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RENEWABLE ENERGY

SECTOR SNAPSHOT 2022

ADVANCECT
CONNECTICUT

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ABOUT ADVANCECT



OUR MISSION

AdvanceCT strives to build a place where business, government, higher education and nonprofits come together to implement high impact and inclusive economic development solutions to advance the overall competitiveness of Connecticut.

ECONOMIC DEVELOPMENT

AdvanceCT is a private nonprofit corporation that drives job creation and new capital investment in Connecticut through high-impact economic development including business attraction, retention, and expansion.

WHAT WE DO

AdvanceCT works in close cooperation with the Connecticut Department of Economic and Community Development (DECD), the private sector, and various state, regional, and local partners to promote Connecticut as a place to do business. Our team is dedicated to ensuring that industries expand, residents thrive, and businesses feel at home in our state.

LEARN MORE AT [ADVANCECT.ORG](https://www.advancect.org) ➤



A NATIONAL LEADER IN CLEAN ENERGY

CONNECTICUT IS POISED FOR SUCCESS

PORTS AND PHYSICAL INFRASTRUCTURE

LOCAL, REGIONAL AND GLOBAL SUPPLY CHAIN

SKILLED WORKFORCE

- Strategically located along the Northeastern coast
- A thriving, robust, and experienced supply chain operating in a 90-mile radius
- World-class education and skilled workforce
- Home to 3 deep water ports and a multitude of small harbors, rail lines, and interstate highways crisscrossing the state

Connecticut plans to power 100% of electricity from zero-carbon sources by 2040.

Connecticut is committed to deploying up to 2,000 MW of offshore wind energy, the equivalent to 30% of the state load – **enough to power 1 million homes.**

SOURCE: CT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, 2019



The **largest solar farm** in New England¹



The nation's first ever **Green Bank**²



4th best state for energy consumption per dollar of real GSP³



The **first EV charging station** company that is both **made & assembled in the U.S.**⁴



State-run Clean Energy Procurement Plan with **100% zero carbon** goal⁵



7th highest share of electricity generated from **nuclear power**⁶

SOURCE: ¹HARTFORD COURANT, 2021; ²CT GREEN BANK, 2011; ³U.S. ENERGY INFORMATION ADMINISTRATION, 2020; ⁴CISION, 2021; ⁵CT OFFICE OF THE GOVERNOR, 2022; ⁶U.S. ENERGY INFORMATION ADMINISTRATION, 2021.



OFFSHORE WIND PROJECTS IN CONNECTICUT

Revolution Wind

Powered by Ørsted & Eversource

1

704 MW

Joint venture between Ørsted & Eversource Energy, providing 304 MW to Connecticut and 400 MW to Rhode Island

\$255M public-private investment in the State Pier Terminal

The first in North America to accommodate turbine assembly, staging and maritime cargo



Park City Wind



2

804 MW

Largest purchase of renewable energy in state history³

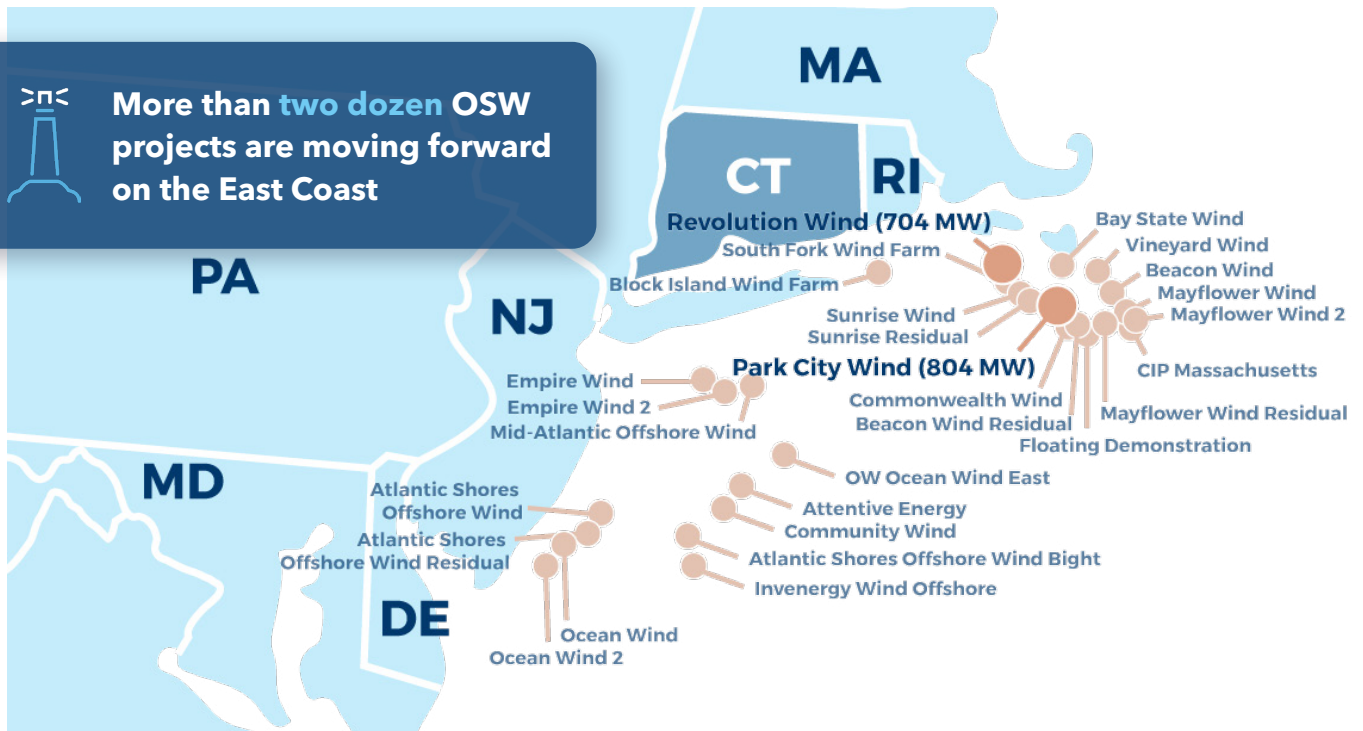
AVANGRID is redeveloping an 18.3-acre waterfront industrial site for assembly & staging

Project will generate approximately \$890M in direct economic benefits and thousands of jobs

SOURCE: ¹REVOLUTION WIND, 2022; ²PARK CITY WIND, 2022; ³CT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, 2019.



More than **two dozen** OSW projects are moving forward on the East Coast



SOURCE: LOCATIONS OF U.S. OFFSHORE WIND PIPELINE ACTIVITY AND CALL AREAS AS OF MAY 31, 2022, U.S. DEPARTMENT OF ENERGY.



Connecticut: A Manufacturing Powerhouse

Driven by leading global OEMs in high-tech industries and supported by thousands of supply chain participants, Connecticut is home to more than 200 aerospace and defense manufacturing companies that support a variety of subsectors.



- **\$23.6 Billion of defense spending in Connecticut in 2020¹**
- **#2 state for defense spending per capita¹**
- **3 of the top 10 defense vendors in 2020¹**
- **#5 state for concentration of engineers²**

Company	Industry	Revenue ('21) ³	CT Jobs ⁴
Electric Boat	Ship Building	\$10 billion	10,000
Collins Aerospace	Aerospace & Defense	\$18.4 billion	4,000
Pratt & Whitney	Aerospace & Defense	\$18.2 billion	8,300
ASML	Semiconductors	\$22 billion	1,700
Stanley Black & Decker	Tools & Accessories	\$15.6 billion	500
Amphenol	Electronic Connectors	\$10.9 billion	300
Sikorsky	Aerospace & Defense	\$5.4 billion ¹	7,000
Perkin Elmer	Diagnostics & Research	\$5.1 billion	500
OTIS Worldwide	Elevator Systems	\$3.6 billion	400
Kaman Aerospace	Aerospace & Defense	\$709 million	1,000

SOURCE: ¹U.S. DEPARTMENT OF DEFENSE, 2020; ²LIGHTCAST, 2020; ³2021 FINANCIAL DISCLOSURES: ELECTRIC BOAT; STANLEY; KAMAN; AMPHENOL; PERKINELMER; OTIS; COLLINS AND P&W; ASML; ⁴DATA AXEL, 2022.



GREEN CONNECTICUT



#1 lowest state contributor to climate change

(WALLETHUB, 2022)



#3 in the nation for total fuel cell patents

(CT DEPARTMENT OF ECONOMIC & COMMUNITY DEVELOPMENT, 2021)

#3 in the U.S. for offshore wind power

(BUSINESS FACILITIES MAGAZINE, 2022)

#8 most energy-efficient state in the nation

(AMERICAN COUNCIL FOR AN ENERGY EFFICIENT ECONOMY, 2022)

#8 greenest state in the U.S.

(WALLETHUB, 2022)

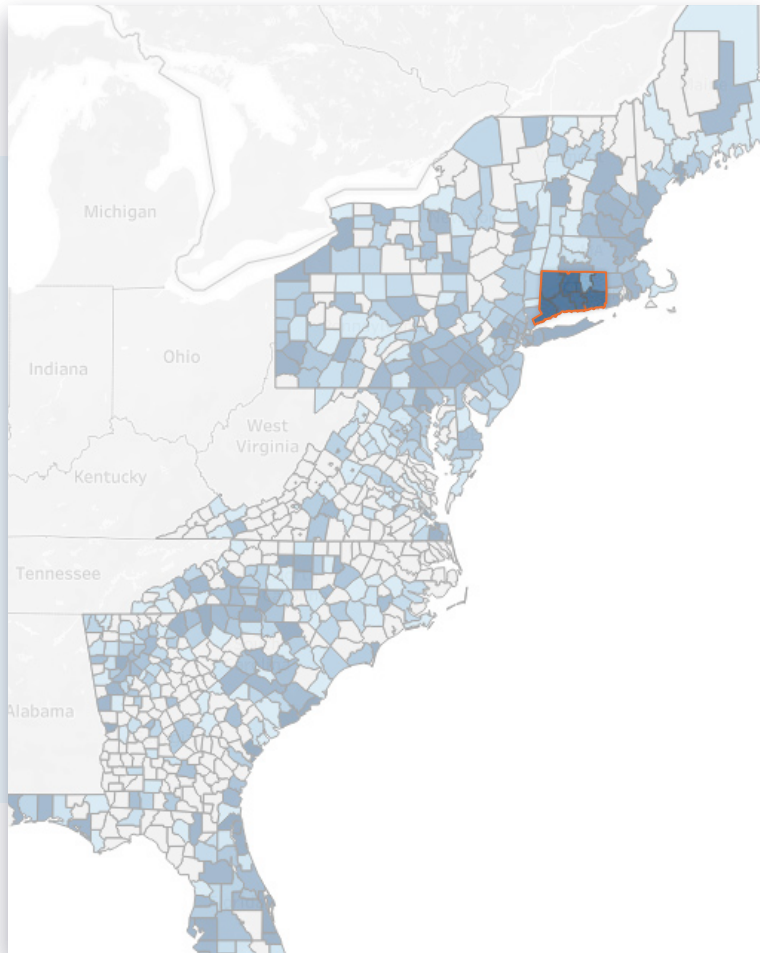


WORKFORCE

RENEWABLE ENERGY SECTOR SNAPSHOT



#1 OFFSHORE WIND SUPPLY CHAIN IN THE U.S.



48,300 Jobs
MOST ON THE EAST COAST

Highest Job Concentration
6.25 TIMES NATIONAL AVERAGE

\$11 Billion State GDP
HIGHEST ON EAST COAST & 4TH IN U.S.



#1 STATE FOR
AIRCRAFT ENGINE & ENGINE
PARTS MANUFACTURING

16,900 Jobs – **18x** the national concentration



#2 STATE FOR
SHIP BUILDING AND
REPAIRING

11,800 Jobs – **11x** the national concentration

SOURCE: LIGHTCAST, 2020; ADVANCECT CALCULATIONS. INDUSTRIES BASED ON RESEARCH FROM NAVIGANT CONSULTING, NREL, BVG ASSOCIATES, AND MCALLISTER MARINE ENGINEERING



ABUNDANT OSW TALENT



6.8X

the national concentration of
**Marine Engineers and
Naval Architects**



More than double

the national concentration of
**Aerospace Engineers,
Fiberglass Laminators &
Fabricators, Machinists, and
Tool & Die Makers**



3.2X

the national concentration of
**Mining and Geological
Engineers, Including
Mining Safety**

SOURCE: LIGHTCAST 2020; ADVANCECT CALCULATIONS

Educated Workforce



#1 state for college readiness

(U.S. NEWS & WORLD REPORT,
2021)

**#3 most educated state
workforce in the U.S.**

(WALLETHUB, 2021)

**#3 state for employees with
advanced degrees**

(U.S. CENSUS BUREAU, 2021)

**#4 on the Human Capital
Investment Composite Index**

(MILKEN INSTITUTE, STATE
TECHNOLOGY AND SCIENCE
INDEX, 2022)

#4 state for knowledge jobs

(INFORMATION TECHNOLOGY &
INNOVATION FOUNDATION, 2020)

**#7 in the U.S. for employed
science, engineering, & health
doctorates in the workforce**

(NATIONAL SCIENCE
FOUNDATION, 2019)



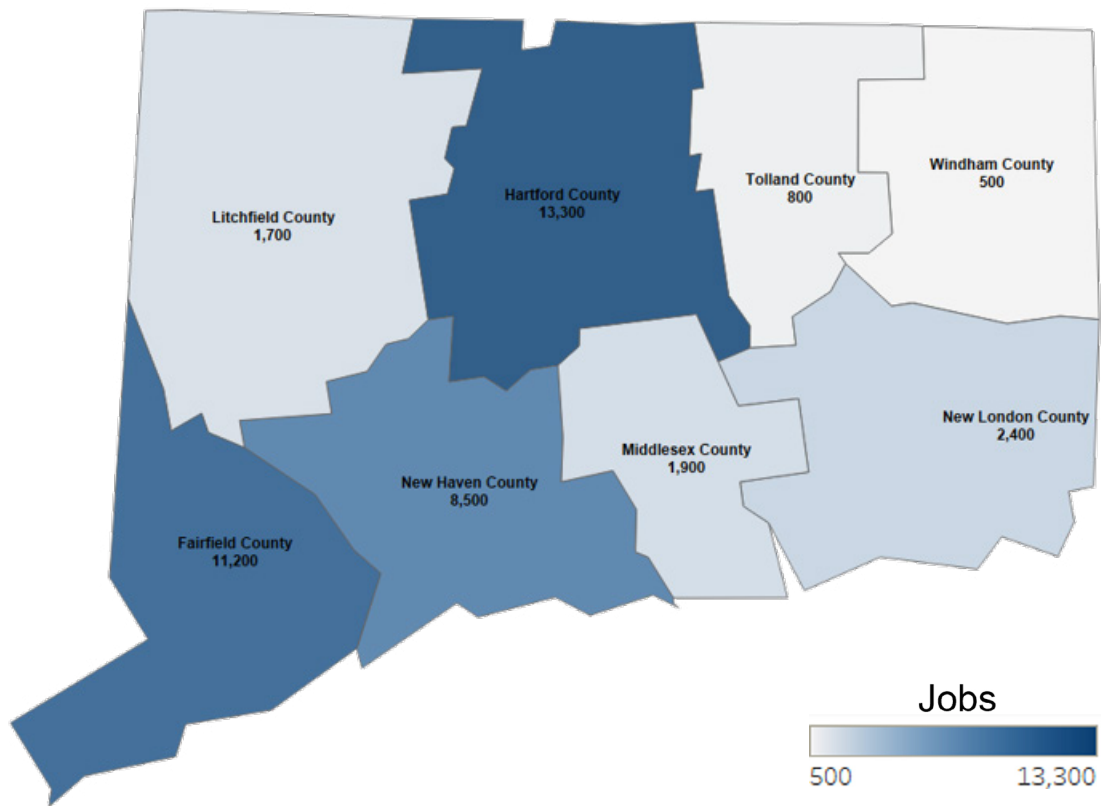
Clean jobs that directly involve Energy Efficiency, Clean Grid & Storage, or Clean Energy Generation:

Solar (PV and Thermal)
Wind Generation
Geothermal Generation
Bioenergy/Biomass/Biofuels
Hydroelectric Power

Nuclear Generation and Fuel
Combined Heat and Power
Energy Star Efficiency
Advanced Building Materials
Recycled Building Materials

Smart Grid/Microgrid
Hydropower Storage
Thermal Storage
Batteries

More than 40,000 clean energy jobs in Connecticut

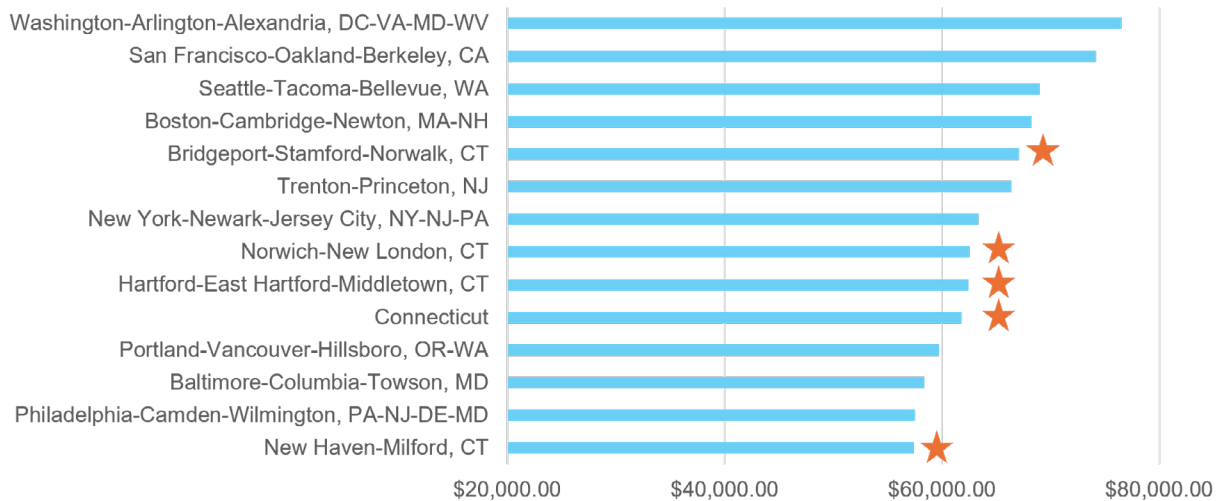


SOURCE: CT GREEN BANK, 2021 CT CLEAN ENERGY INDUSTRY REPORT ESTIMATES



CONNECTICUT IS AFFORDABLE

2020 Median Annual Earnings

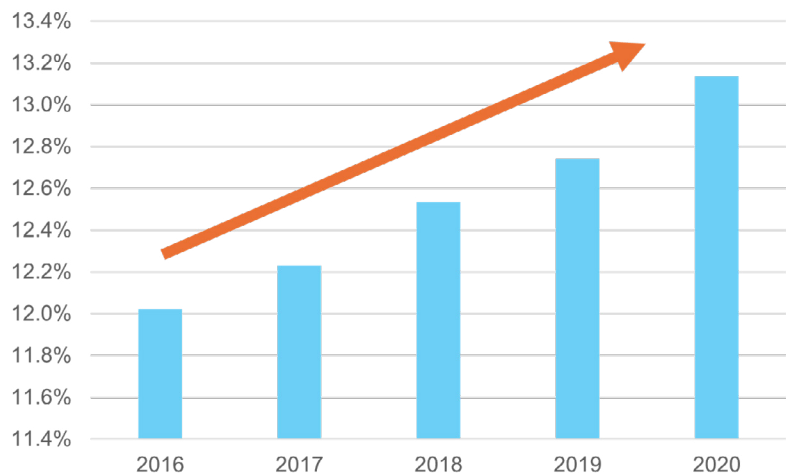


Connecticut OSW supply chain talent is **more affordable** than many other hubs.

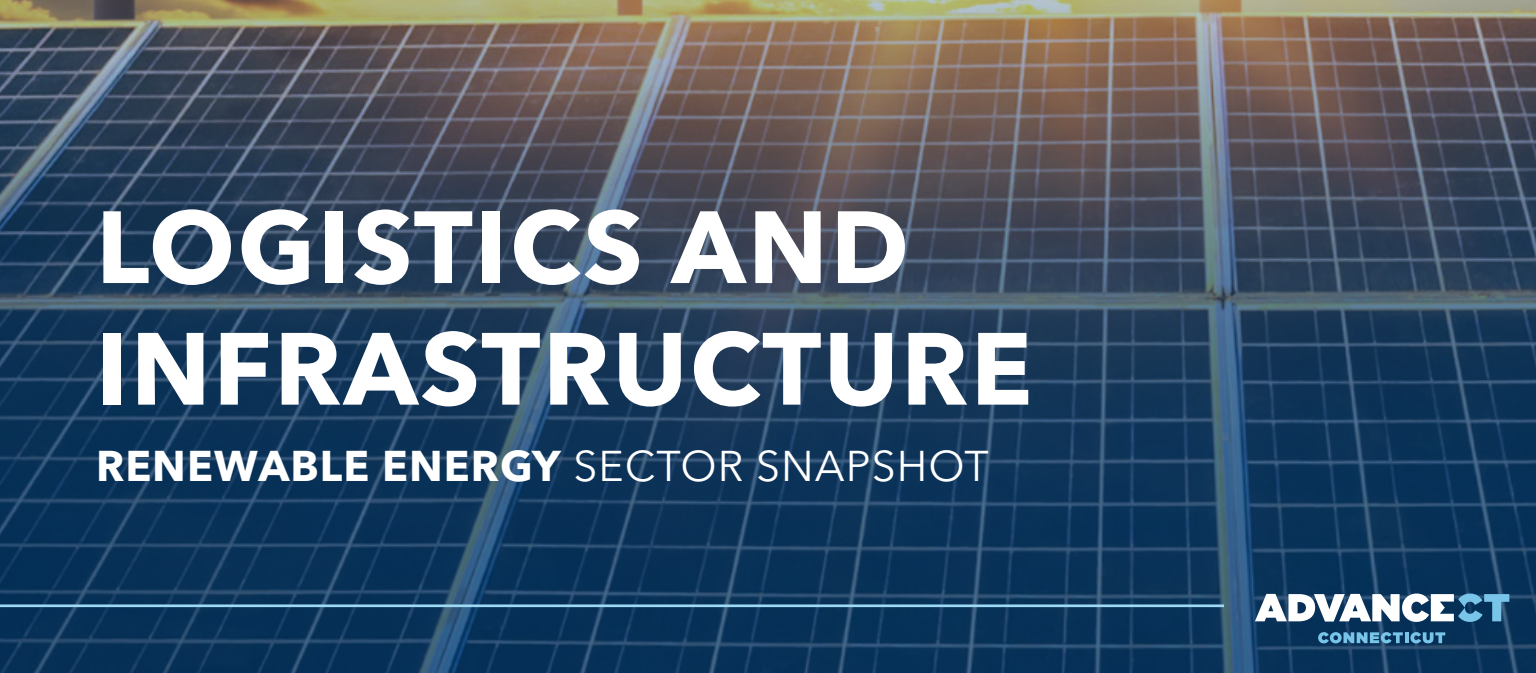
OSW Supply Chain Occupations, % of All CT Jobs



OSW supply chain talent is increasingly prominent in the Connecticut workforce.



SOURCE: LIGHTCAST, 2020; ADVANCECT CALCULATIONS. OCCUPATIONS BASED ON RESEARCH FROM NAVIGANT CONSULTING, NREL, BVG ASSOCIATES, AND MCALLISTER MARINE ENGINEERING.



LOGISTICS AND INFRASTRUCTURE

RENEWABLE ENERGY SECTOR SNAPSHOT



TRANSPORTATION



BY WATER

Three deep water ports in Connecticut: New London, New Haven, and Bridgeport



BY AIR

Hartford port at Bradley International Airport, with 8 additional airports across the state



BY ROAD

Highway I-95 & I-91 connect Canada to Florida
I-84 connects Connecticut to Massachusetts and to New York State



BY RAIL

Connecticut's freight is handled by CSX, Housatonic Railroad, Naugatuck Railroad, PanAm Southern Railway, and Providence & Worcester Railway, serving interstate and intrastate transportation



NEW LONDON

STATE PIER TERMINAL

The only U.S. East Coast site with bridge-free passage that can assemble & ship wind towers.¹



“It is probably the best site for this work between Norfolk, Virginia, and Halifax, Nova Scotia.”

– Joe Nolan
CEO, Eversource¹

IMAGE: CT PORT AUTHORITY, 2022

UNIQUELY POSITIONED WITH OFFSHORE WIND ESSENTIALS:²

Close to offshore wind lease areas with zero overhead obstructions
State of the art, well-protected, deep water, heavy lift port facility
Freight rail link

ROBUST PUBLIC AND PRIVATE SUPPORT:³

\$255M public-private investment
Ørsted and Eversource sign 10-year lease with CT Port Authority

STAGING AND ASSEMBLY:

55-90 wind turbine generator delivery and installation vessels⁴
More than 12,000 Ship and Boat Building jobs in New London⁵

SOURCE: ¹HARTFORD COURANT, 2022; ²U.S. ECONOMIC DEVELOPMENT ADMINISTRATION, 2022; ³CT PORT AUTHORITY, 2022; ⁴REVOLUTION WIND, 2020; ⁵LIGHTCAST, 2021, NORWICH - NEW LONDON MSA.



BRIDGEPORT & NEW HAVEN

BARNUM LANDING, BRIDGEPORT

Multimillion-dollar redevelopment of 18.3-acre waterfront industrial property
Park City Wind construction and staging location^{1,2}

- Storage and assembly of transition pieces
- Steel fabrication and final outfitting
- Operations & maintenance hub for 20+ year project



NEW HAVEN HARBOR

Growing in significance:

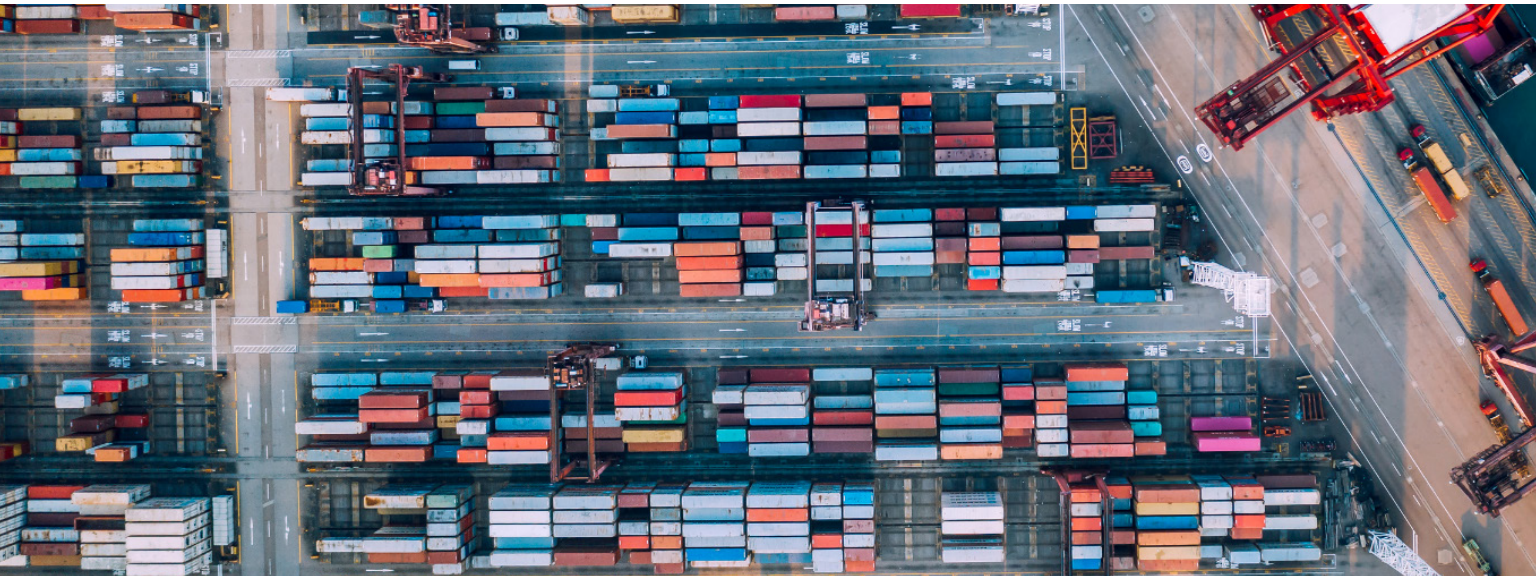
- \$2.5B moved in 2021³
- Value of goods up 158% over 5 years
- 35% increase of vessel traffic from 2020 to 2021⁴

Improvements underway:⁴

- \$63M for dredging and widening of port, safety and efficiency improvements
- \$160M for coastal resiliency: flood walls, roadway protections, pump station

SOURCE: ¹PARK CITY WIND, 2022 ²CT INSIDER, 2022 ³U.S. CENSUS BUREAU USA TRADE, 2021; ADVANCECT CALCULATIONS
⁴NEW HAVEN INDEPENDENT, 2022

*PROJECTS ARE ONGOING; INVESTMENT AMOUNTS LISTED ARE SUBJECT TO CHANGE. FIGURES CURRENT AS OF 12/20/2022.



CONNECTICUT FOREIGN TRADE ZONES

Foreign trade zones were created to encourage activity and value-add at U.S. facilities by allowing delayed or reduced duty payments.

Connecticut has four foreign trade zones and 72 opportunity zones.

Connecticut's FTZs cover almost the entire state:

Bridgeport #76

Fairfield County
Litchfield County
New Haven County (Milford, Orange, Ansonia, Derby, Seymour, Oxford, Beacon Falls, Southbury, Middlebury, Naugatuck, Waterbury, Wolcott)

New Haven #162

New Haven
North Haven

New London #208

New London County
Two tribal lands

Windsor Locks #71

Hartford County
Litchfield County
Middlesex County
Tolland County
Windham County



#13 for production activity of FTZ's
(FOREIGN TRADE ZONE BOARD, 2020)



ADDITIONAL STATE INFRASTRUCTURE INVESTMENT



\$5.3B federal funds over the next 5 years for¹...

- \$1.3B public transit, bus and rail (additional \$85M rail improvement just announced²)
- \$561M bridges
- \$169M transportation resiliency, carbon reduction
- \$55M EV charging stations
- \$53M airport infrastructure³



State funds approved for...

- \$490M transportation, including bus electrification within 10 years⁴
- \$5.9M small harbor improvement projects program⁵

SOURCE: ¹CT OFFICE OF THE GOVERNOR, 2021; ²CT DEPARTMENT OF TRANSPORTATION, 2022; ³CBIA, 2022;

⁴CT MIRROR, 2022; ⁵CT PORT AUTHORITY, 2022.



ZERO CARBON ENERGY ECOSYSTEM

RENEWABLE ENERGY SECTOR SNAPSHOT



SOLAR IN THE CONNECTICUT ECONOMY



**2,275
JOBS (2021)**

**67,621
CURRENT INSTALLATIONS**

**135
COMPANIES**

\$2.8 billion total solar investment in state



SOLAR IS A POPULAR OPTION...

22nd in the U.S. – even though the 3rd smallest state
3.2% of state electricity total

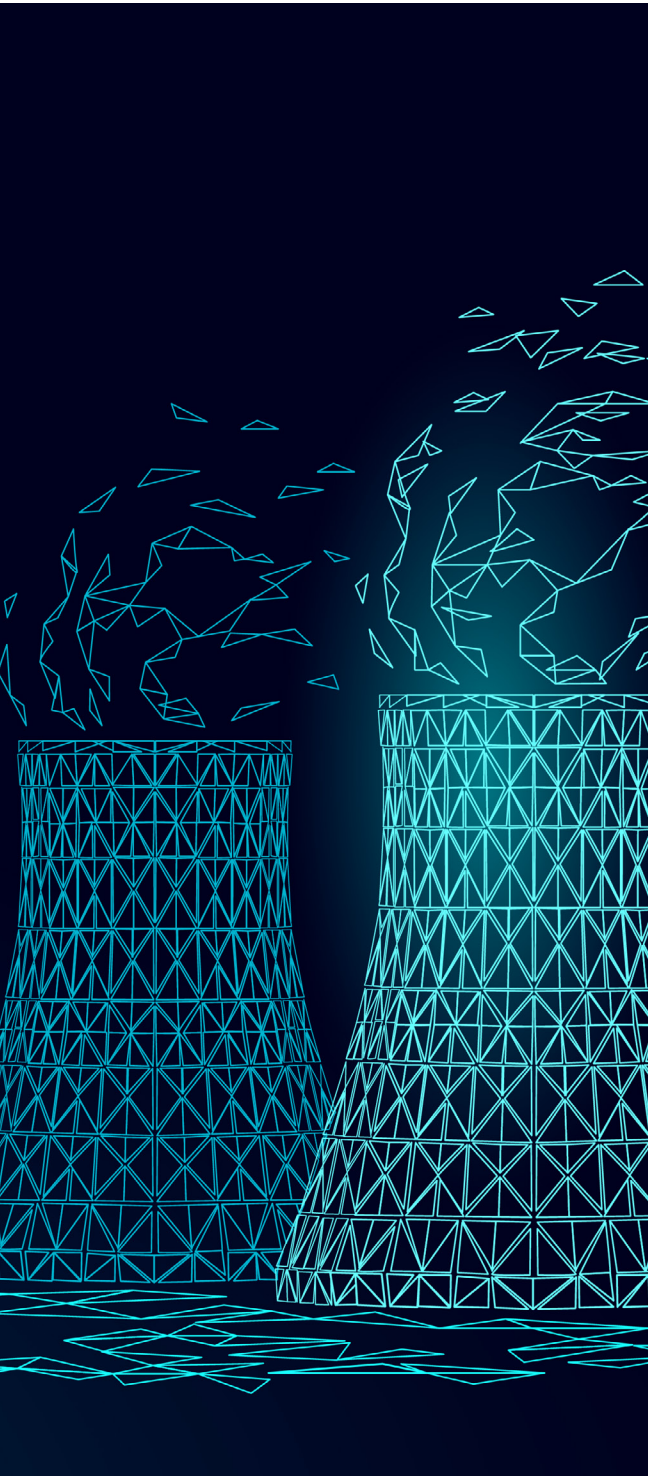


...AND IS GROWING QUICKLY

1,137 MW installed
1,011 MW to be added over next 5 years



NUCLEAR ECONOMIC IMPACT



THE MILLSTONE POWER STATION



**Dominion
Energy**[®]

ABOUT

Produces 16.8MWhs/yr, almost enough for 2 million homes¹
24/7, reliable, low cost, and carbon-free electricity¹

BENEFITS

10-year contract for 9 million MWh pushed CT electric costs
below New England average²

Fixed price agreement allows customers to avoid price
swings³

OPPORTUNITY TO PARTICIPATE

Wholesale provides a rapid path to 100% renewable energy

Purchase **100% clean energy** with
no additional infrastructure

SOURCE: ¹DOMINION ENERGY, 2022; ²CTEXAMINER, 2022;
³HARTFORD COURANT, 2022.



HYDROGEN AND FUEL CELL TECHNOLOGY

U.S. Department of Energy funded advancements:³

UCONN



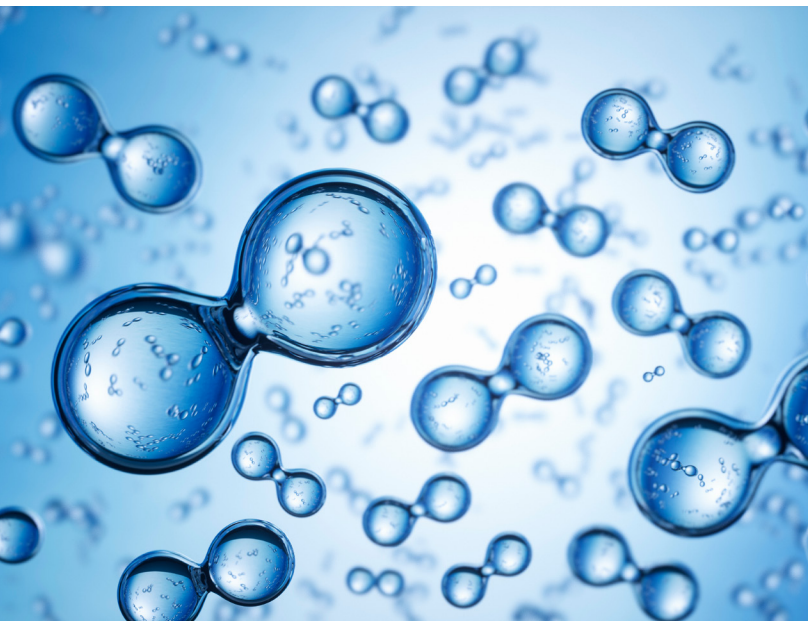
PROTON[®]
ON SITE



SupercoolMetals



ROBUST HYDROGEN DEVELOPMENTS



10 OEMs¹

980+ Direct Jobs¹

600+ Supply Chain Companies¹

\$600+M Revenue and Investment¹

95 Active Fuel Cell Projects²

SOURCE: ¹CONNECTICUT HYDROGEN FUEL CELL COALITION, 2021; ²CONNECTICUT HYDROGEN FUEL CELL COALITION, 2022;
³U.S. DEPARTMENT OF ENERGY, 2020.



Hydrogen is a key part of Connecticut's Comprehensive Energy Strategy¹



Connecticut partnered with New York, New Jersey, Massachusetts, Maine, and Rhode Island in a bid to be one of 4 regional Clean Hydrogen Hubs, part of \$8B in federal Infrastructure Investment and Jobs Act (IIJA) funding.^{2,3}

Focus: Advance safe, hydrogen energy innovation and investment, while improving the region's health, resiliency, and economic development²

Over 60 partners, including:^{2,4,5,6}



SOURCE: ¹CT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION, 2022; ²CT OFFICE OF GOVERNOR, 2022; ³UNIVERSITY OF CONNECTICUT, 2022; ⁴COALITION OF NORTHEASTERN GOVERNORS, 2022; ⁵HYDROGEN CENTRAL, 2022; ⁶NY OFFICE OF GOVERNOR, 2022.



INVESTMENT AND STATE SUPPORT

RENEWABLE ENERGY SECTOR SNAPSHOT



KEY INVESTMENTS

\$5.3 billion raised in 2021 by Connecticut companies committed to green energy.¹
 Every dollar the state invests in clean energy is matched by \$7.5 from the private sector.²



SOURCE: ¹PITCHBOOK, 2022; ADVANCECT CALCULATIONS; ²CT GREEN BANK, 2021.
 COMPANIES BASED ON PITCHBOOK CLEAN TECH AND CLIMATE TECH VERTICALS, AND SELECTED ENERGY AND MATERIALS AND RESOURCES SUBCATEGORIES RELEVANT TO RENEWABLE ENERGY AND ZERO CARBON.



GREENTECH RESOURCES

Connecticut Department of Energy & Environmental Protection¹

A state agency that is committed to making cheaper, cleaner and more reliable energy available has a variety of programs and incentives ranging from EV charging to energy storage.

Connecticut Innovations (CI) ClimateTech Fund²

\$50M investment fund focused on renewable energy, sustainability, and disruptive green technologies

Connecticut Green Bank³ and EnergizeCT⁴

Green energy solutions for property owners, contractors, towns and cities, and capital providers

Future Climate Venture Studio at UCONN⁵

Collaborates with startups addressing the most critical dimensions of the climate challenge, including decarbonization, alternative energy, social impact, and more.

ClimateHaven⁶

Climate focused tech incubator backed by Department of Energy, Yale University, and Connecticut Innovations.

UCONN Center for Clean Energy Engineering (C2E2)⁷

Education, research, and innovation in sustainable energy systems



Hydrogen Fuel Cell Policy Incentives

Mandatory Renewable Portfolio Standards (RPS)

- Interconnection Standards
- Net Metering/Virtual Net Metering
- Public Benefits Funds
- Utility Ownership
- Performance-Based Power Purchase
- Property Assessed Clean Energy Financing (PACE)
- Property Tax Incentives
- ZEV Purchase Incentives
- Refueling Infrastructure Incentives
- Fuel Efficiency Standard

FOR MORE INFORMATION: ¹CT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION, 2023; ²CONNECTICUT INNOVATIONS, 2023; ³CONNECTICUT GREEN BANK, 2023; ⁴ENERGIZE CT; ⁵FUTURE CLIMATE VENTURE STUDIOS, 2022; ⁶NEW HAVEN INDEPENDENT, 2023; ⁷UNIVERSITY OF CONNECTICUT

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LEARN ABOUT CONNECTICUT'S KEY INDUSTRIES AT **ADVANCECT.ORG**

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