



EVALUATION FRAMEWORK SOCIETAL PERSPECTIVE



Economic Development Overview

One of the indicators that the Connecticut Green Bank will be tracking in its programs and overall portfolio is the extent to which investments in clean energy create value from a societal perspective as it relates to the economic development of the state¹. For the Green Bank programs this will be measured as the relationship between investments and associated direct and indirect jobs created. In 2009, and updated in 2016, Navigant Consulting prepared a Connecticut Renewable Energy and Energy Efficiency Economy Baseline Study², which included a focus on the investments in those energy sectors and the resulting job creation. Since that report was prepared, the availability of new clean energy technologies that have emerged (e.g., DER resources, EVs, electric charging stations, etc.), and a variety of related economic factors (e.g., costs of labor, cost of resource acquisition, etc.) have changed. In coordination with the Connecticut Department of Economic and Community Development (DECD) and with assistance from Eversource Energy

and United Illuminating, The Connecticut Green Bank contracted Navigant Consulting to refresh the investment-jobs portion of its earlier study by providing an updated calculator tool to estimate the economic development benefits from clean energy investments in Connecticut, as reflected in job-years created. The updated study focused on jobs associated with the investment area of the Connecticut Green Bank: renewable energy (RE) and energy efficiency (EE) project development and deployment, and product development and manufacturing. The final value output in the jobs calculator is *job-years created per \$1 million invested in clean energy projects in Connecticut*.

The Connecticut Green Bank, through its Evaluation Framework, and specifically its Societal Perspective metrics, will use the findings of this study to estimate, analyze, and report on the economic development benefits of the investment activity in clean energy deployment in Connecticut that it is an integral part of.

Results of RE/EE job-years created to investment analysis

Below is a summary of the results of the analysis of direct, indirect, and induced job-years created by each million-dollar investment in clean energy deployment in Connecticut:

~ 5 job-years for storage tech installers	~ 9 job-years for residential solar installers	~ 14 job-years for commercial EE installers
~ 7 job-years for EV charging installers	~ 11 job-years for fuel cell manufacturers	~ 15 job-years for RTT installers
~ 7 job-years for commercial solar installers	~ 14 job-years for wind project installers	~ 18 job-years for residential EE installers

About the Connecticut Green Bank

The Connecticut Green Bank was established by the Connecticut General Assembly on July 1, 2011 as a part of Public Act 11-80. As the nation's first full-scale green bank, it is leading the clean energy finance movement by leveraging public and private funds to scale-up renewable energy deployment and energy efficiency projects across Connecticut. The Green Bank's success in accelerating private investment in clean energy is helping Connecticut create jobs, increase economic prosperity, promote energy security and address climate change. For more information about the Connecticut Green Bank, please visit www.ctgreenbank.com

About the Department of Economic and Community Development

The Department of Economic and Community Development is the state's lead agency responsible for strengthening Connecticut's competitive position in the rapidly changing knowledge-based global economy. The department administers the Manufacturing Innovation Fund that was created to support and strengthen Connecticut's manufacturing sector. For more information about the Department of Economic and Community Development, please visit www.decd.org

Methodology

1 Calculation of total jobs at top companies:

Interviewed top companies, 22 total (40 researched)

- 12 RE companies interviewed, 17 researched, 60% of market
- 10 EE companies interviewed, 17 researched, 30% of market
- Asked each company for current total number of RE/EE jobs in relevant job classifications and sections of the RE/EE value chain

2 Extrapolation to represent the total industry of CT:

Determined market share for companies in Connecticut RE/EE industry

- Calculated for non-interviewed companies
- If interviewed companies had **X** jobs, representing **Y%** of the market share, then all jobs = $X / Y\%$

3 Estimated jobs created per \$1 Million invested using jobs calculator

This analysis mainly considers direct jobs³ in private companies that employ people who are based in Connecticut. A multiplier for calculating indirect jobs⁴ and induced jobs⁵ from the number of direct jobs was provided by DECD for the study.

Example of Jobs Calculator:

Residential Solar

In the example below, the Connecticut Green Bank would apply the Societal Perspective to report the economic development results in its Comprehensive Annual Financial Report in the following manner: **"In FY 2016 there was a total investment of \$240 million in Residential Solar PV in Connecticut. Through the Connecticut Green Bank's support, over 936 direct and 312 indirect and induced job-years were created in the state from installing nearly 60 MW of Residential Solar PV."**

Occupation <i>Solar PV Installation – Residential</i>	Capital Invested	Company Overhead and Margin	Project Cost after Overhead and Margin	Labor (% of project cost)	Non-labor Costs (% of project costs)
	A	B	C=A×(1-B)	D	E=100%-D
	\$1,000,000	20%	\$800,000	35%	65%
Weighted Average Wage	Fully Burdened Employee Cost	Job-years Created per Million Dollars Invested	Indirect and Induced Job Multiplier	Indirect and Induced Jobs Created from Capital Invested	Total Job Years Created from Capital Invested
F	G=F×1.3	H=C×(D/G)	I	J=H×I	K=H+J
\$55,000	\$71,500	3.9	1.3	5.1	9.0

Key Findings

Renewable Energy: Employment in the solar industry has grown by approximately 30% since 2010 to become the largest RE industry for jobs in Connecticut.

- The majority of RE jobs are split between the solar and fuel cell industries, with other RE technologies making up the remaining 6% of RE industry jobs
- Installation and engineering jobs account for the largest job type at solar companies
- Manufacturing and engineering jobs account for the largest job types at fuel cell companies
- The majority of solar employees in Connecticut focus on the residential market

Energy Efficiency: Overall employment has remained relatively constant, experiencing most job growth in the residential customer market.

- EE technologies mainly include lighting, HVAC, and building envelope, with the majority of companies participating in multiple technologies
- Installation jobs account for the majority of roles
- Most jobs are focused on residential and C&I customer markets, with the remaining focused on retail and utility
- The average number of employees at C&I companies is 90-120, while it is 10-40 at residential companies

¹ See Section 7 of Connecticut Green Bank's Evaluation Framework: Assessing, Monitoring, and Reporting of Program Impacts and Process (July 2016)

² Connecticut Renewable Energy and Energy Efficiency Economy Baseline study, Navigant Consulting, Inc. [Completed in March 2009 and subsequently updated in 2010]

³ These are existing jobs in the specified Connecticut industries.

⁴ Represents the response as supplying industries increase output in order to accommodate the initial change in final demand.

⁵ Generated by the spending of households who benefit from the additional wages and business income they earn through direct and indirect activity.