



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

Meeting Date

December 15, 2021



JOINT CGB/EEB COMMITTEE MEMBERS

Brenda Watson

Chair
Executive Director
Operation Fuel

Victoria Hackett

Vice Chair
CT Department of Energy and
Environmental Protection (DEEP)

John Harrity

Chair
CT Roundtable on Climate and Jobs

John Viglione

Office of Consumer Counsel

Bryan Garcia

President and CEO
Connecticut Green Bank

Bert Hunter

EVP/CIO Finance
Connecticut Green Bank

Steve Bruno

Eversource

Joel Kopylec

United Illuminating



AGENDA

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

Online

December 15, 2021

1:30 pm – 3:00 pm

1. Call to Order
2. Public Comments (5 min)
3. Board Matters – Welcome New Member and Chair Nomination and Election (5 min)
4. Review and Approval of Minutes for June 16, 2021 (2 min)
5. Joint Committee – Regular Meeting Schedule for 2022 (3 min)
6. Clean Energy Jobs Report 2021 – Release Plan (10 min)
7. Plan Coordination (15 min)
 - a. Input to FY 2022 Connecticut Green Bank Comprehensive Plan (Revisions)
 - b. 2022-2024 Conservation and Load Management Plan
8. Equitable Modern Grid Framework – Overview by PURA (30 minutes)
9. Plans for the 2022 Legislative Session (5 min)
10. Other Business (10 min)
 - a. Brief Update: C&I - Government
 - b. Brief Update: C&I – Small and Medium/Large Business
 - c. Brief Update: Residential – Single Family and Multi-Family
11. Adjourn

Join the meeting online at <https://global.gotomeeting.com/join/607905637>

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RESOLUTIONS

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

Online

December 15, 2021
1:30 pm – 3:00 pm

1. Call to Order
2. Public Comments (5 min)
3. Board Matters – Welcome New Member and Chair Nomination and Election (5 min)

Resolution #1

Resolved that Brenda Watson has been elected by the Joint Committee in accordance with its bylaws to serve as its Chairperson.

Resolution #2

Resolved that Vicki Hackett has been elected by the Joint Committee in accordance with its bylaws to serve as its Vice Chairperson.

4. Review and Approval of Minutes for June 16, 2021 (2 min)

Resolution #3

Motion to approve the meeting minutes of the Joint Committee for June 16, 2021

5. Joint Committee – Regular Meeting Schedule for 2022 (3 min)

Resolution #4

Motion to approve the 2022 Regular Schedule of Meetings

6. Clean Energy Jobs Report 2021 – Release Plan (10 min)
7. Plan Coordination (15 min)

- a. Input to FY 2022 Connecticut Green Bank Comprehensive Plan (Revisions)
- b. 2022-2024 Conservation and Load Management Plan

8. Equitable Modern Grid Framework – Overview by PURA (30 minutes)
9. Plans for the 2022 Legislative Session (5 min)
10. Other Business (10 min)
 - a. Brief Update: C&I - Government
 - b. Brief Update: C&I – Small and Medium/Large Business
 - c. Brief Update: Residential – Single Family and Multi-Family
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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** – we continue to record and post the board meetings.
- **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

December 15, 2021



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Agenda Item #1

Call to Order



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Agenda Item #2

Public Comments



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Agenda Item #3

Board Matters – Welcome New Member and
Nomination and Elections

Welcome



Vicki Hackett

DEEP

Deputy Commissioner of Energy

Nomination and Elections



Brenda Watson
Operation Fuel
Chair



Vicki Hackett
DEEP
Vice Chair

Resolutions #1 and #2

Resolution #1

Resolved that Brenda Watson has been elected by the Joint Committee in accordance with its bylaws to serve as its Chairperson.

Resolution #2

Resolved that Vicki Hackett has been elected by the Joint Committee in accordance with its bylaws to serve as its Vice Chairperson.



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Agenda Item #4

Approval of Meeting Minutes for June 16, 2021

Resolution #3

Resolution #3

Motion to approve the meeting minutes of the Joint Committee for June 16, 2021



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Agenda Item #5

Regular Meeting Schedule for 2022

Joint Committee

Regular Meeting Schedule for 2022

- **March 16, 2022** – initial input into FY 2023 Comprehensive Plan of CGB and input into CY 2023 C&LMP
- **June 22, 2022** – final input into FY 2023 Comprehensive Plan of CGB and CY 2023 C&LMP
- **September 14, 2022** – debrief of 2022 legislative session
- **December 14, 2022** – plans for 2023 legislative session and input into FY 2023 Comprehensive Plan of CGB (Revisions)

Resolution #4

Resolution #4

Motion to approve the 2022 Regular Schedule of Meetings



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Agenda Item #6

Clean Energy Jobs Report 2021

Release of Plan

Connecticut Clean Energy Industry Report

Continuing to Report Progress

July
20
20

Connecticut Clean Energy Industry Report



September
2021

Connecticut Clean Energy Industry Report



Clean Energy Industry Report Release of Plan

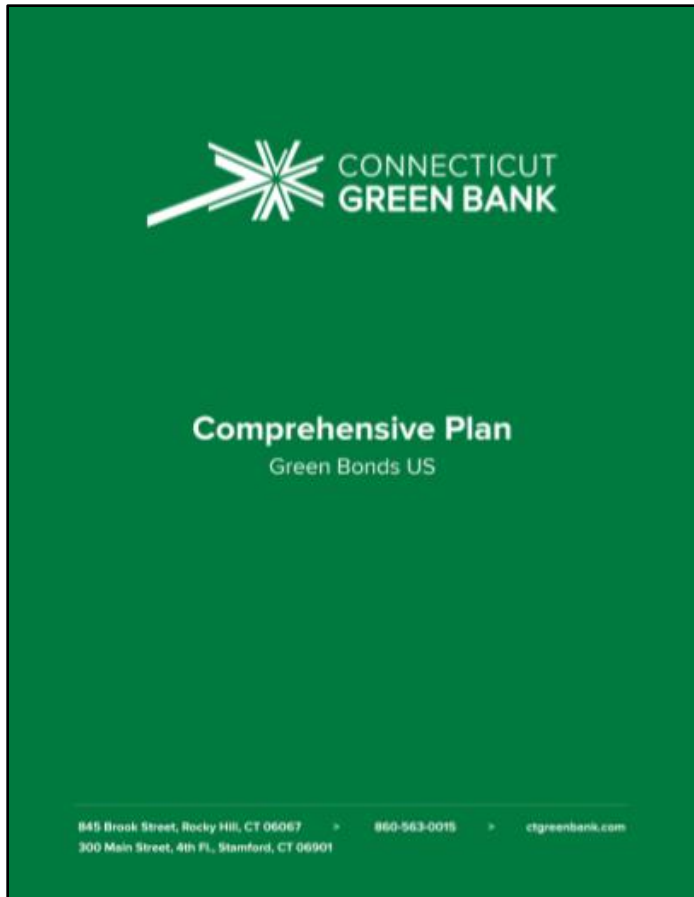
- **Press Release** – draft a press release for the release of the report – what is the timing of the release?
- **Webinar** – work with [bw] Research Partnerships to see if they would be willing to do a webinar on the report with the Green Bank and EDCs
- **2022 Report** – continue collaboration through Joint Committee with DEEP, EDCs and Green Bank to support report for FY 2022 with [bw] Research Partnerships
- Other Ideas?



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Agenda Item #7a
Connecticut Green Bank
Comprehensive Plan – Green Bonds US
(Revisions)

Connecticut Green Bank Comprehensive Plan – Green Bonds US



- **Transition Year**
 - Onboard new BOD and Committee members
 - Conclusion of the RSIP (i.e., 350 MW)
 - Inclusion of battery storage incentive program (i.e., 580 MW)
 - Development of environmental infrastructure (i.e., Comprehensive Plan)
- Established target by 2025 no less than 40% of investment and benefits to vulnerable communities
- Continuation of Green Liberty Bonds and expansion to include Green Liberty Notes
- Engagement with Federal Government – Infrastructure and Jobs Act and BBBA (?)



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Agenda Item #7b

Conservation and Loan Management Plan Reviews and Input

2024 Plan Priorities

■ Energy Affordability

- Reducing the energy burden on customers and promoting economic development through lower energy bills, enhanced energy security, and increased reliability

■ Decarbonization

- Supporting high efficiency, low-carbon technologies to reduce greenhouse gas emissions from the building sector to meet legislative/regulatory emission and climate change goals

■ Equity

- Equitable distribution of benefits of energy efficiency and active demand response programs across state, communities, market segments, and customer types



Significant Stakeholder Input

Board Public Input Sessions and DEEP C&LM Technical Hearings and Public Input Session were very well attended

- Several reoccurring themes
 - Support for electrification and heat pumps
 - Cease support for fossil fuel-fired equipment
 - More accessible/transparent C&LM Plan development process
 - Clearer quantifiable goals and metrics
 - Need for increased workforce development
 - Reaching underserved and burdened customers

C&LM Plan Review Process

- **November 1:** 2022-2024 C&LM Plan filed with DEEP
- **November 3:** DEEP issues Requests for Information to Utilities (responses submitted November 12 & 16)
- Public Meetings:
 - **November 16** – Technical Meeting
 - **November 17** – Public Input Session
 - **November 18** – Technical Meeting
- **November 30:** DEEP issues second Requests for Information to Utilities (responses submitted December 9)
- **December 3:** Written comments due
- DEEP drafts Determination on 2022-2024 C&LM Plan
- Public comments on Draft Determination
- DEEP issues Final Determination

2022-2024 C&LM Plan

\$707 million investment in energy efficiency

Every \$1 invested in energy efficiency results in a \$2.61 return in benefits

Electric lifetime savings of 4.7 billion kilowatt-hours (kWh)

Natural gas lifetime savings of 23.9 billion cubic feet of natural gas (Bcf)

Oil lifetime savings of 80.3 million gallons

Propane lifetime savings of 14.1 million gallons

Combined annual peak demand reduction (active and passive) of 395 Megawatts (MW)



Savings & Benefits

Year	Budgets (\$000)			Annual Savings							Lifetime Savings	
	Electric	Natural Gas	Total	Electric (GWh)*	Peak (MW)**	Natural Gas (MMcf)	Oil (gallons)	Propane (gallons)	Annual Savings (MMBtus)*	CO ₂ Emissions (tons)	Lifetime Benefit (\$000)	Lifetime Savings (MMBtus)***
2022	\$189,054	\$54,231	\$243,284	190	125	528	1,448,963	277,276	1.4	133,066	\$606,205	18.3
2023	\$178,385	\$55,179	\$233,564	169	131	541	1,378,837	258,524	1.3	125,098	\$569,530	17.5
2024	\$173,895	\$55,836	\$229,731	156	139	540	1,363,332	254,614	1.3	119,724	\$549,406	17.1
Total	\$541,333	\$165,246	\$706,579	516	395	1,609	4,191,132	790,415	4.1	377,889	\$1,725,141	53.0

*Abbreviation for Gigawatt hours.

**Savings include demand response programs.

***In millions of MMBtu (one million British Thermal Units). Figures listed are site MMBtus and address only the energy saved at the meter level.

Areas for C&LM Plan and CT Green Bank Coordination

Per Phase 1 Equity in Energy Efficiency Proceeding Goal 7:

- *Action 7.1: Work with the CT Green Bank to explore improved financing options for Home Energy Solutions (HES) and HES-Income Eligible customers to access interest-free financing for health and safety barrier mitigation.*
- Continuing to integrate storage and renewables into current program offers
 - Combine with new construction all-electric offers
 - Pairing of HPs with PV (and storage?)
- Joint evaluation of financing activities?



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Agenda Item #8

Equitable Modern Grid Initiative Overview

Equitable Modern Grid Initiative

Presentation to the Joint Committee

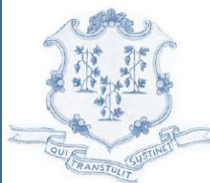
Joshua Ryor
Director, Utility Programs and Initiatives
Connecticut Public Utilities Regulatory Authority

December 15, 2021



Equitable Modern Grid Framework

On October 2, 2019 PURA released its
Framework for an Equitable Modern Grid
in Docket No. 17-12-03



STATE OF CONNECTICUT PUBLIC UTILITIES REGULATORY AUTHORITY

For Immediate Release

Connecticut Public Utilities Regulatory Authority Announces Landmark Equitable Modern Grid Framework

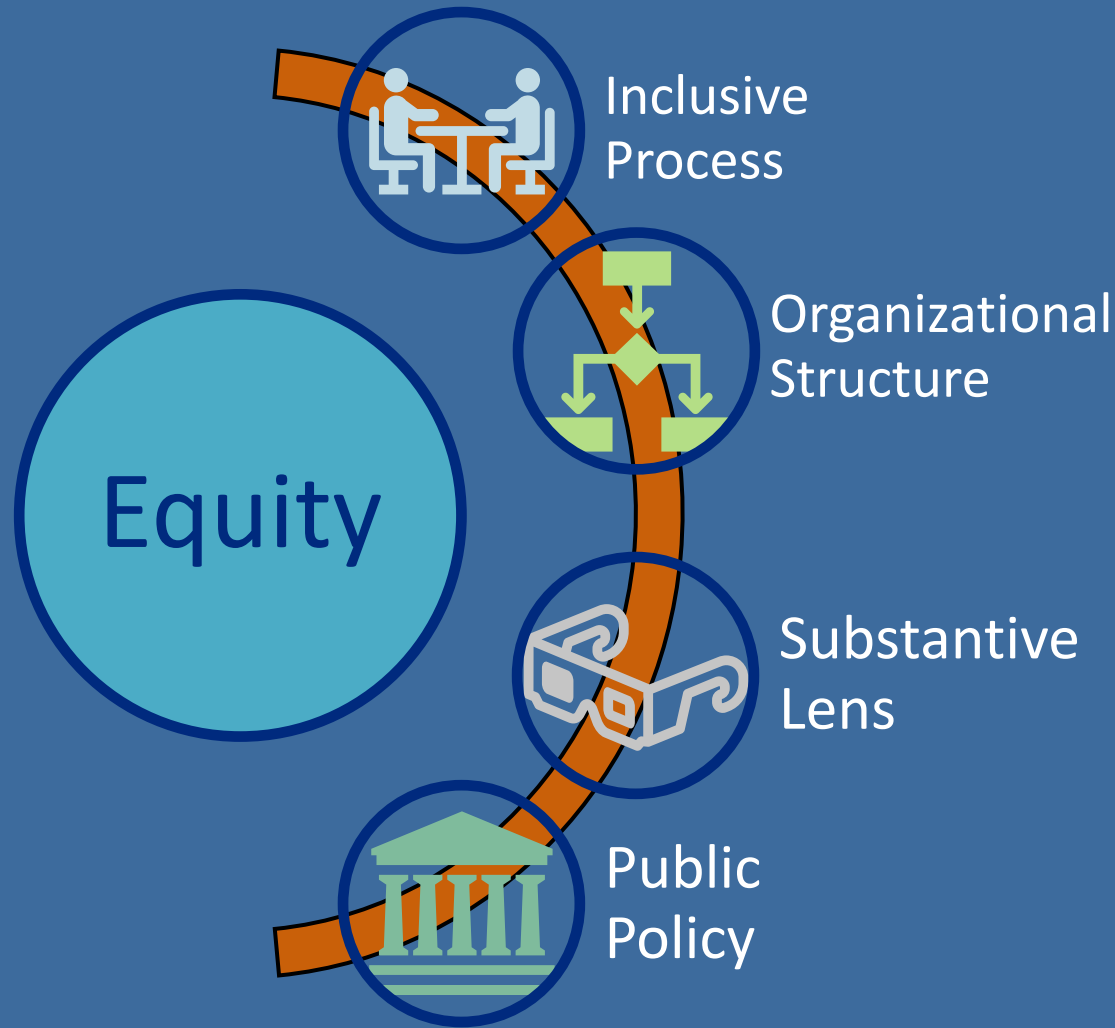
Decision expected to transform electric sector in the state

(New Britain, CT – October 3, 2019) – In a decision expected to have far-reaching implications for the state's electric sector and green economy, the Public Utilities Regulatory Authority (PURA or the Authority) voted yesterday to approve its plan to modernize the electric grid. The unanimous [decision](#) outlined PURA's vision for the next several years, including a framework for achieving an Equitable Modern Grid to benefit all Connecticut ratepayers. Next steps on the eleven near-term pathways identified by the decision begin this month, with all investigations targeted to realize four main objectives.



Connecticut Public Utilities Regulatory Authority

New Approach to “Grid Mod”



Objectives of the Framework



Framework Topics (17-12-03 “REOs”)



Energy Affordability



Advanced Metering Infrastructure



Electric Storage



Zero Emissions Vehicles



Innovation Pilots



Interconnection Standards



Framework Topics (17-12-03 “REOs”)



Non-Wires Alternatives



Resilience & Reliability Standards & Programs



Distributed Energy Resource Analysis & Program Review



New Rate Designs



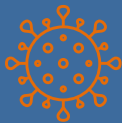
Related Topics



New Tariff Programs



Arrearage Forgiveness / Financial Assistance Programs



COVID Response



Emergency Planning + Response



Statewide Electric Storage Program



Electric Storage

Final Decision Issued July 28, 2021

- Established 9-year program beginning January 1, 2022
- Program targets support deployment of at least 580 MW
 - Supports State's goal to reach 1,000 MW by the end of 2030 – PA 21-53
- Storage systems will be compensated through two mechanisms:
 1. An upfront incentive administered by the CGB; and
 2. Performance-based incentives administered by the EDCs
- Upfront incentive cap - \$7,500 for residential; 50% installed cost C+I
- Program designed to deploy systems to maximize resilience benefits
 - Systems deployed on grid-edge, at critical facilities, replacing old genset, and for small businesses receive additional revenue stream from capacity rights
- Target to deploy 40% in LMI communities; LMI incentive adder
- Cost-benefit positive; targeted marketing campaign authorized



Statewide EV Charging Program



Zero Emissions Vehicles

Final Decision Issued July 14, 2021

- Established 9-year program beginning January 1, 2022
- Program targets support 50% of the EVSE to meet the State goals
 - CT's ZEV MOU targets 125,000 – 150,000 EVs by 2025
 - Governor's Council on Climate Change analysis targets 500,000 EVs by 2030
- Electric Vehicle Supply Equipment (EVSE) Deployment Targets for:
 - Residential Single-Family Level 2 Charging
 - Residential Multi-Unit Dwelling (MUD) Level 2 Charging
 - Direct Current Fast Charging (DCFC)
 - Destination Level 2 Charging
 - Workplace & Light-Duty Fleet Charging
- Managed Charging and Rate Design Components
- Low- to Moderate-Income (LMI) Customer Electrified Mobility Study



Additional Progress

- **Arrearage Forgiveness Programs (21-07-01)**
 - [Decision](#) approved 2021-2022 program, incorporated RE01 Sprint findings/outcomes + COVID learnings
- **AMI (17-12-03RE02)**
 - Issued [Straw Proposal](#) on August 17, 2021; Received revised plans from EDCs by November 8, 2021
 - [Requested stakeholder comment](#) on cost recovery, customer benefits, etc. by November 16, 2021



Additional Progress

- **Innovation Pilot Framework (17-12-03RE05)**
 - Would create innovation ecosystem / Innovation Council; support green economy + future solutions
 - [Issued Final Straw](#) on July 23, 2021
 - Received stakeholder comments + EDC plans
 - [Final stakeholder workshop](#) October 25, 2021
- **Interconnection Standards (17-12-03RE06)**
 - [Decision](#) stood up a Technical + Policy working groups
 - First motion from working groups ([#14](#))



Additional Progress

- **Non-Wires Alternatives (17-12-03RE07)**
 - Issued [Straw Proposal](#) on July 30, 2021; received stakeholder comments on September 21, 2021
 - Held Technical Meeting on both on October 5, 2021
- **Reliability + Resilience (17-12-03RE08)**
 - Interrelated with both EDC emergency preparedness and vegetation management; key stakeholder interest
 - [December 21, 2021 Technical Meeting](#) on utilities changes to emergency response plans based on lessons learned from TS Isaias



Additional Progress

- **Building Blocks of Resource Adequacy (17-12-03RE10)**
 - Initiated recently; [Notice of Proceeding](#) issued November 18, 2021
- **New Rate Designs (17-12-03RE11)**
 - [NEW small business rate](#) effective November 1, 2021
 - Investigation into low-income discount and economic development rates to start in 2022



More to Come

- **Performance-Based Regulation**
 - [Docket No. 21-05-15](#)
 - Authorized pursuant to [Public Act 20-5](#)
 - PURA envisions a multi-year; multifaceted stakeholder process
- **Why it matters**
 - Ensures that the utilities' incentives are aligned with the public interest, including public policy goals and improved outcomes for ratepayers



Questions?

Contact:

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Taren O'Connor
Director of Legislation, Regulations,
and Communications
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Connecticut Public Utilities Regulatory Authority



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Agenda Item #9

Plans for the 2022 Legislative Session



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Agenda Item #10

Other Business

Status of Financing Programs by Segment

Areas of Collaboration

- **Residential Single Family** – require HES and HES-IE for renewable energy tariff and battery storage incentive programs, launching Energy Storage Solutions, Smart-E Loan (including special offers for RH&C, EV, and battery storage), and Green Bank Capital Solutions
- **Residential Multifamily** – launching Energy Storage Solutions (i.e., Affordable Housing), focusing on Green Bank Solar PPA and Battery Storage, LIME Loan, C-PACE, and Green Bank Capital Solutions
- **Small Business** – extend and expand SBEA Eversource and Green Bank partnership
- **Medium to Large Business**– C-PACE, and full integration of Eversource and Green Bank financing partnership into BEA program
- **Institutional** – expanded SBEA to 7 years and up to \$1 MM for municipal and state projects, helping State of Connecticut with its “Lead by Example” implementation, and Solar MAP (in partnership with Sustainable CT) for Green Bank Solar PPA and Battery Storage. Expand access to capital for municipal and state customers through SBEA.



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Agenda Item #11

Adjourn



Draft MINUTES

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

Wednesday, June 16, 2021
1:30 - 3:00 p.m.

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

In Attendance

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

Non-Voting Members: Bryan Garcia, Bert Hunter

Members Absent:, Stephen Bruno, Donna Wells

Others: Lindsay Alfano, Sherri Burrelli, Eliza Cash, Kate Donatelli, Mackey Dykes, Richard Faesy, Brian Farnen, Kyle Huston from The Energy Group, Philip Jordan and Sarah Lehmann from BW Research, Joel Kopylec, Rebecca Meyer, Ghani Ramdani, Glenn Reed, Lawrence Rush, Cheryl Samuels, Ariel Schneider, John Wright, Nicholas Zuba, Litzy ____ (no last name given)

Unnamed Callers:

1. Call to Order

Eric Brown called the meeting to order at 1:34 pm.

2. Public Comments

No public comments.

3. Review and approval of Meeting Minutes from the March 17, 2021 meeting.

Resolution #1

Motion to approve the meeting minutes for March 17, 2021.

Upon a motion made by John Harrity and seconded by Lonnie Reed, the Joint Committee voted to approve Resolution 1. None opposed, but Brenda Watson, John Viglione, and John Watson abstains. Motion approved.

4. Clean Energy Jobs Report – Update

- Bryan Garcia introduced Philip Jordan and Sarah Lehmann from BW Research. Philip Jordan gave an overview to the previous report and Sarah Lehmann summarized the 2021 Clean Energy Report findings which includes optimism by employers with a projected 8% growth in 2021 despite a 6% decline in 2020. Connecticut’s clean energy also industry fared better than the national level in 2020.
 - Eric Brown asked if the definition of clean energy was the same for all sectors being compared, and Sarah Lehmann responded they did not, though Philip Jordan clarified that the subsectors that varied would be very small in the total, resulting in less than 1% variance.
- Sarah Lehmann summarized the COVID-19 recovery from the second half of 2020 until Q1 2021, which has been steadily rebounding. The final report is due June 25, 2021. Bryan Garcia noted the positive effects that the report is having, and that BW Research was granted money from the federal government to continue their efforts.

5. Update on the 2021 Legislative Session

- John Harrity summarized bill SB 999 for Just Transition and Community Investment and explained that projects over 2 megawatts would come under existing prevailing wages statutes, that the developer would need to enter into a Community Benefits agreement which would include a workforce development component, and then noted the overall goal is to address environmental equity, to present green energy jobs as beneficial as they are, and to reduce the negative perceptions about them.
 - Philip Jordan asked if the bill requiring prevailing wages is connected to the federal David-Bacon Acts on prevailing wages, and secondly does the bill include supply chain companies. John Harrity answered that SB 999 does not include manufacturing. As for the prevailing wages, John Harrity said that Connecticut has its own formula but does not believe they are too different from the federal ones.
- Brian Farnen summarized each of the other bills in the current legislative session, which includes PA 21-48 on Energy Efficiency Retrofit Grant Program for Affordable Housing, PA 21-53 on Energy Storage, SB 856 on the Energy Conservation Management Board, and HB 6441 on Environmental Infrastructure. He mentioned other bills being presented that are less directly related but still relevant. Bryan Garcia expanded on several bills and commented that there is more being presented this session in relation to green energy matters than is usual in previous years, which is exciting for progress for green energy.

6. C&LM Plan and Green Bank Comprehensive Plan

a. FY 2022 Connecticut Green Bank Comprehensive Plan

- Bryan Garcia reviewed the progress of the Green Bank’s Comprehensive Plan as well as the timeline for the rest of the calendar year. He went over the key points of the Plan, including the FY 2022 targets, program alignment with new legislation, inclusion of new impact reporting methodologies for equity, and addition of a glossary of acronyms. He noted the direction of the Green Bank’s Marketing plan will also be changing from a product-focused approach to a brand-focused approach.

- Richard Faesy asked if the energy storage batteries being financed are connected to the grid and enrolled with the utility companies' demand-response programs. Bryan Garcia answered that the details are to be determined, but PURA has been running a docket for the Behind the Meter programs for residential and non-residential. The program is currently planned to offer an upfront incentive through the Green Bank and then a production-based incentive would be issued through the utility companies. He suggests checking with the EDCs for more information, however.
- Eric Brown appalled the change in marketing strategy and looks forward to seeing the growth that comes from it.

b. CY 2022 Conservation and Loan Management Plan

- Glenn Reed summarized the C&LM Plan progress and timeline as well as the focus areas for the 2022-2024 Plan which includes energy affordability, decarbonization, and equity. He reviewed the 2019-2021 Plan Priorities and the current and upcoming schedule for the 2022-2024 Plan.
- Glenn Reed explained some of the themes of the 2022-2024 Plan, including the C&I lighting changes. He continued to highlight the draft versions of the Electric Revenues tables and Natural Gas Revenues.

7. Other Business

- Eric Brown noted that this is his last meeting with the Joint Committee and that he feels both organizations can benefit from collaborating, and that he feels the growth over the years has been beneficial for all. Bryan Garcia thanked Eric Brown for his work and for pushing the cooperation between the EEB and the Green Bank.

8. Adjourn

Eric Brown adjourned the Joint Committee Meeting at 2:52 pm.

Respectfully submitted,

Eric Brown, Chairperson



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

REGULAR QUARTERLY MEETING SCHEDULE FOR 2022

The following is a list of dates and times for **regular meetings** of the Connecticut Green Bank and the Connecticut Energy Efficiency Board through 2022

- **March 16, 2022** – Wednesday from 1:30-3:30 p.m.
Location: TBD
- **June 22, 2022** – Wednesday from 1:30-3:30 p.m.
Location: TBD
- **September 14, 2022** – Wednesday from 1:30-3:30 p.m.
Location: TBD
- **December 14, 2022** – Wednesday from 1:30-3:30 p.m.
Location: TBD

Should a **special meeting** be needed to address other issues that arise, a meeting will be scheduled accordingly.

September
2021

Connecticut Clean Energy Industry Report

energize
CONNECTICUT



[bw] RESEARCH
PARTNERSHIP



A Message from the Joint Committee.....	2
Introduction	
Executive Summary.....	3-4
Key Findings	5-8
Connecticut Clean Energy Industry Overview	
Overall Clean Energy Jobs.....	9-13
Full-Time Equivalent Clean Energy Jobs	14
Detailed Clean Energy Sector Employment	
Energy Efficiency	15-16
Clean Energy Generation.....	17-18
Alternative Transportation	19
Clean Grid & Storage.....	20
Clean Fuels.....	21
Clean Energy Demographics	22
Clean Energy Value Chain Employment	
Overall Value Chain Jobs	23
Value Chain Jobs by Sector	24
Clean Energy Hiring & COVID-19 Impacts	
Hiring Difficulty	25
COVID-19 Impacts	26
Regional Clean Energy Employment	27
Appendix A: Research Methodology	28
Appendix B: Clean Energy Technology List	28

A Message from the Joint Committee

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

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

[The administration of Governor Ned Lamont](#), the Connecticut Green Bank, the Energy Efficiency Board, the utilities who administer the energy efficiency funds, and other local, state, and federal authorities worked closely with clean energy developers and contractors to lessen the impacts of the pandemic on vital clean energy industry. This report highlights the fact that Connecticut's clean energy economy was more resilient than other states in the region and the nation overall. Total clean energy employment in Connecticut declined by only six percent in 2020 to 41,488 jobs; compared to a nationwide

energy employment decrease of nine percent and neighboring state declines ranging from seven to 16 percent. The resilience of the state's clean energy industry is a testament to the resolve of the firms, workers, policymakers and others who provide leadership and support.

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

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

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

2021 Connecticut Clean Energy Industry Report

This report is the second annual report tracking clean energy employment in Connecticut. The 2020 Connecticut Clean Energy Industry Report¹ provided an important baseline from which to measure clean energy activity in Connecticut's labor market. This year's report follows in the aftermath of the global Coronavirus (COVID-19) pandemic and provides detail on how the pandemic-induced economic recession affected clean energy jobs across the state. The Joint Committee commissioned BW Research Partnership to produce this 2021 report, with financial support provided by the Connecticut Green Bank, Eversource, and AVANGRID, Inc., subsidiaries UI, SCG and CNG.

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

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

¹ <https://ctgreenbank.com/wp-content/uploads/2020/11/2020-Connecticut-Clean-Energy-Industry-Report.pdf>

² For more information on what constitutes a clean energy job and which clean energy technologies are included in this report, please refer to Appendix B: Clean Energy Technology List.

³ <https://www.usenergyjobs.org/>

About Energize CT and Joint Committee

Energize CT

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

Joint Committee

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

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

About the Members

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



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



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



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



Clean energy employment declines in Connecticut were lower

compared to the overall statewide economy, the national clean energy labor market, and other clean energy economies in the Northeast.

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

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

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



Clean Energy Labor Market & Economic Activity

Total clean energy employment declined by six percent in 2020.

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

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

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



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

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

Clean Energy Labor Market & Economic Activity

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

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

Solar jobs declined by 6.8 percent in 2020.

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

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

The alternative transportation sector grew in 2020.

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

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

The number of FTE clean energy jobs⁵ declined by 10.3 percent in 2020, a reduction of just over 3,200 workers that spend all of their labor hours on clean energy-related activities. Compared to 2015, full-time equivalent clean energy jobs were still two percent higher than the baseline.

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

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



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

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

Clean Energy Demographics

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

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



Clean Energy Hiring & Covid-19 Impacts

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

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

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

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

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

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

Overall Clean Energy Jobs

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

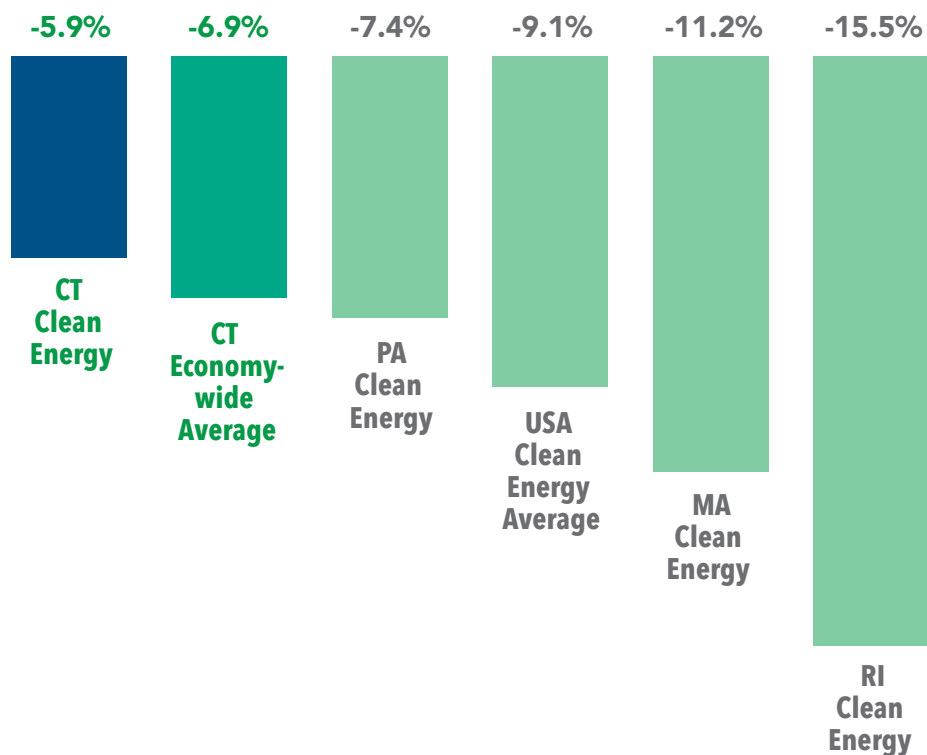
The COVID-19 pandemic wiped out nearly four years of clean energy employment growth across the state, sending Connecticut's clean energy labor market back to 2016 employment levels. By comparison, using the latest available data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages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

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



Employment Change Comparisons, 2019-2020

Figure 1



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

Overall Clean Energy Jobs

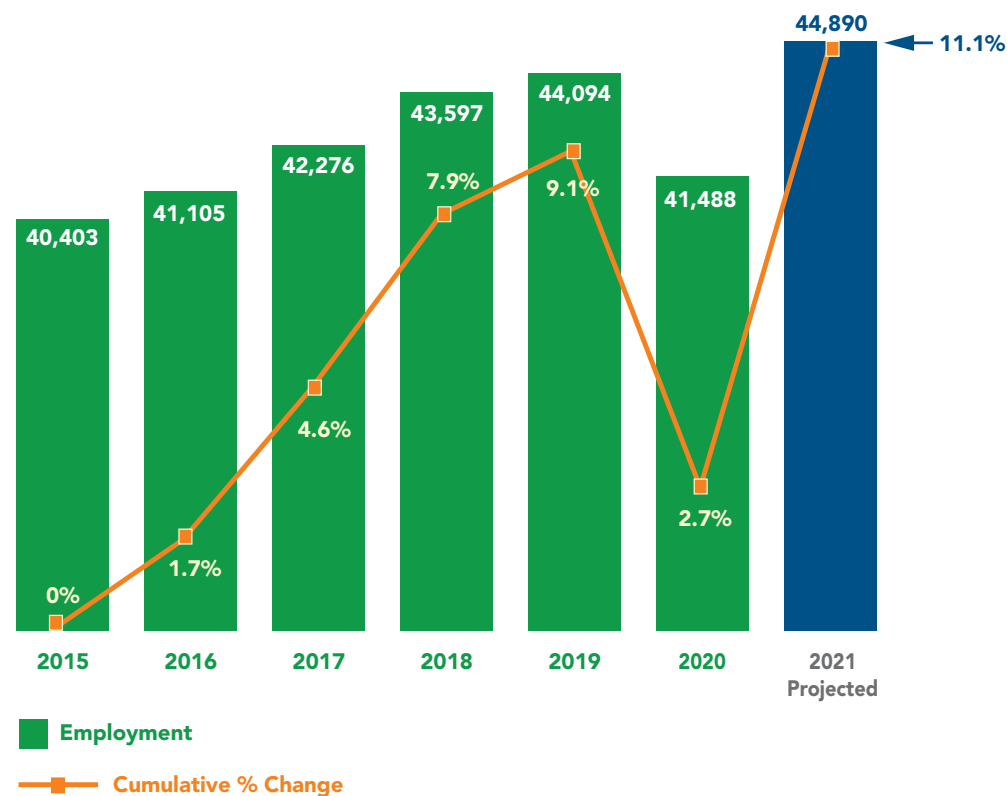
Despite employment losses throughout 2020, clean energy employers in the state are optimistic about job growth over 2021. Connecticut's clean energy industry projected an 8.2 percent employment growth in 2021—estimating the addition of roughly 3,400 clean energy jobs.

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

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

Clean Energy Employment In Connecticut
2015-2021 Projected

Figure 2



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

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

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

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

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

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

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

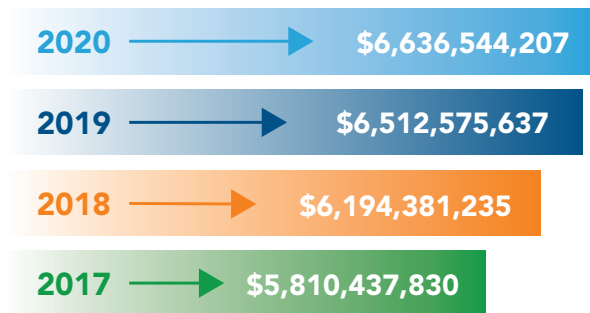
Overall Clean Energy Jobs

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

This represents a 14.2 percent increase since 2017 and a roughly two percent increase between 2019 and 2020.⁸ Clean energy professional and business services accounted for roughly a third of total GRP contributions, followed by manufacturing at 27 percent and utilities at 21 percent.

Clean Energy Gross Regional Product (GRP) 2017-2020

Figure 3



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

Table 1

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

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

Overall Clean Energy Jobs

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

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

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

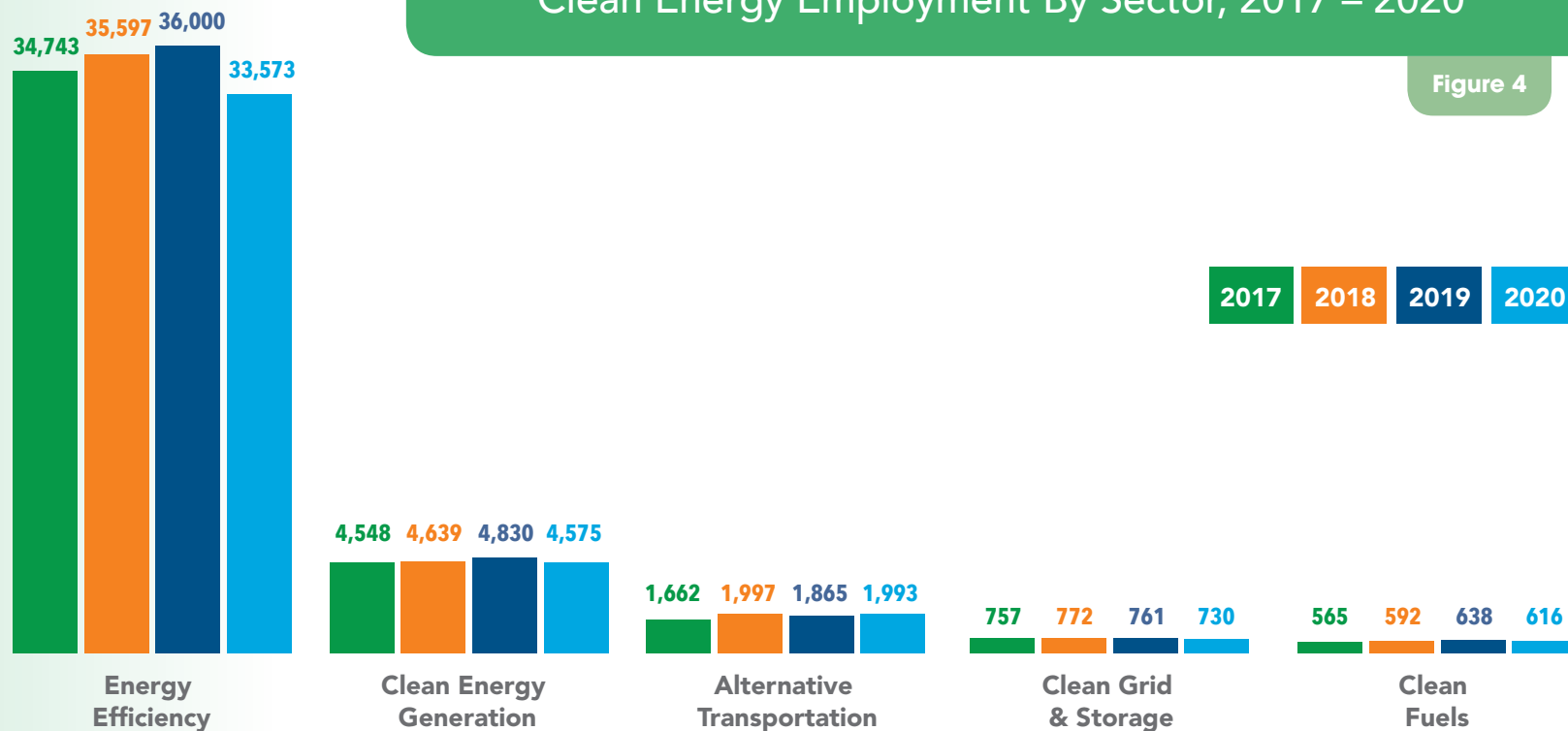


Figure 4



Clean Energy Employment By Sector, 2017 – 2020

Overall Clean Energy Jobs

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

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



Clean Energy Establishments by Sector, 2017-2020

Table 2

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

Full-Time Equivalent Clean Energy Jobs

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

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

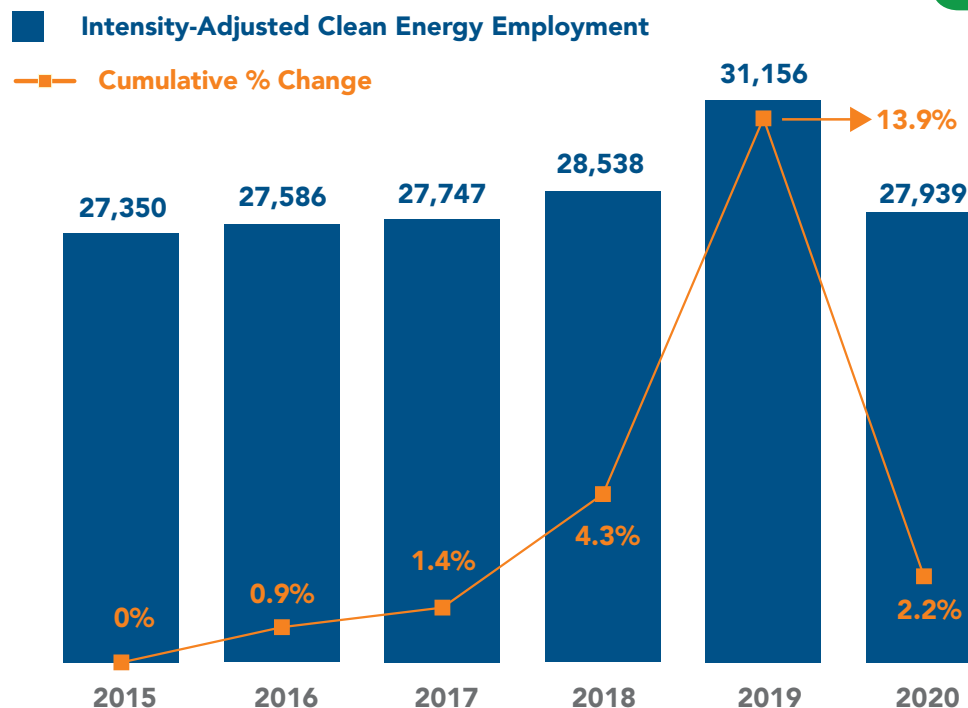
As of the last quarter of 2020 there were 27,939 FTE clean energy jobs in Connecticut—a decline of 10.3 percent in 12 months, or about 3,200 fewer FTE clean energy workers. Compared to the baseline in 2015, FTE clean energy jobs were still about two percent higher.

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

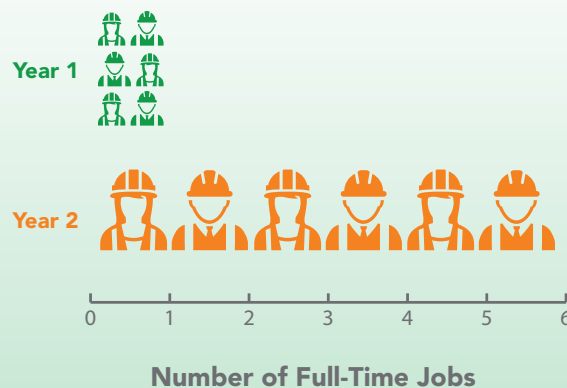
¹⁰ These jobs were extrapolated using a combination of state-level and census region data. The data was adjusted based on revenue distribution by technology and weighted according to how much time workers were reported to spend on clean energy activities (0-49 percent, 50-99 percent, or 100 percent).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

Full-Time Equivalent Clean Energy Jobs, 2015-2020¹⁰

Figure 5



FTE Clean Energy Jobs Explained



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

Energy Efficiency

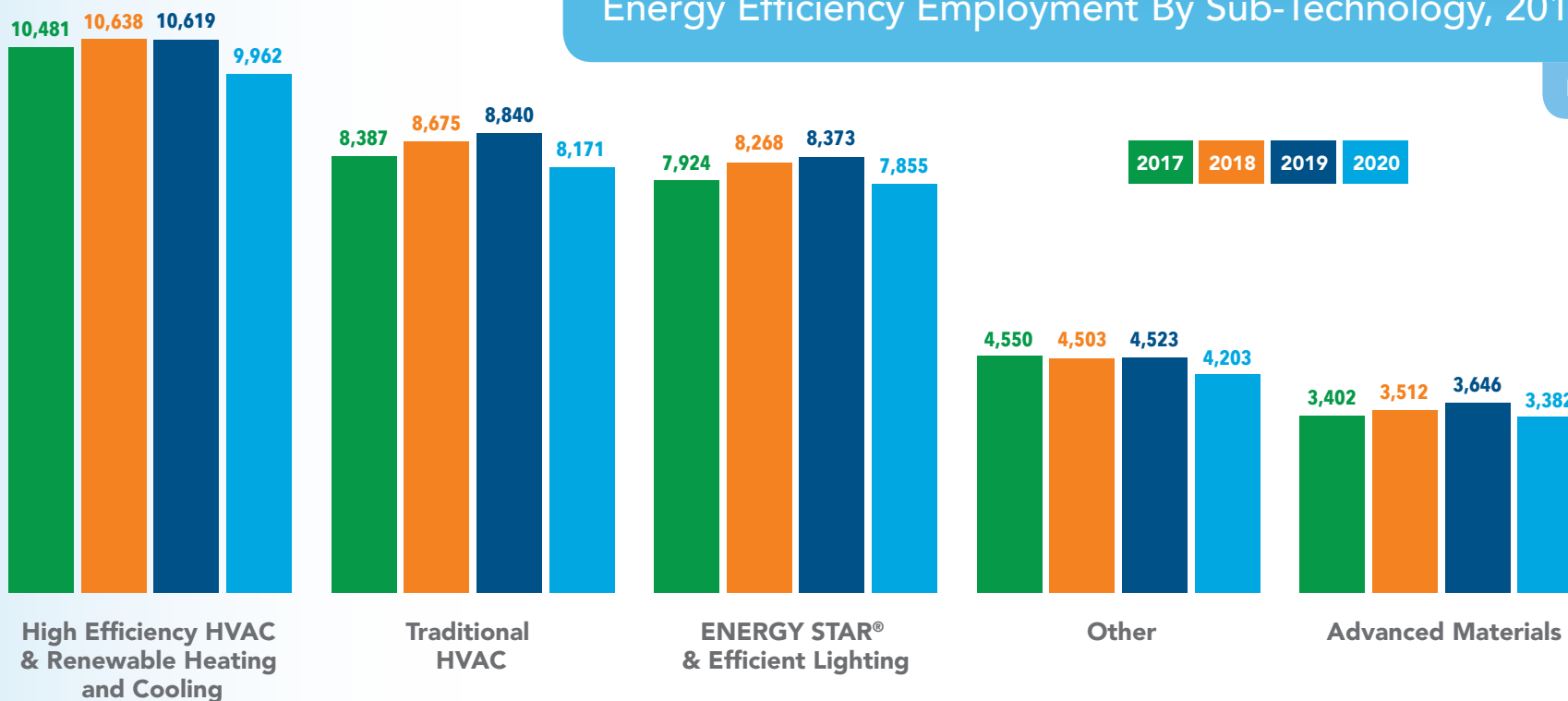
All energy efficiency sub-technologies saw employment declines in 2020.

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



Energy Efficiency Employment By Sub-Technology, 2017-2020¹¹

Figure 6



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

Energy Efficiency

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

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

Challenge

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

Solution

While the search for a location took longer than anticipated, when the team toured 25 Industrial Park Place in July 2018 it moved ahead with focus and



MARC Community Resources • Middletown, CT

determination. MARC closed on the property in July 2019 after an OPM grant of \$487,500 was secured and People's Bank committed to a construction loan. The build-out designs were specified, revised and revised again. Intending to complete the renovation and build-out by Spring 2020, the team began to prepare for the transition to their new space.

Results

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

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

*Linda C. Iovanna,
Former President and
CEO of MARC*

Clean Energy Generation

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

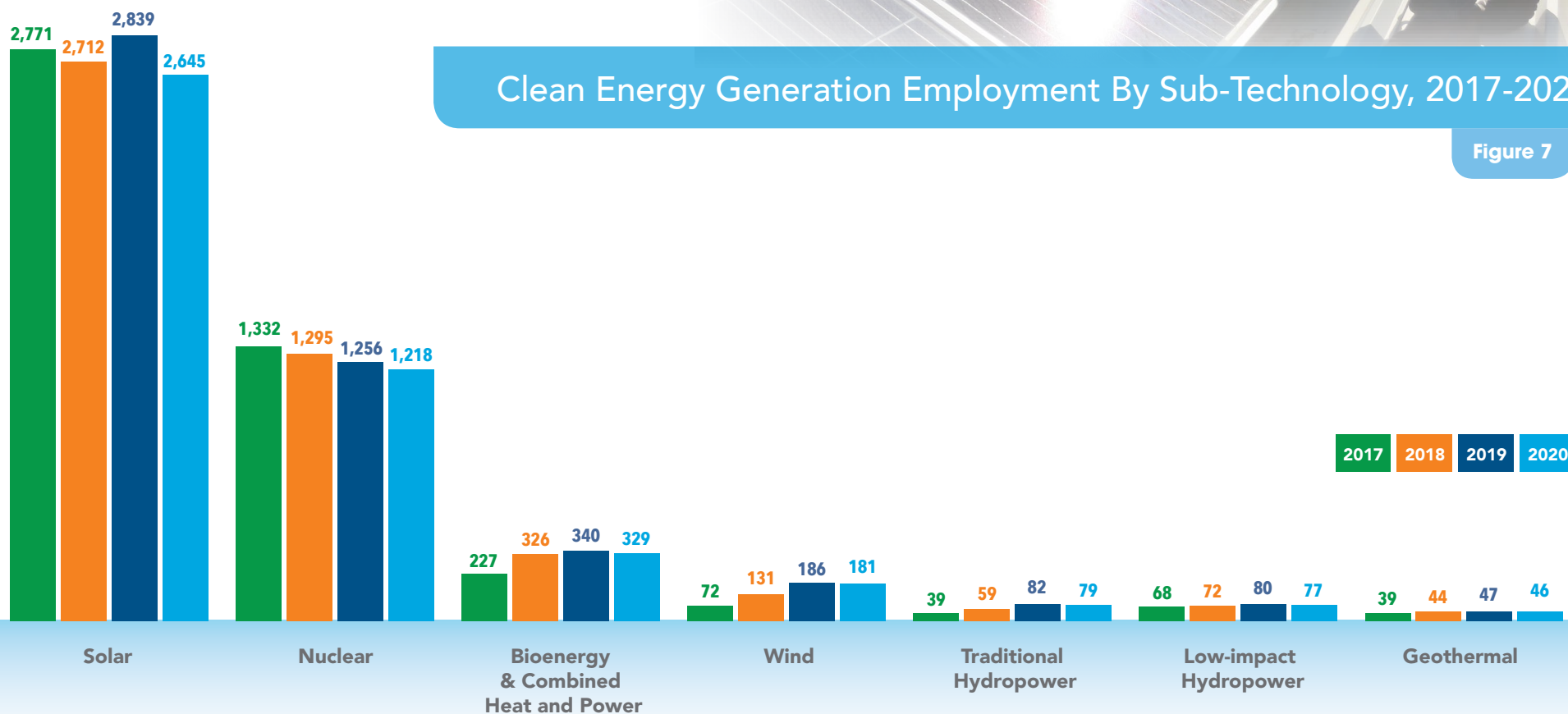
Between 2019 and 2020, solar employment declined by almost 200 jobs (-6.8 percent). Compared to the 2011 baseline, solar employment remains 113 higher.

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



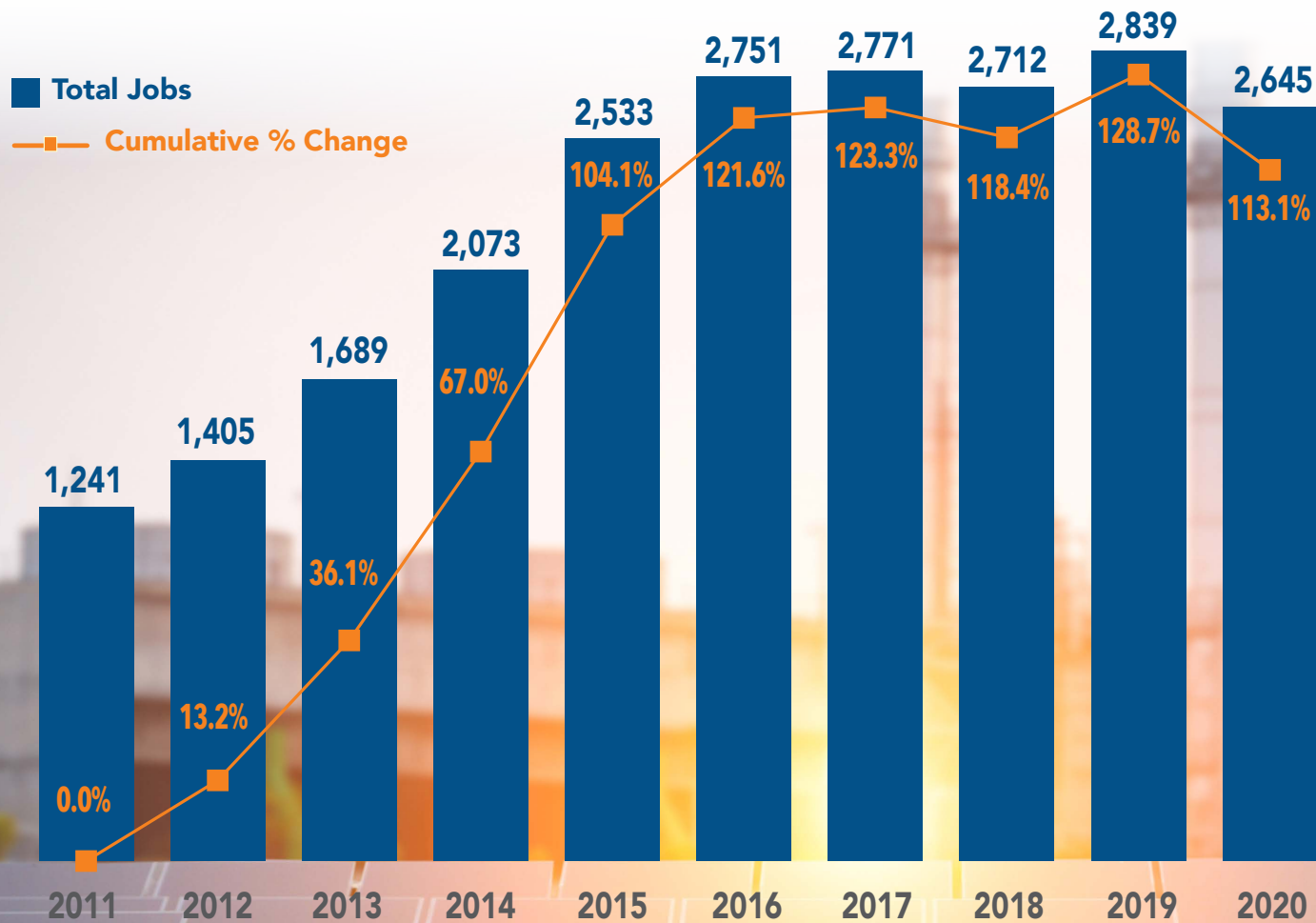
Clean Energy Generation Employment By Sub-Technology, 2017-2020

Figure 7



Solar Employment, 2011-2020

Figure 8



Alternative Transportation

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

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



Alternative Transportation Employment
By Sub-Technology, 2017-2020

Figure 9

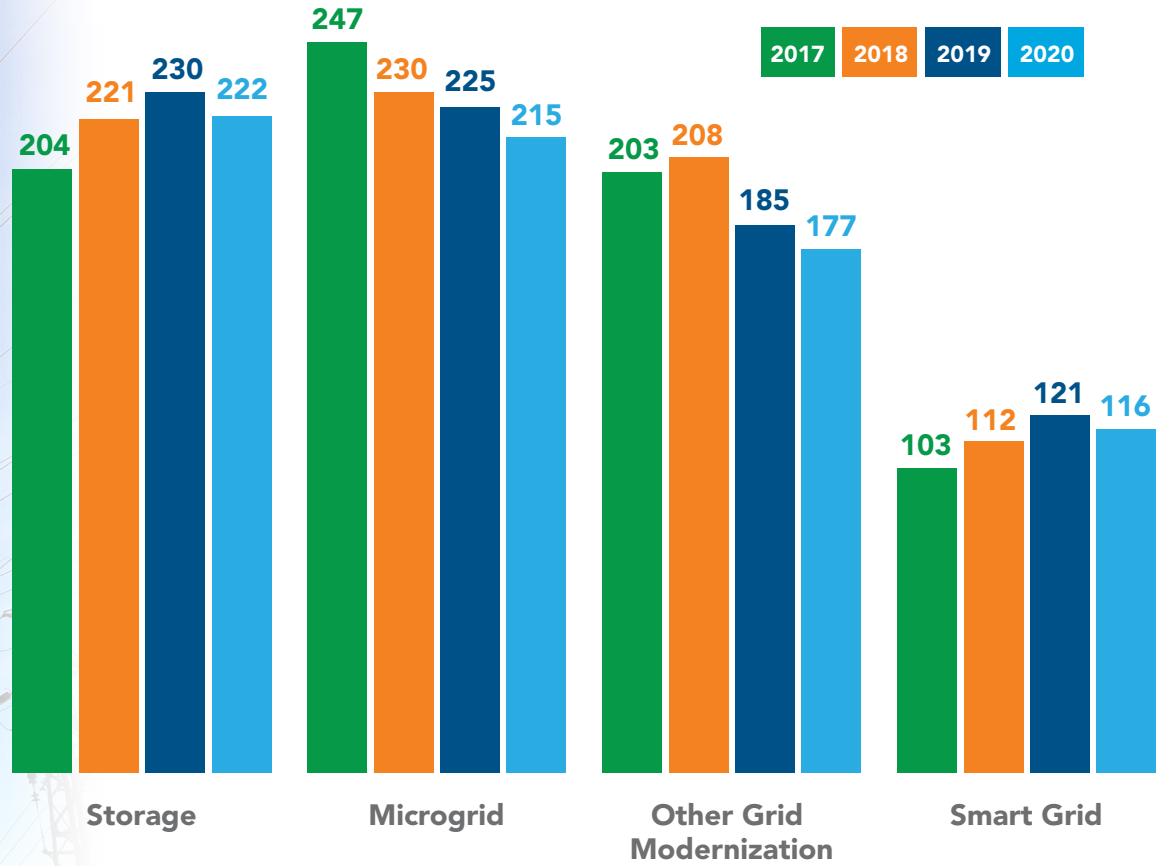
Clean Grid & Storage

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

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

Clean Grid And Storage Employment By Sub-Technology, 2017-2020¹²

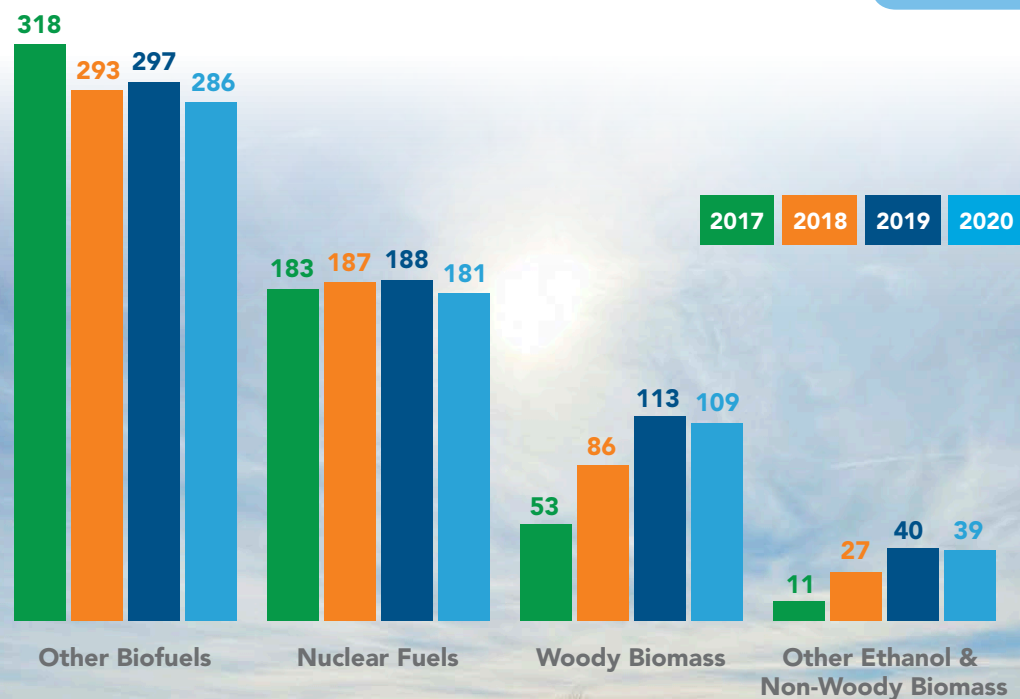
Figure 10



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

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

Figure 11



First Biogas Dairy Digester in Connecticut

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

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

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

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



Clean Energy Workforce Demographics, 2020¹⁴

Table 3

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

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

Overall Value Chain Jobs

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

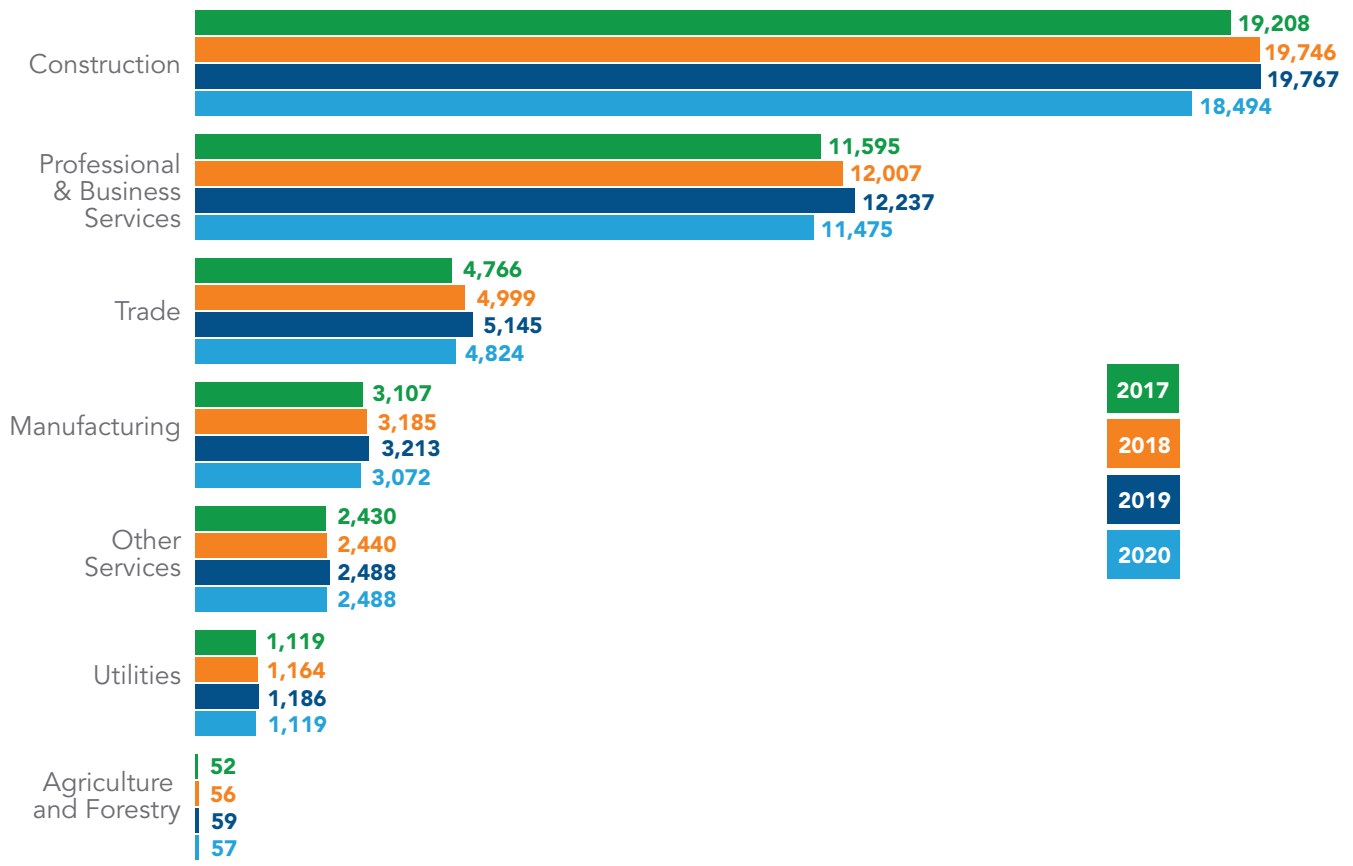
Overall, clean energy construction firms shed almost 1,300 workers, for a decline of 6.4 percent between the last quarters of 2019 and 2020. Professional and business services, which includes consulting, finance, legal, or research support declined by 6.2 percent (-762 jobs), followed by wholesale trade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

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



Clean Energy Employment By Value Chain Segment, 2017-2020

Figure 12



Value Chain Jobs by Sector

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

For the clean grid and storage (63 percent) and energy efficiency (50 percent) sectors, construction activity accounts for half or more of total jobs. Within the alternative transportation sector, all value chain segments experienced

growth in 2020, with the majority of job growth concentrated in manufacturing, wholesale trade, and other services, which is largely comprised of automotive repair and maintenance.

Value Chain Employment by Clean Energy Sector, 2020

Table 5

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

Value Chain Proportional Employment By Clean Energy Sector, 2020

Table 6

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

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

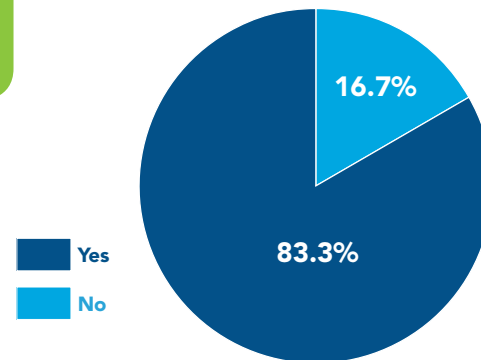
Hiring Difficulty

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

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

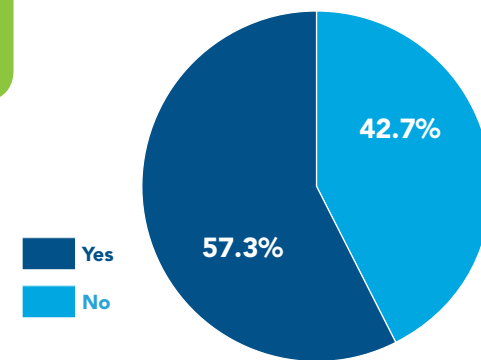
Adequate Workers To Meet Current Needs, 2020

Figure 13



Actively Hiring For New Positions or Vacancies, 2020

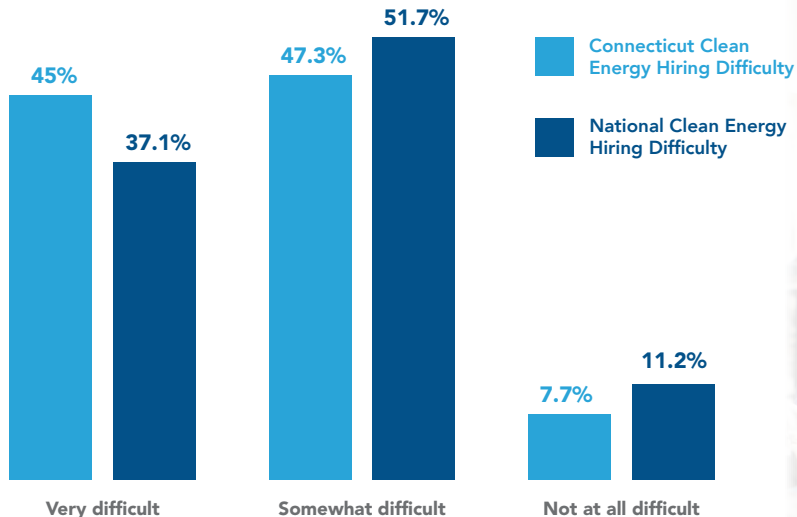
Figure 14



Employer-Reported Hiring Difficulty, 2020

Figure 15

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



COVID-19 Impacts

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

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

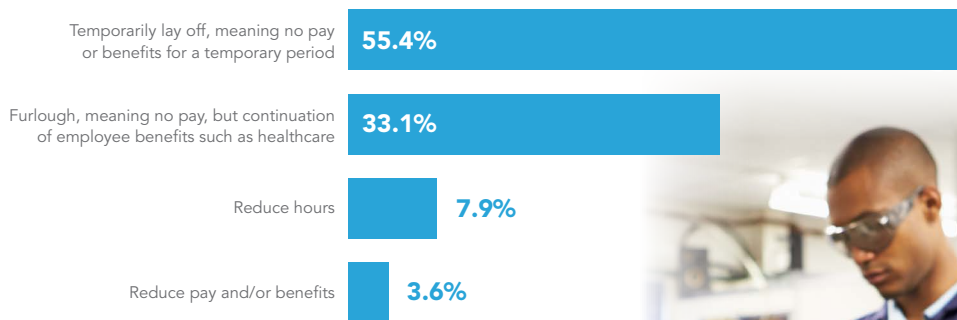
Covid-19 Workforce Impacts, 2020

Figure 16



Covid-19 Workforce Impacts, 2020

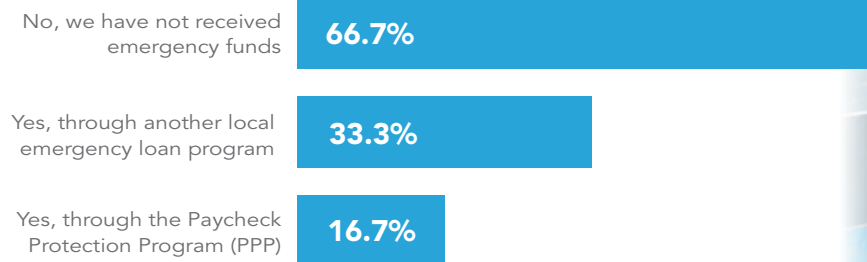
Figure 17



COVID-19 Relief Programs & Assistance, 2020¹⁶

Figure 18

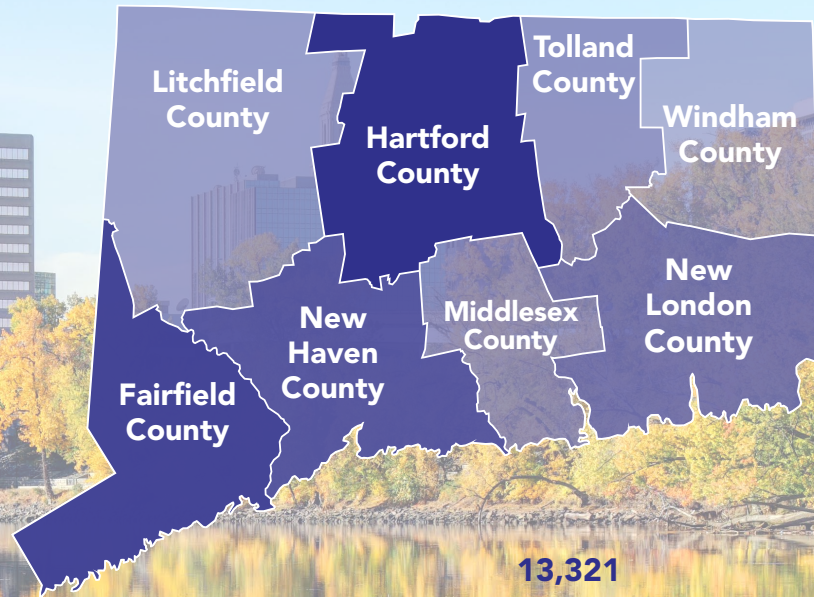
Two-thirds of Connecticut's surveyed clean energy firms reported that they did not receive emergency funds in 2020. A third of clean energy firms reported that they received assistance through a local emergency loan program, and 17 percent of clean energy firms reported that they received support through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



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

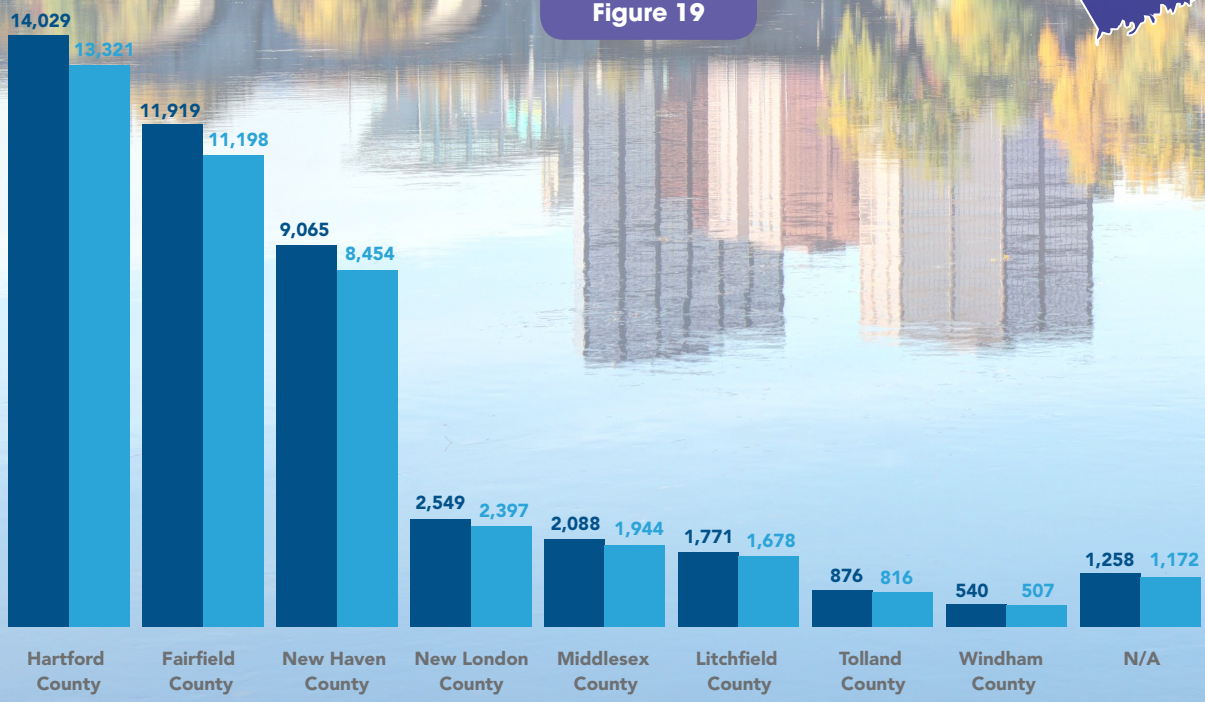
Figure 20

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



Clean Energy Employment By County, 2019-2020¹⁷

Figure 19



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

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

In total, 597 business establishments in Connecticut participated in the survey effort. These responses were used to develop incidence rates among industries as well as to apportion employment across various industry categories in ways currently not provided by state and federal labor market information agencies. The margin of error for incidence is +/- 3.99 percent for Connecticut at a 95 percent confidence interval. The full research methodology for USEER may be found at: <https://www.usenergyjobs.org/>

Appendix B: Clean Energy Technology List

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

The major clean energy sectors are as follows:

1. Energy Efficiency
2. Clean Energy Generation
3. Alternative Transportation
4. Clean Grid & Storage
5. Clean Fuels

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

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

CLEAN ENERGY GENERATION

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

CLEAN GRID & STORAGE

Electric Power Transmission and Distribution

- Smart Grid
- Microgrids
- Other Grid Modernization

Storage

- Pumped Hydropower Storage
- Battery Storage, including battery storage for solar generation
 - Lithium Batteries
 - Lead-Based Batteries
 - Other Solid-Electrode Batteries
 - Vanadium Redox Flow Batteries
 - Other Flow Batteries

- Mechanical Storage, including flywheels, compressed air energy storage, etc.
- Thermal Storage
- Biofuels, including ethanol and biodiesel
- Nuclear Fuel

ENERGY EFFICIENCY

- ENERGY STAR Certified Appliances, excluding HVAC
- ENERGY STAR Certified Heating Ventilation and Air Conditioning (HVAC), including boilers and furnaces with an AFUE rating of 90 or greater and air and central air conditioning units of 15 SEER or greater
- Traditional HVAC goods, control systems, and services¹⁹
- ENERGY STAR Certified Electronics (TVs, Telephones, Audio/Video, etc.)
- ENERGY STAR Certified Windows and Doors
- ENERGY STAR Certified Roofing
- ENERGY STAR Certified Seal and Insulation
- ENERGY STAR Certified Commercial Food Service Equipment
- ENERGY STAR Certified Data Center Equipment
- ENERGY STAR Certified LED Lighting
- Other LED, CFL, and Efficient Lighting
- Solar Thermal Water Heating and Cooling
- Other Renewable Heating and Cooling (geothermal, biomass, heat pumps, etc.)
- Advanced Building Materials/Insulation
- Recycled Building Materials

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

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



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