential solar PV system produces, and the household simultaneously consumes, about fifty percent of the production from the system – meaning that about fifty percent of the system's production is being exported to the grid – see Figure 3.

²⁷ <https://www.iso-ne.com/markets-operations/markets/forward-capacity-market>

Figure 3. Average Residential Consumption and Solar PV Production Over the Course of a Year by Hour of the Day



In order to store the system’s production that would have been exported to the grid for the purposes of later using it for (1) back-up power that would benefit the household, and/or (2) reducing demand, specifically peak demand, that would benefit all ratepayers, [in FY 2019](#), the Green Bank submitted an application into the Electric Efficiency Partners Program (EEPP) ([i.e., Docket No. 18-12-35](#)) demonstrating the “cost effectiveness” of residential solar PV in combination with battery storage.²⁸ [In FY 2021, the Green Bank will also be submitting into the Public Utility Regulatory Authority’s \(“PURA”\) Equitable Modern Grid process \(i.e., Docket No. 17-12-03\(RE03\), an incentive program with a focus on combined residential solar PV and battery storage.](#) In collaboration with DEEP and the EDCs through the Joint Committee,²⁹ efforts are being made to enable residential solar PV in combination with battery storage to deliver greater benefits to participating households as well as all ratepayers on the electric grid – [through a combination upfront incentive in support of passive demand response in conjunction with a performance-based incentive in support of active demand response.](#)

[The EnergizeCT Smart-E Loan in partnership with local community banks and credit unions, provides easy access to affordable capital for homeowners to finance energy, as well as health & safety, improvements on their properties through a partnership between local contractors and financial institutions, IPC, and the Green Bank. As the Green Bank provides credit enhancements to the Smart-E Loan in the form of interest rate buydowns \(i.e., subsidy\) and](#)

²⁸ Section 94 of Public Act 07-242

²⁹ Pursuant to Section 16-245m(d)(2) of the Connecticut General Statutes

loan loss reserves from its balance sheet, it is considered an incentive program since there is no direct financial return (e.g., principal and interest) to the organization like financing programs.

The Green Bank has set targets for its Incentive Programs business unit for FY 2020³⁰ and FY 2021 in terms of the number of projects, total investment (i.e., public and private), and installed capacity – see Tables 2 and 3.

Table 2. Revised FY 2020 Targets for the Incentive Programs Business Unit

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Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)
Residential Solar Investment Program	7,059	\$214.2	60,000
Solar for All Program	615	\$17.2	4,200
Electric Efficiency Partners Program ³¹	0-500	\$0.0-\$5.5	0-2,000
EnergizeCT Smart-E Loan	540	\$7.2	500
Total³²	8,099	\$226.9	62,500

Table 3. Proposed FY 2021 Targets for the Incentive Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Residential Solar Investment Program	2,824-4,706	\$85.9-\$143.2	24,000-40,000	
Solar for All Program	177-304	\$4.3-\$7.4	1,200-2,000	
Equitable Modern Grid ³³	0-400	\$0.0-\$3.5	0-2,000	
EnergizeCT Smart-E Loan	270-540	\$3.6-\$7.1		
Total³⁴	3,094-5,646	\$89.5-\$153.8	25,200-44,000	

Starting in FY 2021, the Green Bank has added annual GHG emissions avoided as a target for its Incentive Programs. It should be noted that there are two factors impacting the FY 2021

³⁰ Revised by the Board of Directors on January 24, 2020.

³¹ The Connecticut Green Bank has submitted a Technology Application (i.e., Docket No. 18-12-35) into PURA through the Electric Efficiency Partners Program in support of a residential battery storage incentive program that would retrofit existing residential solar PV systems installed through the RSIP. Beyond existing solar PV systems that could be retrofitted with battery storage, RSIP Step 15 proposes a combined residential solar PV and battery storage upfront incentive for new installations that demonstrates significant "cost effectiveness" of distributed energy systems. Meeting this target was contingent upon PURA's determination in Docket No. 18-12-35. There was not yet a determination by PURA in the docket, and therefore the revision.

³² The total does not count Solar for All projects separately because all Solar for All projects are also RSIP projects and therefore already counted.

³³ The Connecticut Green Bank will be submitting a proposal into Docket No. 17-12-03(RE03) – Electric Storage. Should the Request for Proposed Designs ("RFPD") be accepted by PURA, then the Green Bank would anticipate administering an upfront electric storage incentive program beginning January 1, 2021.

³⁴ The total does not count Solar for All projects separately because all Solar for All projects are also RSIP projects and therefore already counted.

targets for the RSIP – COVID-19 impacts on market demand and achieving the 350 MW target³⁵ – and therefore, the low and high range for the targets.

As a result of successfully achieving these targets, the Green Bank will reduce the energy burden on Connecticut families (including low-to-moderate income households and communities of color, as well as ratepayers by reducing demand, specifically peak demand, through the use of solar PV and battery storage), create jobs in our communities, raise tax revenues for the State of Connecticut, and reduce air pollution causing local public health problems and contributing to global climate change.

5. Financing Programs

The Green Bank manages financing programs. That is to say that it oversees financing programs that provide capital upfront to deploy clean energy, while at the same time returning principal and interest over time from the financing of projects, products, or programs to ensure the financial sustainability of the business unit.

The Green Bank has a number of clean energy financing products, including:

- **Commercial Property Assessed Clean Energy (“C-PACE”)**³⁶ – enables building owners to pay for clean energy improvements over time through a voluntary benefit assessment on their property tax bills. This process makes it easier for building owners to secure low-interest capital to fund energy improvements and is structured so that energy savings more than offset the benefit assessment.
- **Green Bank Solar PPA** – third-party ownership structure to deploy solar PV systems for commercial end-use customers (e.g., businesses, nonprofits, municipal and state governments, etc.) that uses a multi-year Power Purchase Agreement (“PPA”) to finance projects while reducing energy costs for the host customer.
- **Small Business Energy Advantage (“SBEA”)** – Eversource Energy administered on-bill commercial energy efficiency loan program for small businesses, in partnership with low-cost capital provided by Amalgamated Bank with a credit enhancements from the Green Bank (i.e., subordinated debt) and the Connecticut Energy Efficiency Fund (i.e., loan loss guaranty and interest rate buydown).
- **Multifamily Products** – defined as buildings with 5 or more units, the Green Bank provides a suite of financing options through IPC that support property owners to assess, design, fund, and monitor high impact clean energy and health & safety improvements for their properties.
- **Special Projects** – as opportunities present themselves, the Green Bank from time-to-time invests as part of a capital structure in various projects (e.g., fuel cell, hydropower, food waste to energy, LBE-ESA, etc.). These projects are selected based on the opportunity to expand the organization’s experience with specific technologies, advance

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³⁵ Given the devastating impacts of COVID-19 on the local solar industry, the Connecticut Green Bank is proposing an extension to the RSIP should there be a special session in 2020 that takes-up priorities from the Energy & Technology Committee – see April 24, 2020 Board of Directors meeting.

³⁶ CGS 16a-40g

economic development in a specific locale, or to drive adoption of clean energy that would otherwise not occur, while also earning a rate of return.

The Green Bank has set targets for its Financing Programs business unit for FY 2020³⁷ and FY 2021 in terms of the number of projects, total investment (i.e., public and private), and installed capacity – see Tables 4 and 5.

Table 4. Revised FY 2020 Targets for the Financing Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)
Commercial PACE	56	\$25.0	7,000
Green Bank Solar PPA	33	\$28.0	12,600
Small Business Energy Advantage ³⁸	1,000	\$20.0	-
Multifamily Predevelopment Loan	2	\$0.1	-
Multifamily Term Loan	8	\$1.3	200
Multifamily Catalyst Loan	2	\$0.1	-
Strategic Investments	2	\$7.5	-
Total	1,718	\$99.2	24,000

Table 5. Proposed FY 2021 Targets for the Financing Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Commercial PACE	33-48	\$15.2-\$23.3	5,300-7,100	
Green Bank Solar PPA	30-58	\$4.0-\$6.8	6,200-11,700	
Small Business Energy Advantage	1,203	\$20.4	-	
Multifamily Predevelopment Loan	1	\$0.1	-	
Multifamily Term Loan	2	\$0.2	0.1	
Multifamily Health & Safety	1	\$0.1	-	
Strategic Investments				
Total				

Starting in FY 2021, the Green Bank has added annual GHG emissions avoided as a target for its Financing Programs. Given the uncertain impacts of COVID-19, there are low and high range targets proposed.

³⁷ Revised by the Board of Directors on January 24, 2020

³⁸ In partnership with Eversource Energy and Amalgamated Bank, the Connecticut Green Bank provides capital in support of the utility-administered Small Business Energy Advantage program to provide 0% on-bill financing up to 4-years for energy efficiency projects.

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The capital provided by the Green Bank, which is a portion of the total investment, is expected to yield a return commensurate with the financial sustainability objectives of the organization and business unit.

As a result of successfully achieving these targets, the Green Bank will contribute to its financial sustainability, while also reducing the energy burden on Connecticut families and businesses, create jobs in our communities, raise tax revenues for the State of Connecticut, and reduce air pollution that cause local public health problems and global climate change.

6. Impact Investment

The Green Bank pursues investment strategies that advance market transformation in green investing while supporting the organization's pursuit of financial sustainability. With the mission 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 Green Bank leverages limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut.

6.1 State Funds

The Green Bank receives public capital from a number of ratepayer and state sources that it leverages to scale-up and mobilize private capital investment in the green economy of Connecticut.

System Benefit Charge – Clean Energy Fund

As its primary source of public capital, the Green Bank through CGS 16-245n(b) receives a 1 mill surcharge called the Clean Energy Fund ("CEF") from ratepayers of Eversource Energy and Avangrid. The CEF has been in existence since Connecticut deregulated its electric industry in the late 1990's.³⁹ On average, households contribute between \$7-\$10 a year for the CEF, which the Green Bank leverages to attract multiples of private capital investment in the green economy of Connecticut.⁴⁰

Regional Greenhouse Gas Emission Allowance Proceeds

As a secondary source of public capital, the Green Bank receives a portion (i.e., 23%) of Connecticut's Regional Greenhouse Gas Initiative ("RGGI") allowance proceeds through the Regulation of Connecticut State Agencies Section 22a-174(f)(6)(B). The Green Bank invests RGGI proceeds from the nation's first cap-and-trade program to finance clean energy improvements (i.e., renewable energy projects).

³⁹ Public Act 98-28 "An Act Concerning Electric Restructuring"

⁴⁰ The Clean Energy Fund should not be mistaken with the Conservation Adjustment Mechanism (or the Conservation and Loan Management Fund), which is administered by the EDCs

6.2 Federal Funds

The Green Bank receives public capital through a number of past, current, and future sources⁴¹ of federal funds as well that it leverages to scale-up and mobilize private capital investment in the green economy of Connecticut.

American Recovery and Reinvestment Act

Through the American Recovery and Reinvestment Act ("ARRA") the CCEF received \$20 million for its programs and initiatives. After nearly \$12 million of those funds were invested as grants, the Green Bank invested the remaining \$8.2 million in financing programs. With nearly \$2 million of ARRA funds left,⁴² the Green Bank invested over \$6.4 million of ARRA funds to attract and mobilize more than \$110 million of public and private investment in residential clean energy financing programs.

United States Department of Agriculture

The Green Bank is seeking to apply to the United States Department of Agriculture ("USDA") to seek access to low-cost and long-term federal loan funds for the deployment of clean energy in rural communities.⁴³ The USDA has vast lending authority under the Rural Electrification Act of 1936, which enables direct loans, project financing and loan guarantees to a variety of borrowers.

6.3 Green Bonds

The future of green bonds is growing in the U.S. Thus far in 2019, countries, companies, and local governments have sold nearly \$90 billion of green bonds that fund projects that are good for the environment.⁴⁴ In July of 2019, Connecticut Treasurer Shawn Wooden announced that the Clean Water Fund's Green Bond Sale shattered state records. The AAA-rated green bond had a record low interest rate of 2.69% and received retail investor orders topping \$240 million in one day! This is the highest level of retail investor orders (i.e., from Separately Managed Accounts (SMA's) or individuals) in the 20-year history of this program – with the balance of the bonds offered to institutional investors generating an additional \$128 million in orders.

Green Banks have an essential role in leveraging limited public funds with private capital to drive investment in the green economy to achieve climate change goals, create jobs in our communities, and reduce the burden of energy costs on our families and businesses. CGS Section 16-245n(d)(1)(C) is the enabling statute that allows the Green Bank to issue revenues bonds to support its purposes. Green Bonds are bonds whose proceeds are used for projects or activities with environmental or climate benefits, most usually climate change mitigation and adaptation.

⁴¹ There have been ongoing public policy proposals at the national level that the Connecticut Green Bank has been a part of to create a US Green Bank. If such a public policy were passed, then the Connecticut Green Bank would have access to significant federal funds to leverage to scale-up and mobilize private capital investment in the green economy of Connecticut.

⁴² As of July 1, 2019

⁴³ "Rural" communities are defined by a population bound and the various limits depend on the program; at the broadest, "rural" may be considered a town that has a population not greater than 50,000 people. Despite its positioning in a mostly-developed corridor, we estimate Connecticut would have 69% of towns eligible at the 20,000-person limit and 89% of towns at the 50,000-person limit.

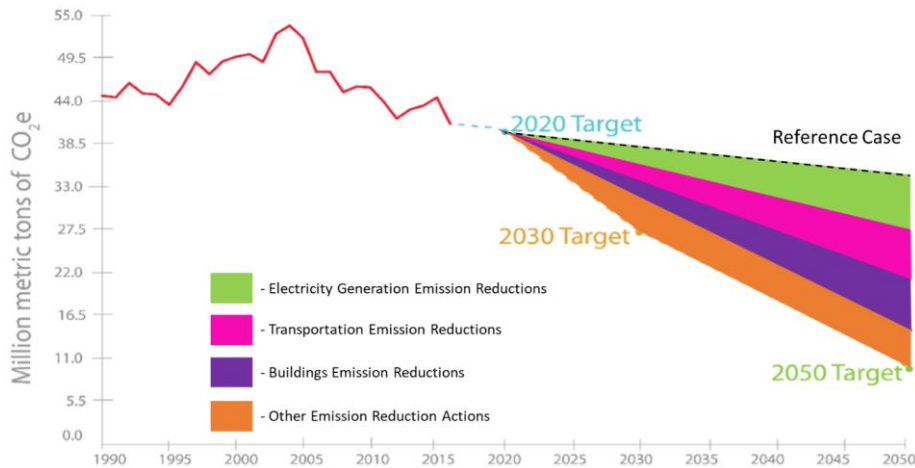
⁴⁴ "Green Bonds are Finally Sprouting Up All Over the Globe" by Brian Chappatta of Bloomberg News (June 18, 2019)

Connecticut's climate change plan⁴⁵ focuses on three mitigation wedges (see Figure 4), including:

- **Decarbonizing Electricity Generation** – representing 23% of Connecticut's economy-wide GHG emissions, electricity generation must be transitioned to zero-carbon renewable energy sources. Strategies include financing for in-state or regional utility-scale renewable energy resources (e.g., community solar, wind, run-of-the-river hydro, food-waste-to-energy, etc.) and financing and incentives for in-state distributed energy resources (e.g., behind the meter solar PV, battery storage, fuel cells, combined heat and power, etc.) that assist with the implementation of the Class I and III Renewable Portfolio Standard, Regional Greenhouse Gas Initiative, and other public policies. To ensure a sustainable downward trajectory to meet the State's 2050 target, electricity generation must be 66% and 84% carbon-free by 2030 and 2050, respectively.
- **Decarbonizing Transportation** – representing over 35% of Connecticut's economy-wide GHG emissions, the transportation sector is the largest source of statewide emissions and must be transitioned to zero- and low-carbon technologies. Strategies for zero- and low-carbon transportation include adopting innovative financing models for ZEV deployment (i.e., EVs and FCEVs) and ZEV charging infrastructure, ensuring equitable access to clean transportation options such as electric bus fleets and ride sharing or hailing services. Also important is supporting voluntary (e.g., carbon offset) and regulatory (e.g., Transportation Climate Initiative) markets for cleaner transportation that transitions us away from fossil fuel to renewable energy. More specifically, to meet the 2030 target, 20% of the passenger fleet and 30% of the heavy-duty fleet must be zero emission; and to meet the 2050 target, 95% of the passenger fleet and 80% of the heavy-duty fleet must be zero emission.
- **Decarbonizing Buildings** – representing over 30% of Connecticut's economy-wide GHG emissions, residential, commercial, and industrial buildings are the second largest emitting sector that must transition away from fossil fuels to renewable thermal technology. Strategies for zero-carbon buildings include financing and incentives for energy efficiency (e.g., thermal insulation, appliances, etc.) and renewable heating and cooling (e.g., air source heat pumps, ground source heat pumps, heat pump water heaters, etc.). To meet the economy-wide 2030 and 2050 targets for Buildings, renewable heating and cooling technologies must be significantly deployed to 11% and 26% for residential, and 9% and 20% for commercial, by 2030 and 2050 respectively.

⁴⁵ "Building a Low Carbon Future for Connecticut – Achieving a 45% GHG Reduction by 2030" recommendations from the Governor's Council on Climate Change (December 18, 2018)

Figure 4. Example of Key GHG Emission Reduction Measures (i.e., Mitigation Wedges) for Connecticut to Achieve Targets



The size of investment required and long-term revenue streams from clean energy, lend themselves well to bond structures. Issuing green bonds can provide the Green Bank a lower-cost, longer-term source of capital, enabling the Green Bank to further leverage state and federal funds to increase its impact in Connecticut by attracting and mobilizing private investment in the state’s green economy. The Green Bank has an important role to play in advancing green bonds in the U.S., especially given its history of engaging citizens and communities and its expertise in developing impact methodologies and a thorough and transparent reporting framework.

7. Citizen Engagement

The Green Bank, and its predecessor the Connecticut Clean Energy Fund (CCEF), have a long-standing history of citizen engagement within the communities of Connecticut. In 2002, the CCEF partnered with six private foundations⁴⁶ to co-found SmartPower – which launched the 20 percent by 2010 campaign and led the administration of the CCEF’s EPA award-winning Connecticut Clean Energy Communities Program.⁴⁷ Then in 2013, the Green Bank launched a series of Solarize campaigns in communities across the state in partnership with SmartPower and the Yale Center for Business and the Environment,⁴⁸ while also advancing the SunShot Initiative of the U.S. Department of Energy (DOE) in partnership with the Clean Energy States Alliance through projects that reduce soft-costs for solar PV (i.e., customer acquisition,

⁴⁶ Emily Hall Tremaine Foundation, The John Merck Fund, Pew Charitable Trust, The Oak Foundation, Rockefeller Brothers Fund, and Surdna Foundation

⁴⁷ “Climate Policy and Voluntary Initiatives: An Evaluation of the Connecticut Clean Energy Communities Program,” by Matthew Kotchen for the National Bureau of Economic Research (Working Paper 16117).

⁴⁸ “Solarize Your Community: An Evidence-Based Guide for Accelerating the Adoption of Residential Solar” by the Yale Center for Business and the Environment.

permitting, and financing) and provide better access to solar PV for low-to-moderate income households.

Engaging citizens has been in the DNA of the Green Bank since its inception.

7.1 Green Bonds US® Campaign

From the air we breathe to the products we consume; the world's population is inescapably connected. And while that may present challenges in the context of global climate change, it also affords incredible opportunities for collaboration and progress.

Whether through markets or within communities, the Connecticut Green Bank is bringing people together and strengthening the bonds we share with one another. As its name suggests, the "Green Bonds US" campaign, seeks to promote a simple but critically important message; green brings us together, green bonds us. The multimedia, brand awareness and green-bond promotional campaign will promote the benefits of green energy, as well as a brand-new green energy investment opportunity provided by the Green Bank.

Mini Bonds

Despite the rising demand for green energy in the state, barriers still exist that may prevent more people from participating in Connecticut's growing green economy. For example, a homeowner who, despite having a strong desire to "go solar", is not able to because of factors like price, siting, or other issues. To allow more people to benefit from, and invest in, green energy, the Green Bank is offering another way. For the first time in its history, the Green Bank will issue "mini" green-bonds (e.g., small denomination bonds, certificate of deposits, and/or other fixed income investments) for sale to institutions and retail investors (i.e., SMAs and individuals). Launching as a pilot program, the mini-bonds represent another step forward on the path to inclusive prosperity.

Market Research

To gauge the public's interest and assess market demand for mini-green-bonds, the Green Bank performed primary and secondary research such as an online survey, interviews with industry professionals, as well as internal review of recent market data and investment reports.

In June of 2019, the Green Bank engaged GreatBlue Research to conduct primary research throughout Connecticut, measuring the market potential for "mini-bonds". A digital survey was sent to two target audiences: 1.) households that have installed solar PV through the RSIP and 2.) the general population (i.e., households that haven't participated in a Green Bank program). When asked "what types of green projects would you support through your private investments," the survey participants had the following responses:

- Recycling and waste reduction – 69.5%
- Clean water – 67.3%
- Roof-top solar – 64.5%
- High efficiency heating and cooling systems – 58.8%
- Home energy efficiency projects – 56.7%

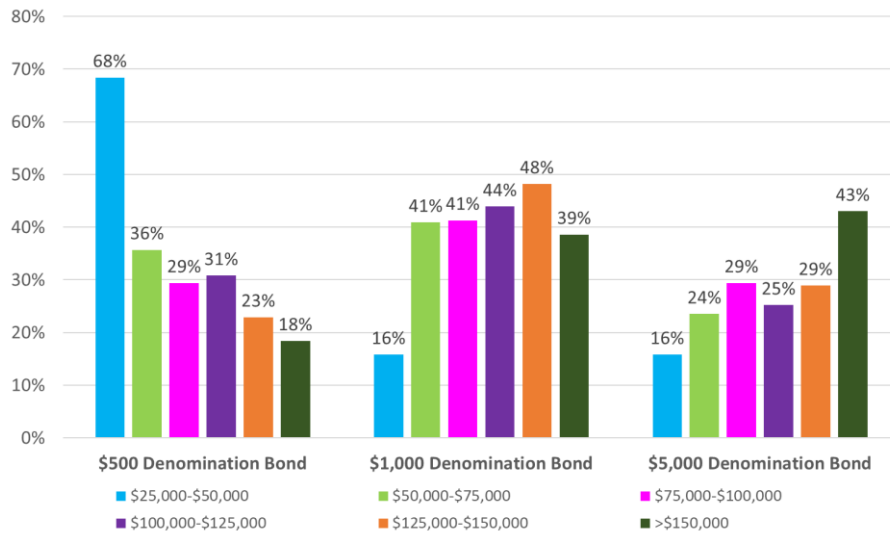
- Land conservation – 49.3%
- Energy efficiency appliance rebates – 45.6%
- Electric vehicles – 41.2%

The Green Bank and GreatBlue research also highlighted that the income of the investor, alongside the denomination of the bond, represents an opportunity for increasing equitable access to greater investment in the environment – see Figure 5.

After taking into account the results of our state-wide primary research, current national trends and conversations with various industry experts, there is sufficient data to suggest that the green bond market for individual investors in Connecticut may be quite large. As a result, the Green Bank intends to issue mini-green-bonds, with proceeds going to support the development of green energy projects within Connecticut.

For more information on the Green Bonds US campaign, visit www.greenbondsus.com

Figure 5. Comparison of Interest in Bond Denomination Value by Income of Survey Respondents



7.2 Sustainable CT

Sustainable CT and the Green Bank are developing an engagement and investment platform to raise capital in support of local projects that provide individuals, families, and businesses with investment opportunities to make an impact on sustainability in their communities. The partnership between Sustainable CT and the Green Bank is focused on the following key priorities:

- Driving investment in projects in our communities, with a goal to accelerate over time;
- Community-level engagement, from project origination through financing, that is inclusive, diverse, and “knitted”;
- Creating a structure that harnesses all types of capital for impact – from donations to investment;
- Developing a business model that covers the cost of the program; and
- Creating a measurable impact, both qualitative and quantitative.

Through a partnership between Sustainable CT and IOBY (In Our Backyard), an online crowdfunding platform will enable citizen leaders to have access to financial resources that they need for local sustainability projects.

For more information on Sustainable CT, visit www.sustainablect.com

8. Evaluation Framework and Impact Methodologies

The Green Bank’s evaluation efforts seek to understand how the increase in investment and deployment of clean energy supported through the Green Bank, result in benefits to society. To that end, the Green Bank has devised an Evaluation Framework and impact methodologies for various societal benefits.

8.1 Evaluation Framework

The Green Bank has established an Evaluation Framework to guide the assessment, monitoring and reporting of the program impacts and processes, including, but not limited to energy savings and clean energy production and the resulting societal impacts or benefits arising from clean energy investment.⁴⁹ This framework focuses primarily on assessing the market transformation the Green Bank is enabling, including:

- **Supply of Capital** – including affordable interest rates, longer term maturity options, improved underwriting standards, etc.
- **Consumer Demand** – increasing the number of projects, increasing the comprehensiveness of projects, etc.
- **Financing Performance Data and Risk Profile** – making data publicly available to reduce perceived technology risks by current or potential private investors.
- **Societal Impact** – the benefits society receives from more investment and deployment of clean energy.

With the goal of pursuing investment strategies that advance market transformation in green investing, the Green Bank’s evaluation framework provides the foundation for determining the impact it is supporting in Connecticut and beyond.

⁴⁹ <https://ctgreenbank.com/wp-content/uploads/2017/02/CTGreenBank-Evaluation-Framework-July-2016.pdf>

8.2 Green Bond Framework

The Green Bank's Green Bond Framework ("Framework")⁵⁰ provides a structure in which the Green Bank can more efficiently and effectively support its efforts to raise capital and deploy more clean energy through the issuance of green bonds.

Connecticut has been at the forefront of state-level efforts to combat the threat of global climate change. In order to increase investment to meet the 10x goals identified by the United Nations as the level needed to hold off the worst effects of climate change, the Green Bank will use its statutory authority (i.e., CGS 16-245kk) to issue bonds, including Green Bonds. These are key to sourcing capital for clean energy projects and providing a way for all residents, businesses, and institutions of Connecticut to invest in growing our green economy.

The Framework sets out how the Green Bank proposes to use its Master Trust Indenture ("MTI") in a manner consistent with its purpose and provide the transparency and disclosures investors require to make investment decisions through green bonds. This Framework is specifically intended for the MTI approved and adopted April 22, 2020, which establishes the purposes for which the Green Bank may issue green bonds or other public debt. The Framework is established in accordance with the Climate Bonds Initiative ("CBI") Standard and adheres to the Green Bond Principles issued by the International Capital Market Association.

8.3 Impact Methodologies

To support the implementation of the Evaluation Framework, the Green Bank, working with various public sector organizations, has developed methodologies that estimate the impact from the investment, installation and operation of clean energy projects, including:

- **Jobs** – working in consultation with the Connecticut Department of Economic and Community Development ("DECD"), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the direct, indirect, and induced job-years resulting from clean energy deployment.⁵¹
- **Tax Revenues** – working in consultation with the Connecticut Department of Revenue Services ("DRS"), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the individual income, corporate, and sales tax revenues from clean energy deployment.⁵²
- **Environmental Protection** – working in consultation with the United States Environmental Protection Agency ("EPA") and DEEP, the Green Bank devised a methodology that takes the reduction in consumption of energy and increase in the

⁵⁰ https://ctgreenbank.com/wp-content/uploads/2020/04/CGB_Green-Bond-Framework_final-4-22-2020.pdf

⁵¹ https://www.ctgreenbank.com/wp-content/uploads/2018/03/CGB_DECD_Jobs-Study_Fact-Sheet.pdf

⁵² <https://www.ctgreenbank.com/wp-content/uploads/2018/09/CGB-Eval-Tax-Methodology-7-24-18.pdf>

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production of clean energy to reasonably estimate the air emission reductions (i.e., CO₂, NO_x, SO₂, and PM_{2.5}) resulting from clean energy deployment.⁵³

- **Public Health Improvement** – working in consultation with the EPA, DEEP, and the Connecticut Department of Public Health (“DPH”), the Green Bank devised a methodology that takes air emission reductions to reasonably estimate the public health benefits (e.g., reduced hospitalizations, reduced sick days, etc.) and associated savings to society resulting from clean energy deployment.⁵⁴

Each year, the Green Bank develops additional methodologies that value the impact the Green Bank is helping create in Connecticut and all of society. For more information on the Green Bank’s impact methodologies, visit the Impact page of the website.⁵⁵ [In FY 2020 and FY 2021, the Green Bank is developing its Equity and Energy Burden impact methodologies to accompany its Economy and Environmental methodologies.](#)

The Green Bank’s efforts to increase investment in and deployment of clean energy projects – which result in increased benefits to Connecticut and all of society – can also be looked at through the lens of the United Nation’s Sustainable Development Goals (“UNSDG’s”).⁵⁶ The UNSDG’s include, but are not limited to – reducing poverty, improving health and well-being, making clean energy affordable, increasing economic development, reducing inequalities, supporting sustainable communities, and confronting climate change – areas where the Green Bank is measuring (or will measure) the impacts of its investments.

9. Reporting and Transparency

The Green Bank has extensive reporting on its financial management and societal impact through various mechanisms. As an administrator of ratepayer (i.e., Clean Energy Fund) and taxpayer (e.g., Regional Greenhouse Gas Initiative) resources, the Green Bank believes that complete transparency is important to ensure the public’s continued trust in serving its purpose.

9.1 Comprehensive Annual Financial Report (CAFR)

A Comprehensive Annual Financial Report (“CAFR”) is a set of government financing statements that includes the financial report of a state, municipal or other government entity that complies with the accounting requirements promulgated by the Governmental Accounting Standards Board (“GASB”). GASB provides standards for the content of a CAFR in its annually updated publication *Codification of Governmental Accounting and Financial Reporting Standards*. A CAFR is compiled by a public agency’s accounting staff and audited by an external American Institute of Certified Public Accountants (“AICPA”) certified accounting firm utilizing GASB requirements. It is composed of three sections – Introductory, Financial, and Statistical. The independent audit of the CAFR is not intended to include an assessment of the financial health

⁵³ <https://www.ctgreenbank.com/wp-content/uploads/2018/01/CGB-Eval-IMPACT-091917-Bv2.pdf>

⁵⁴ <https://www.ctgreenbank.com/wp-content/uploads/2018/03/CGB-Eval-PUBLICHEALTH-1-25-18-new.pdf>

⁵⁵ <http://www.ctgreenbank.com/strategy-impact/impact/>

⁵⁶ <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

of participating governments, but rather to ensure that users of their financial statements have the information they need to make those assessments themselves.⁵⁷

To date, the Green Bank has issued five CAFR's, including:

- [Fiscal Year Ended June 30, 2014 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2015 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2016 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2017 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2018 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2019](#)

As the “gold standard” in government reporting, the CAFR is the mechanism the Green Bank uses to report its fiscal year financial and investment performance – including societal benefits and impacts – to its stakeholders. For each of its five years filing the CAFR with the Government Finance Officers Association the Green Bank has received a Certificate of Achievement for Excellence in Financial Reporting.⁵⁸

9.2 Annual Report

Beyond the CAFR, the annual reports of the Green Bank are compiled by the marketing staff and include consolidated financial statement information and narratives of various program achievements in a condensed format that can be widely distributed.

To date, the Green Bank has issued seven annual reports, including:

- [Fiscal Year 2012 Annual Report](#)
- [Fiscal Year 2013 Annual Report](#)
- [Fiscal Year 2014 Annual Report](#)
- [Fiscal Year 2015 Annual Report](#)
- [Fiscal Year 2016 Annual Report](#)
- [Fiscal Year 2017 Annual Report](#)
- [Fiscal Year 2018 Annual Report](#)
- [Fiscal Year 2019 Annual Report](#)

9.3 Auditors of Public Account

The office of the Auditors of Public Accounts (“APA”) is a legislative agency of the State of Connecticut whose primary mission is to conduct audits of all state agencies, including quasi-public agencies. Included in such audits is an annual Statewide Single Audit of the State of

⁵⁷ The Government Finance Officers Association (GFOA), founded in 1906, represents public finance officials throughout the United States and Canada. GFOA’s mission is to enhance and promote the professional management of governmental financial resources by identifying, developing, and advancing fiscal strategies, policies, and practices for the public benefit. GFOA established the Certificate of Achievement for Excellent in Financial Reporting Program (CAFR Program) in 1945 to encourage and assist state and local governments to go beyond the minimum requirements of generally accepted accounting principles to prepare comprehensive annual financial reports that evidence the spirit of transparency and full disclosure and then to recognize individual governments that succeed in achieving that goal.

⁵⁸ [GAO has vet to designate the FY 2019 CAFR with a Certificate of Achievement](#)

Connecticut to meet federal requirements. The office is under the direction of two state auditors appointed by the state legislature. The APA audited certain operations of the Connecticut Green Bank in fulfillment of its duties under Sections 1-122 and Section 2-90 of the Connecticut General Statutes.

To date, the APA has conducted two audits, including:

- [Fiscal Years 2012 and 2013](#)
- [Fiscal Years 2014 and 2015](#)

9.4 Open Connecticut and Open Quasi

Open Connecticut centralizes state financial information to make it easier to follow state dollars. In Connecticut quasi-public agencies are required to submit annual reports to the legislature, including a summary of their activities and financial information. In addition to that, the Comptroller's office requested that quasi-public agencies voluntarily provide **payroll and** checkbook-level vendor payment data for display on Open Connecticut. The Green Bank, which was among the first quasi-public organizations to participate, has voluntarily submitted this information since the inception of Open Connecticut.⁵⁹ [In June of 2020, the Comptroller launched Open Quasi, which provides payroll and checkbook level data for all quasi-public organizations in Connecticut.](#)

9.5 Stakeholder Communications

The Green Bank holds quarterly stakeholder webinars to update the general public on the progress it is making with respect to its Comprehensive Plan and annual targets.⁶⁰ Through these webinars, the Green Bank staff invite questions from the audience. These webinars are announced through the Green Bank's list serve consisting of thousands of stakeholders as well as the events page of its website.⁶¹

The Green Bank also issues an e-newsletter through its list serve that provides key topics in the news and important information on products, programs and services.⁶²

10. Research and Product Development

As the Green Bank implements its Comprehensive Plan, there will be ongoing efforts to develop new market opportunities for future green investments. With the lessons being learned and best practices being discovered in the green economy, the Green Bank's ability to deliver more societal benefits requires understanding potential opportunities and the development of pilot programs and initiatives to increase impact, including, for example:

⁵⁹ <https://openquasi.ct.gov/>,

⁶⁰ <https://www.ctgreenbank.com/news-events/webinars/>

⁶¹ <https://www.ctgreenbank.com/news-events/events-calendar/>

⁶² <https://www.ctgreenbank.com/newsletters/>

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- **Shared Clean Energy Facilities** – to support decarbonizing the electricity infrastructure climate change wedge, while reducing the burden of energy costs on Connecticut’s families and businesses, the Green Bank will seek to apply its experience administering the RSIP to supporting and investing in shared clean energy facilities (or community solar projects) with a focus on low-to-moderate income families;
- **Energy Burden from Transportation** – as Operation Fuel has done an exceptional job quantifying the energy burden for electricity use and heating of homes, understanding the energy burden from transportation (i.e., gasoline to alternative fuel vehicles) will help the Green Bank and others (e.g., Department of Housing, Connecticut Housing and Finance Authority, Partnership for Strong Communities, DEEP, etc.) understand its role in addressing the decarbonization of transportation emissions climate change wedge; and
- **Environmental Infrastructure** – if there were an expansion of scope for the Green Bank beyond “clean energy,” the Green Bank could apply the green bank model to mobilize private investment in “environmental infrastructure”.⁶³ Working with DEEP and other state agencies, local governments, nonprofit organizations, academic institutions, and businesses, the Green Bank could, for example, identify new areas for increased investment in climate change adaptation and resiliency through the issuance of green bonds.⁶⁴

The Green Bank’s research product development efforts are intended to open-up new market channels for private investment in Connecticut’s green economy through studies, pilot projects, and other initiatives that have the potential for expanding the impact of the Green Bank.

11. Budget

11.1 FY 2020 Budget

For the details on the FY 2020 budget– [click here](#).

For details on the FY 2019 to FY 2020 variance analysis supporting the continuation of the Sustainability Plan – [click here](#).

11.2 FY 2021 Budget

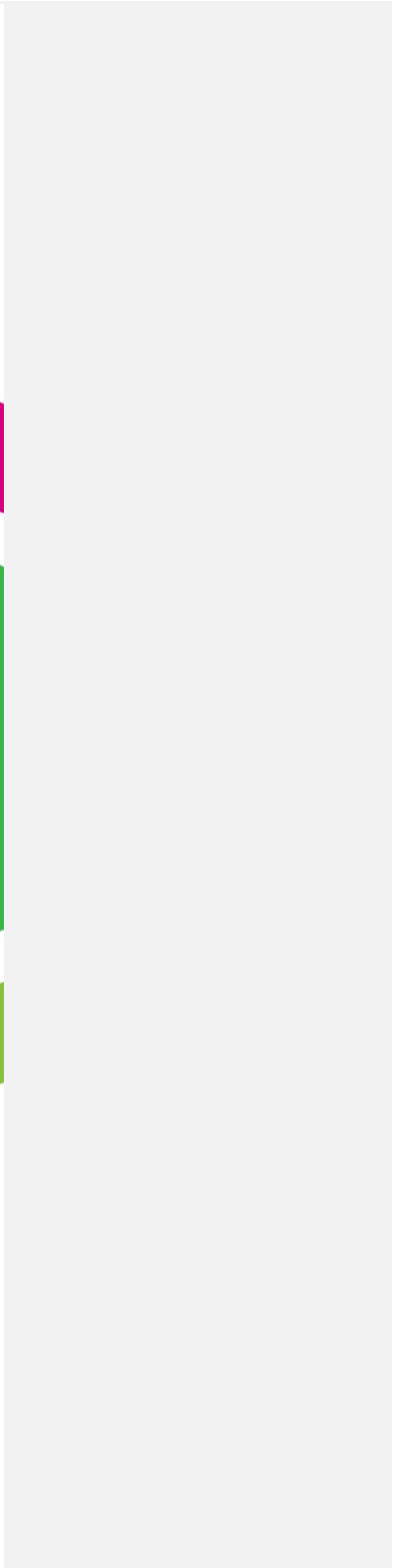
[For the details on the FY 2021 budget– click here.](#)

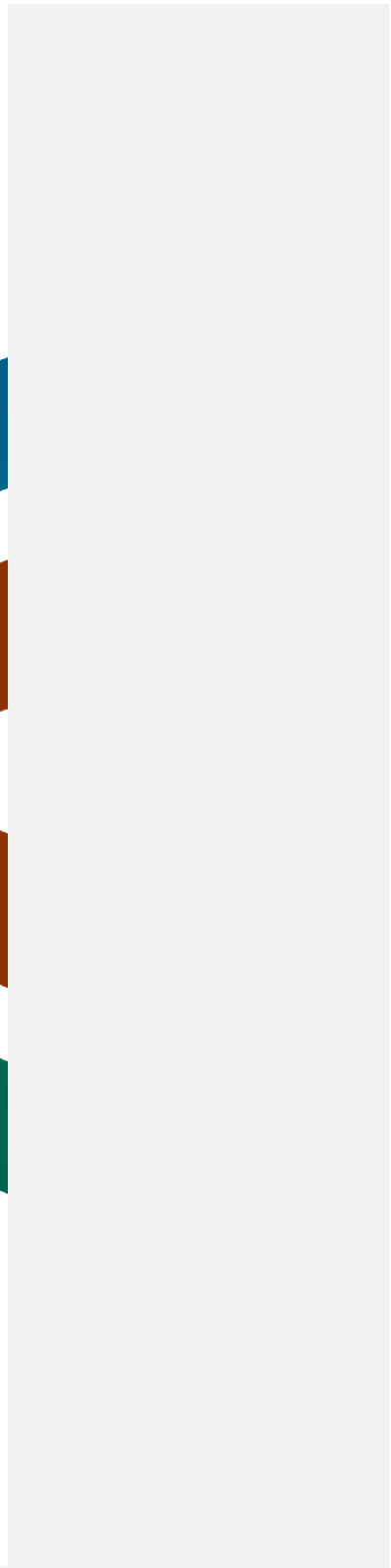
⁶³ Proposed Senate Bill 927 in the 2019 Legislative Session

⁶⁴ Section 10.3 Sustainability of the Comprehensive Plan of the Connecticut Green Bank for FY 2017 through FY 2019 recognizes that other green banks invest beyond “clean energy” and include “environmental infrastructure”.



 HARVARD Kennedy School
ASH CENTER
for Democratic Governance
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CONNECTICUT
GREEN BANKSM

845 Brook Street
Rocky Hill, CT 06067

| 300 Main Street, 4th Floor
Stamford, CT 06901