



Comprehensive Plan

Green Bonds US



Comprehensive Plan

Fiscal Year 2020 & Beyond

July 2019

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1. Executive Summary

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

Alexis de Tocqueville, Democracy in America

Although Connecticut is one of the smallest states in the country, its decades of legislative leadership on climate change has had an influential impact across the country and around the world. One example of this was on July 1, 2011, when in a bipartisan manner, Public Act (“PA”) 11-80¹ was passed. Within Section 99 of that seminal act, the nation’s first state-level green bank was formed. There are now over twenty green banks (and growing) at the local and state level, including several nonprofits, working together to increase and accelerate the growth of investment in clean energy and environmental infrastructure across the United State.² The Connecticut Green Bank (“the Green Bank”) is a public policy innovation, a catalyst that helps mobilize greater local and global investment to address climate change.

Since its inception, the Green Bank has mobilized over \$2.1 billion of investment into Connecticut’s clean energy economy at nearly a 8 to 1 leverage ratio of private to public funds, supported the creation of over 25,000 direct, indirect, and induced job-years, reduced the energy burden on nearly 57,000 families (in particular low-to-moderate income (“LMI”) families) and businesses, deployed nearly 495 MW of clean energy that will help avoid over 10.6 million tons of CO₂ emissions and save over \$302 million of public health costs over the life of the projects, and helped generate over \$106 million in individual income, corporate, and sales tax revenues to the State of Connecticut.³

As a result of the Green Bank’s success as an integral public policy tool addressing climate change in Connecticut, there has been growing national public policy interest at the local, federal,⁴ and international⁵ levels to realize similar results. This green bank movement is about increasing and accelerating the flow of private capital into markets that energize the green economy to confront climate change and provide all of society a healthier, more prosperous future. As the “spark” to the green bank movement, the Green Bank continues to be recognized for its innovation through receiving the prestigious 2017 Innovations in American Government Awards by the Ash Center at Harvard University’s Kennedy School of Government,⁶ Innovation

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

² American Green Bank Consortium – www.greenbankconsortium.org

³ Data collected and analyzed through the data warehouse through June 30, 2021

⁴ In the 117th Congress, Senators Markey and Van Hollen introduced the National Climate Bank Act (S. 283), Representative Dingell introduced a counterpart Clean Energy & Sustainability Accelerator Act (H.R. 806), and President Biden included the Clean Energy & Sustainability Accelerator within the American Jobs Plan.

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

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

and Green Bond Structure Awards by Environmental Finance in 2020, and Innovative Deal of the Year by Bond Buyer in 2020.

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

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

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

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

- **Commitment to Address Climate Change** – as the most urgent issue to address, the Green Bank needs to increase and accelerate the impact of its model to support the implementation of Connecticut's climate change plan,¹⁰ including becoming more resilient to the impacts of climate change;¹¹
- **Scaling Up Investment and Impact in Connecticut and Beyond** – in order to achieve the climate change goals set forth, more investment from private capital sources leveraged

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

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

⁹ "Connecticut Green Bank 2.0 – From 1 to 2 Orders of Magnitude" at the Pocantico Conference Center of the Rockefeller Brothers Fund (February 6-7, 2019) – https://www.ctgreenbank.com/wp-content/uploads/2019/08/Green-Bank_Strategic-Retreat_Summary_February-2019.pdf

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

¹¹ Public Act 18-82 "An Act Concerning Climate Change Planning and Resiliency"

by innovative public sector financing will be needed to scale-up and scale-out the green bank model's impact; and

- **Green Bonds to Increase Access to Capital** – with the ability to issue bonds, the Green Bank is able to increase its access to capital beyond the current sources of funding to scale-up its investment activity, while providing more opportunities to engage citizens in new ways to invest in the state's growing green economy, including through the issuance of Green Liberty Bonds that will engage citizens in making investments alongside the Green Bank.¹²

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

Investment for the sake of investment is not enough unless we have an engaged citizenry that is active in communities across the state! Whether through markets or within communities in partnership with other community-based organizations, the Green Bank is bringing people together and strengthening the bonds we share with one another. In order to confront climate change and provide all of society a healthier and more prosperous future by increasing and accelerating the flow of private capital into markets that energize the green economy, the Green Bank calls its Comprehensive Plan "Green Bonds US", to promote a simple but critically important message; green bonds us – the environment unites us.

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

2. Organizational Overview

The Green Bank¹³ was established by Governor Malloy and Connecticut's General Assembly on July 1, 2011 through PA 11-80 as a quasi-public agency that supersedes the former Connecticut Clean Energy Fund ("CCEF"). On July 1, 2021, the 10th anniversary of the Green Bank, Governor Lamont and Connecticut's General Assembly enacted PA 21-115 expanding the scope of the Green Bank beyond "clean energy" to include "environmental infrastructure". As the nation's first

¹² In honor of the 50th anniversary of Earth Day, the Green Bank created the Green Liberty Bond – <https://www.ctgreenbank.com/green-liberty-bond-new-investment-opportunity/>

¹³ PA 11-80 repurposed the Connecticut Clean Energy Fund (CCEF) administered by Connecticut Innovations, into a separate quasi-public organization called the Clean Energy Finance and Investment Authority (CEFIA). Per Public Act 14-94, CEFIA was renamed to the Connecticut Green Bank.

state green bank, the Green Bank leverages public and private funds to drive investment and scale-up clean energy deployment and environmental infrastructure improvement in Connecticut.

The Green Bank's statutory purposes are:

- To develop programs to finance and otherwise support clean energy and environmental infrastructure investment in residential, municipal, small business and larger commercial projects and such other programs as the Green Bank may determine;
- To support financing or other expenditures that promote investment in clean energy sources and environmental infrastructure to foster the growth, development and commercialization of clean energy sources, environmental infrastructure, and related enterprises; and
- To stimulate demand for clean energy and the deployment of clean energy sources and investment in environmental infrastructure within the state that serves end-use customers in the state.

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

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

- **Governor Rowland** – co-chaired the New England Governors and Eastern Canadian Premiers Conference, which established a regional commitment to reduce GHG emissions (i.e., 1990 levels by 2010, 10% below 1990 levels by 2020, and 80% below 2001 levels by 2050);¹⁴
- **Governor Rell** – supported Public Act 08-98¹⁵ codifying the regional commitment into state law, appointing Gina McCarthy to be the Commissioner of the Department of Environmental Protection who would help lead the development of the Regional Greenhouse Gas Initiative ("RGGI") and later become the EPA Administrator under President Obama leading the development of the Clean Power Plan and the U.S. participation in the Paris Agreement and the White House National Climate Advisor under President Biden;
- **Governor Malloy** – led the passage of PA 11-80 establishing the Department of Energy and Environmental Protection ("DEEP"), creating the Green Bank, and other policies catalyzing the market for clean energy, as well as PA 18-50¹⁶ and PA 18-82¹⁷ increasing the state's renewable portfolio standard ("RPS") ("RPS") to 40% by 2030 and establishing

¹⁴ NEG-ECP Resolution 26-4 adopting the "Climate Change Action Plan 2001" (August 2001 in Westbrook, CT)

¹⁵ An Act Concerning Connecticut Global Warming Solutions

¹⁶ An Act Concerning Connecticut's Energy Future

¹⁷ An Act Concerning Climate Change Planning and Resiliency

a midterm GHG emissions reduction target of 45% below 2001 levels by 2030, respectively; and

- **Governor Lamont** – issued his first¹⁸ and third¹⁹ executive orders on state “lead by example” for sustainability and clean energy and climate change leadership respectively, including a 100% zero emission electricity target by 2040, and led the passage of PA 21-115 expanding the scope of the Green Bank to include “environmental infrastructure”.

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

2.1 Vision

...a planet protected by the love of humanity.

2.2 Mission

Confront climate change and provide all of society a healthier and more prosperous future by increasing and accelerating the flow of private capital into markets that energize the green economy.²⁰

2.3 Goals

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

1. To leverage limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut.
2. To strengthen Connecticut’s communities, especially vulnerable communities,²¹ by making the benefits of the green economy inclusive and accessible to all individuals, families, and businesses.
3. To pursue investment strategies that advance market transformation in green investing while supporting the organization’s pursuit of financial sustainability.

¹⁸ <https://portal.ct.gov/-/media/Office-of-the-Governor/Executive-Orders/Lamont-Executive-Orders/Executive-Order-No-1.pdf>

¹⁹ <https://portal.ct.gov/-/media/Office-of-the-Governor/Executive-Orders/Lamont-Executive-Orders/Executive-Order-No-3.pdf>

²⁰ Reducing greenhouse gas emissions and confronting climate change is supported by a number of public policies, including, but not limited to PA 17-3, PA 18-82, PA 19-71, Governor Lamont’s Executive Orders 1 and 3, Comprehensive Energy Strategy, Governor Malloy’s Council on Climate Change, and many other past acts, plans, or policies.

²¹ Per PA 20-05, “An Act Concerning Emergency Response by Electric Distribution Companies, the Regulation of Other Public Utilities and Nexus Provisions for Certain Disaster-Related or Emergency-Related Work Performed in the State,” “vulnerable communities” means populations that may be disproportionately impacted by the effects of climate change, including, but not limited to, low and moderate income communities, environmental justice communities pursuant to section 22a-20a, communities eligible for community reinvestment pursuant to section 36a-30 and the Community Reinvestment Act of 1977, 12 USC 2901 et seq., as amended from time to time, populations with increased risk and limited means to adapt to the effects of climate change, or as further defined by DEEP in consultation with community representatives. Inclusion of “vulnerable communities” within the goals of the Green Bank would ensure that its incentive (e.g., RSIP), financing (e.g., multifamily), and investment (e.g., Green Bank Capital Solutions) programs incorporate it as a priority.

The vision, mission, and goals support the implementation of Connecticut’s clean energy policies be they statutorily required (e.g., CGS 16-245ff on Residential Solar Investment Program (“RSIP”)), planning (e.g., Comprehensive Energy Strategy), or regulatory (e.g., Docket No. 17-12-03 on grid modernization) in nature.

2.4 Definitions – Clean Energy and Environmental Infrastructure

The Green Bank’s investment focus is on “clean energy” and “environmental infrastructure” as defined by CGS Section 16-245n:

- **Clean Energy** – clean energy means solar photovoltaic energy, solar thermal, geothermal energy, wind, ocean thermal energy, wave or tidal energy, fuel cells, landfill gas, hydropower that meets the low-impact standards of the Low-Impact Hydropower Institute, hydrogen production and hydrogen conversion technologies, low emission advanced biomass conversion technologies, alternative fuels, used for electricity generation including ethanol, biodiesel or other fuel produced in Connecticut and derived from agricultural produce, food waste or waste vegetable oil, provided the Commissioner of Energy and Environmental Protection determines that such fuels provide net reductions in GHG emissions and fossil fuel consumption, usable electricity from combined heat and power systems with waste heat recovery systems, thermal storage systems, other energy resources and emerging technologies which have significant potential for commercialization and which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission, financing of energy efficiency projects, projects that seek to deploy electric, electric hybrid, natural gas or alternative fuel vehicles and associated infrastructure, any related storage, distribution, manufacturing technologies or facilities and any Class I renewable energy source, as defined in section 16-1.
- **Environmental Infrastructure** – structures, facilities, systems, services and improvement projects related to (A) water, (B) waste and recycling, (C) climate adaptation and resiliency, (D) agriculture, (E) land conservation, (F) parks and recreation, and (G) environmental markets, including, but not limited to carbon offsets²² and ecosystem services.²³

3. Governance and Organizational Structure

The Green Bank is overseen by a governing Board of Directors (“BOD”) comprised of ex officio and appointed members, while the organization of the Green Bank is administered by a professional staff overseeing three business units – Incentive Programs, Financing Programs, and Environmental Infrastructure Programs.

²² Carbon offsets means an activity that compensates for the emission of carbon dioxide or other greenhouse gases by providing for an emission reduction elsewhere.

²³ Ecosystem services means benefits obtained from ecosystems, including, but not limited to, (A) provisioning services such as food and water, (B) regulating services such as floods, drought, land degradation and disease, and (C) supporting services such as soil formation and nutrient cycling.

3.1 Governance

Pursuant to Section 16-245n of the CGS, the powers of the Green Bank are vested in and exercised by a BOD ²⁴ that is comprised of twelve voting and one non-voting members each with knowledge and expertise in matters related to the purpose of the organization – see Table 1.²⁵

Table 1. Board of Directors of the Connecticut Green Bank

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

There are four (4) committees of the BOD of the Green Bank, including Audit, Compliance, and Governance Committee (“ACG Committee”), Budget, Operations, and Compensation Committee (“BOC Committee”), Deployment Committee, and the Joint Committee of the Energy Efficiency Board (“EEB”) and the Green Bank.²⁶

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

The EEB and the Green Bank have a shared goal to implement state energy policy throughout all sectors and populations of Connecticut with continuous innovation towards greater leveraging of ratepayer funds and a uniformly positive customer experience.

The BOD of the Green Bank is governed through enabling legislation, as well as by an [Ethics Statement](#) and [Ethical Conduct Policy](#), [Resolutions of Purposes](#), [Bylaws](#), [Joint Committee Bylaws](#), and a Comprehensive Plan. All meetings, agendas, and materials of the Green Bank’s BOD and its Committees are publicly available on the organization’s website.^{27,28}

3.2 Organizational Structure

The organizational structure of the Green Bank is comprised of three (3) business units, including:

²⁴ <https://www.ctgreenbank.com/about-us/governance/board-of-directors/>

²⁵ <https://www.ctgreenbank.com/about-us/governance/>

²⁶ Pursuant to Section 16-245m(d)(2) of the CGS

²⁷ <http://www.ctgreenbank.com/about-us/board-member-resources/connecticut-grboard-meetings/>

²⁸ <http://www.ctgreenbank.com/about-us/board-member-resources/connecticut-grittee-meetings/>

- **Incentive Programs** – the Governor and the Connecticut General Assembly from time-to-time may decide that there are certain incentive (or grant) programs that they seek to have the Green Bank administer (e.g., CGS 16-245ff). The Green Bank administers such programs with the goal of delivering on the public policy objectives, while at the same time ensuring that funds invested by the Green Bank are cost recoverable. For example, the Green Bank administers the RSIP whereby through a declining incentive block structure no more than 350 MW of new residential solar PV systems are deployed, while nurturing the sustained, orderly development of a local state-based solar PV industry. Through the public policy creation of a Solar Home Renewable Energy Credit (“SHREC”), the Green Bank is able to recover its costs for administering the RSIP by selling such credits to the Electric Distribution Companies (“EDCs”) through a Master Purchase Agreement (“MPA”) to support their compliance under Connecticut Class I RPS. Costs recovered from such mechanisms (i.e., earned revenues from SHRECs) are expected to cover the incentive, administrative expenses, and financing expenses of the Incentive Programs business unit.

- **Financing Programs** – the Green Bank’s core business is financing clean energy projects. The Green Bank’s focus is to leverage limited public funds to attract and mobilize multiples of private capital investment to finance these projects. In other words, the use of resources by the Green Bank (e.g., public revenues including the Clean Energy Fund (“CEF”) and RGGI allowance proceeds) are to be invested with the expectation of principal and interest being paid back over time (i.e., earned revenues). For example, the Green Bank administers the Commercial Property Assessed Clean Energy (“C-PACE”) program. Through C-PACE, the Green Bank provides capital to building owners to make clean energy improvements on their properties that is paid back over time from a benefit assessment on the building owner’s property tax bill. The interest earned from these types of investments, over time, is expected to cover the operational expenses and a return for the Financing Programs business unit.

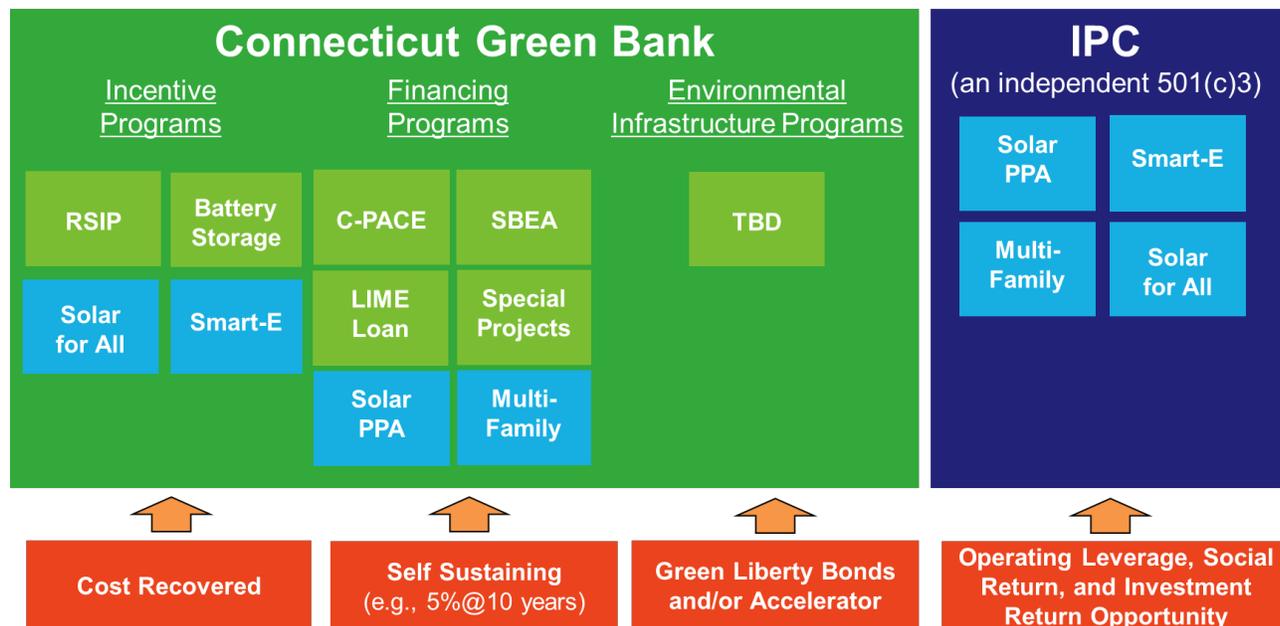
- **Environmental Infrastructure Programs** – as a result of the passage of PA 21-115 expanding the scope of the Green Bank beyond “clean energy” to include “environmental infrastructure,” in FY22 the Green Bank will develop a Comprehensive Plan for the review and approval by the BOD for implementation in FY23.

These three business units – Incentive Programs and Financing Programs (i.e., for “clean energy”) and Environmental Infrastructure Programs – serve the purposes of the Green Bank. To support the business units and their investments, the Green Bank has administrative support from finance, legal, marketing and operations.

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

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

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



4. Incentive Programs

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

Per CGS 16-245ff, updated by PA 19-35²⁹, the Green Bank administers the RSIP that includes a declining incentive block structure to deploy no more than 350 megawatts of new residential solar PV systems on or before December 31, 2022, while promoting the sustained, orderly development of a local state-based solar PV industry. The RSIP also requires that participating households undergo a Home Energy Solutions (“HES”) or Home Energy Solutions – Income Eligible (“HES-IE”) assessment, or equivalent audit. It should be noted that the Green Bank has also strategically sought to ensure that households in vulnerable communities (e.g., low-and-

²⁹ An Act Concerning a Green Economy and Environmental Protection

moderate income households) have equal access to residential solar PV.³⁰ Through the Solar for All program, the Green Bank and its partners are enabling households to reach “solar parity” such that the proportion of solar PV installed on low-and-moderate income households is no less than non-low-and-moderate income households, or “beyond solar parity” for communities of color whereby Black and Hispanic households are proportionately installing solar PV more than White households.

As of June 30, 2021, 370.4 megawatts of residential solar PV systems have been approved through RSIP, supporting 45,702 projects across the state and over \$1.406 billion of investment.³¹ Of these approved projects, 341.6 MW have been completed – or nearly 98 percent of the statutory target. Starting January 1, 2022, the residential solar PV market will transition from net metering to a tariff-based compensation structure.³²

To support the Green Bank’s implementation of the RSIP, the EDCs are required to purchase the SHRECs to assist them in their compliance with the RPS. The SHREC price is established by the Green Bank to recover its costs for administering the RSIP through a 15-year MPA with the EDCs. The cash flow from the sale of current and future SHRECs produced by these systems can be sold as a “green bond”³³ to generate cash flow upfront to support the cost recovery of the program – see Figure 2.

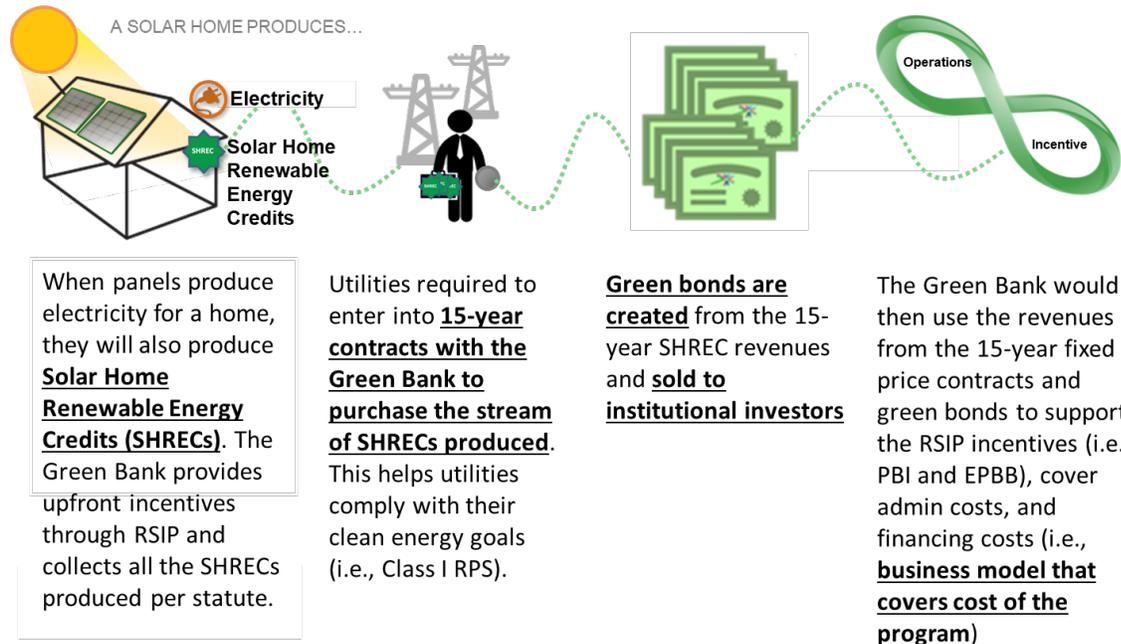
³⁰ Sharing Solar Benefits – Reaching Households in Underserved Communities of Color in Connecticut by the Connecticut Green Bank (May 2019) – [click here](#).

³¹ Prior to the RSIP, through incentives provided by the CCEF, the predecessor of the Green Bank, there are another 2,018 residential solar PV projects totaling 13.4 MW.

³² See Docket No. 20-07-01

³³ <https://www.ctgreenbank.com/cgb-enters-green-bond-market/>

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



It should be noted that in FY 2020 and continuing into FY 2021, the COVID-19 public health crisis destabilized the local residential solar industry. As a result, in order to ensure that the Green Bank is “fostering the sustained orderly development of a local solar industry,” the BOD of the Green Bank approved an extension of the RSIP (i.e., RSIP-E) by 32 MW to (1) ensure that 350 MW of residential solar PV is completed, and (2) provide additional incentive capacity to stabilize the industry as it manages through COVID-19 and the transition from net metering to a tariff.³⁴ This extension also provided the local solar industry an opportunity to engage the Connecticut General Assembly to debate the need for an increase in the 350 megawatt target. At the conclusion of the 2021 legislative session, there was no increase in the RSIP target.

In order to ensure the sustained, orderly development of the local solar industry beyond the conclusion of the RSIP, the Green Bank actively engaged in the regulatory process (i.e., Docket No. 20-07-01) overseen by the Public Utilities Regulatory Authority (“PURA”) to establish the soon-to-be EDC-administered residential renewable energy tariff program under CGS 16-244z. As a result of this nearly yearlong process, through the Green Bank’s engagement, the following key program designs were included:

- **Reasonable Rate of Return** – per CGS 16-244z, a just, reasonable, and adequate rate of return of between 9 to 11 percent was determined (i.e., equivalent to \$0.2900/kWh in 2021) for the 20-year tariff through the Green Bank’s inclusion of an objective analysis of the RSIP;

³⁴ <https://www.ctgreenbank.com/about-us/governance/connecticut-grboard-meetings/2020-2/> - see September 23, 2020 materials for details.

- **HES or HES-IE Requirement** – to continue the linkage between energy efficiency and solar PV, an important objective of the Joint Committee, the Green Bank advocated for a HES or HES-IE requirement as part of every residential solar PV project supported by the tariff;
- **Additional Incentives for Vulnerable Communities** – given the success of the RSIP in reaching vulnerable communities, the Green Bank wanted to ensure that solar PV was affordable and accessible to LMI households and adders for low income (i.e., \$0.0250/kWh) or households located in distressed municipalities³⁵ (i.e., \$0.0125/kWh) over the 20-year tariff were determined; and
- **Direct Payment** – due to the perceived risks of underwriting financing (i.e., loans, leases, or power purchase agreements (“PPAs”)) for vulnerable communities, the Green Bank advocated for direct payments of the tariff rates from the EDCs to a third-party in-part or in-whole as a way to reduce risk and therefore make solar PV more affordable and accessible to vulnerable communities. This provides a financing mechanism that would allow the Green Bank to provide investment in developers serving vulnerable communities.

These key program design inclusions within the EDC-administered tariff program will improve the program’s likelihood of success in deploying no less than fifty (50) megawatts of new residential solar PV a year, while ensuring that vulnerable communities have continued opportunities to reduce the burden of energy costs that they experienced through the RSIP.

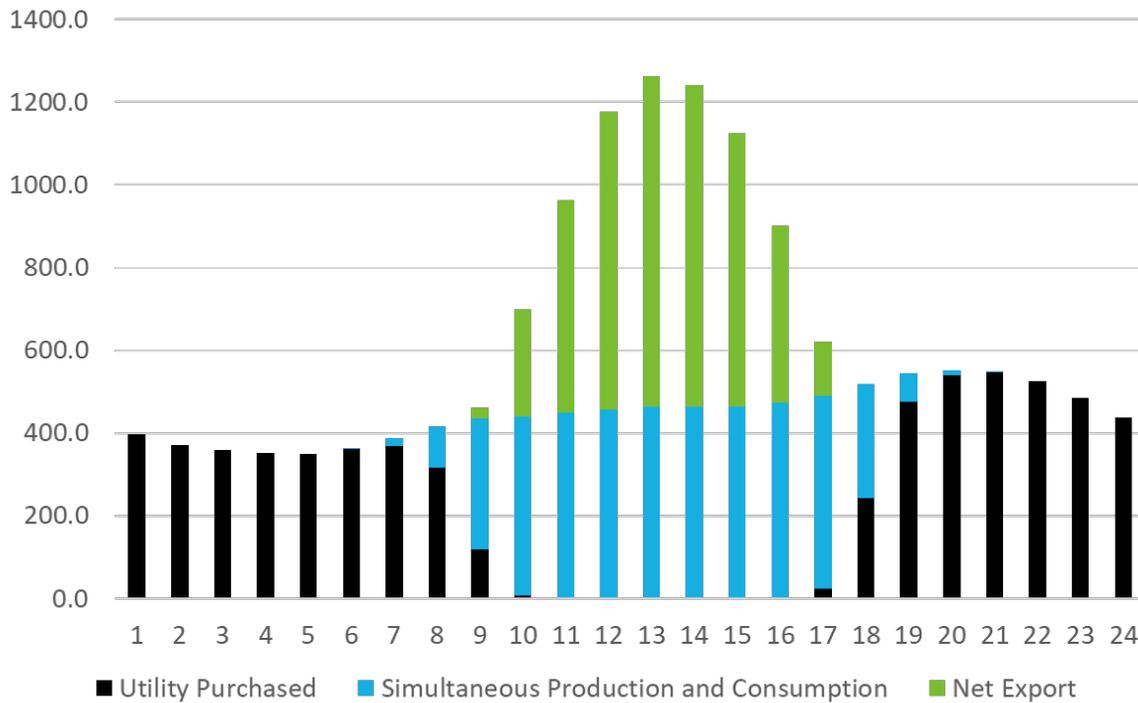
Beyond the SHRECs and RECs created through the RSIP and RSIP-E respectively, the Green Bank, through its partner C-Power, aggregates and registers residential solar PV systems in ISO-NE’s On-Peak Hours Resource Program for which it receives Forward Capacity Market payments.³⁶

In general, over the course of a year, a typical residential solar PV system produces, and the household simultaneously consumes, about fifty percent of the production from the system – meaning that about fifty percent of the system’s production is being exported to the grid (and generally used subsequently by the household under the existing net metering policy) – see Figure 3. Beginning on January 1, 2022, all new behind the meter residential renewable energy systems will no longer be able to access net metering, but instead be subject to a tariff-based form of compensation (i.e., a credit for every kWh of energy produced from such systems over a 20-year period).

³⁵ https://portal.ct.gov/DECD/Content/About_DECD/Research-and-Publications/02_Review_Publications/Distressed-Municipalities

³⁶ <https://www.iso-ne.com/markets-operations/markets/forward-capacity-market>

Figure 3. Average Residential Consumption (i.e., kWh) and Solar PV Production Over the Course of a Year by Hour of the Day



In order to store the system’s production that would have been exported to the grid for the purposes of later using it for (1) back-up power that would benefit the household, and/or (2) reducing demand, specifically peak demand, that would benefit all ratepayers, in FY 2019, the Green Bank submitted an application into the Electric Efficiency Partners Program (“EEPP”) (i.e., Docket No. 18-12-35) demonstrating the “cost effectiveness” of residential solar PV in combination with battery storage.³⁷ In FY 2021, the Green Bank submitted its “Solarize Storage” proposal into the Public Utility Regulatory Authority’s (“PURA”) Equitable Modern Grid process (i.e., Docket No. 17-12-03(RE03)),³⁸ an incentive program with a focus on combined residential solar PV and battery storage that maximizes participant benefits while sharing those benefits with ratepayers and society. This proposal was used by PURA within the Docket as a straw proposal from which a 580 MW residential and non-residential battery storage incentive program would be implemented. During the 2021 legislative session, PA 21-53 “An Act Concerning Energy Storage” was unanimously passed establishing a 1000 MW target by 2030, including residential and non-residential behind the meter installations and front of the meter grid tied solutions, and potential program implementers to include DEEP, Green Bank, EDCs, or other third parties. In collaboration with DEEP and the EDCs through the Joint Committee,³⁹ efforts are being made to enable residential solar PV in combination with battery storage to deliver greater benefits to participating households as well as all ratepayers on the electric grid – through a combination

³⁷ Section 94 of PA 07-242

³⁸ <https://www.ctgreenbank.com/wp-content/uploads/2020/08/PURA-Docket-No.-17-12-03RE03—Solarize-Storage-Proposal-from-the-Green-Bank.pdf>

³⁹ Pursuant to Section 16-245m(d)(2) of the CGS

upfront incentive in support of passive demand response through the Green Bank in conjunction with a performance-based incentive in support of active demand response through the EDCs administration of the Connected Solutions Program. The Green Bank is now working with the EDCs to support PURA’s recent interim decision within the docket.

The EnergizeCT Smart-E Loan in partnership with local community banks and credit unions, provides easy access to affordable capital for homeowners to finance clean energy, as well as environmental infrastructure improvements (e.g., health & safety, water, resiliency) on their properties through a partnership between local contractors and financial institutions, IPC, and the Green Bank. As the Green Bank provides credit enhancements to the Smart-E Loan in the form of interest rate buydowns (i.e., subsidy) and loan loss reserves from its balance sheet, it is considered an Incentive Program since there is no direct financial return (e.g., earned revenues) to the organization like Financing Programs.

The Green Bank has set targets for its Incentive Programs business unit for FY 2020,⁴⁰ FY 2021,⁴¹ and FY 2022 in terms of the number of projects, total investment (i.e., public and private), and installed capacity – see Tables 2 through 4.

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

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)
Residential Solar Investment Program	7,059	\$214.2	60,000
Solar for All Program	615	\$17.2	4,200
Electric Efficiency Partners Program ⁴²	0-500	\$0.0-\$5.5	0-2,000
EnergizeCT Smart-E Loan	<u>540</u>	<u>\$7.2</u>	<u>500</u>
Total⁴³	8,099	\$226.9	62,500

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

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Residential Solar Investment Program	3,177-4,706	\$96.7-\$143.2	27,000-40,000	16,995-25,178

⁴⁰ Revised by the BOD on January 24, 2020

⁴¹ It should be noted that there are two factors impacting the FY 2021 targets for the RSIP – COVID-19 impacts on market demand and achieving the 350 MW target – and therefore, the low and high range for the targets.

⁴² The Green Bank has submitted a Technology Application (i.e., Docket No. 18-12-35) into PURA through the EEPP in support of a residential battery storage incentive program that would retrofit existing residential solar PV systems installed through the RSIP. Beyond existing solar PV systems that could be retrofit with battery storage, RSIP Step 15 proposes a combined residential solar PV and battery storage upfront incentive for new installations that demonstrates significant “cost effectiveness” of distributed energy systems. Meeting this target was contingent upon PURA’s determination in Docket No. 18-12-35. There was not yet a determination by PURA in the docket, and therefore the revision.

⁴³ The total does not count Solar for All projects separately because all Solar for All projects are also RSIP projects and therefore already counted.

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Solar for All Program	177-416	\$4.3-\$10.1	1,200-2,700	724-1,700
Equitable Modern Grid ⁴⁴	0-100	\$0.0-\$0.9	0-500	-
EnergizeCT Smart-E Loan	270-740	\$3.6-\$9.8	300-1,000	1,972-3,911
Total⁴⁵	3,447-5,581	\$100.3-\$153.0	27,300-41,500	19,691-30,789

Table 4. Revised FY 2022 Targets for the Incentive Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Residential Solar Investment Program	1732	\$63.0	16,800	29,605
Solar for All Program	96	\$2.5	660	1,154
Energy Storage Solutions	202	\$5.8	2,500	-
EnergizeCT Smart-E Loan	800	\$11.2	800	15,168
Total⁴⁶	1,633	\$36.6	9,800	22,217

Starting in FY 2021, the Green Bank has added annual GHG emissions avoided (see Tables 3 and 4) and investment in vulnerable communities (see bullet below) as targets for its Incentive Programs.

- By 2025, no less than 40 percent of investment and benefits (e.g., jobs) from Incentive Programs is directed to vulnerable communities.

As a result of successfully achieving these targets, the Green Bank will reduce the energy burden on and improve the resiliency from climate change for Connecticut families, especially those in vulnerable communities, create jobs in our communities, raise tax revenues for the State of Connecticut, and reduce air pollution causing local public health problems and contributing to global climate change.

5. Financing Programs

The Green Bank manages financing programs. That is to say that it oversees financing programs that provide capital upfront (i.e., public revenues including CEF and RGGI) to deploy clean energy, while at the same time returning principal and interest (i.e., earned revenues) over time from the

⁴⁴ The Green Bank will be submitting a proposal into Docket No. 17-12-03(RE03) – Electric Storage. Should the Request for Proposed Designs (“RFPD”) be accepted by PURA, then the Green Bank would anticipate administering an upfront electric storage incentive program beginning January 1, 2021.

⁴⁵ The total does not count Solar for All projects separately because all Solar for All projects are also RSIP projects and therefore already counted.

⁴⁶ The total does not count Solar for All projects separately because all Solar for All projects are also RSIP projects and therefore already counted.

financing of projects, products, or programs to ensure the financial sustainability of the business unit.

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

- **C-PACE**⁴⁷ – enables building owners to pay for clean energy improvements over time through a voluntary benefit assessment on their property tax bills. This process makes it easier for building owners to secure low-interest capital for up to 25 years to fund energy improvements and is structured so that energy savings more than offset the benefit assessment.
- **Green Bank Solar PPA** – third-party ownership structure to deploy solar PV systems for commercial scale end-use customers (e.g., businesses, nonprofits, municipal and state governments, affordable multifamily properties, etc.) that uses a multi-year PPAs”)to finance projects while reducing energy costs for the host customer.
- **Small Business Energy Advantage (“SBEA”)** – Eversource Energy administered on-bill commercial energy efficiency loan program for small businesses, in partnership with low-cost capital provided by Amalgamated Bank with a credit enhancement from the Green Bank (i.e., subordinated debt) and the Connecticut Energy Efficiency Fund (i.e., loan loss guaranty and interest rate buydown).
- **Multifamily Products** – defined as buildings with 5 or more units, the Green Bank provides a suite of financing options through IPC and Capital for Change (a Community Development Financial Institution or “CDFI”) that support property owners to assess, design, fund, and monitor high impact clean energy and health & safety improvements for their properties.
- **Special Projects** – as opportunities present themselves, the Green Bank from time-to-time invests as part of a capital structure in various projects (e.g., fuel cell, hydropower, food waste to energy, state “Lead by Example” energy service agreements, etc.). These projects are selected based on the opportunity to expand the organization’s experience with specific technologies, advance economic development in a specific locale, or to drive adoption of clean energy that would otherwise not occur, while also earning a rate of return.

The Green Bank has set targets for its Financing Programs business unit for FY 2020,⁴⁸ FY 2021,⁴⁹ and FY 2022 in terms of the number of projects, total investment (i.e., public and private), and installed capacity – see Tables 5 through 7.

⁴⁷ CGS 16a-40g

⁴⁸ Revised by the BOD on January 24, 2020

⁴⁹ Given the uncertain impacts of COVID-19, low and high range targets were proposed.

Table 5. Revised FY 2020 Targets for the Financing Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)
Commercial PACE	56	\$25.0	7,000
Green Bank Solar PPA	33	\$28.0	12,600
Small Business Energy Advantage ⁵⁰	1,000	\$20.0	-
Multifamily Predevelopment Loan	2	\$0.1	-
Multifamily Term Loan	8	\$1.3	200
Multifamily Catalyst Loan	2	\$0.1	-
Strategic Investments	2	\$7.5	-
Total	1,718	\$99.2	24,000

Table 6. Revised FY 2021 Targets for the Financing Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Commercial PACE	33-48	\$15.2-\$23.3	5,300-7,100	1,452-1,641
Green Bank Solar PPA	30-58	\$4.0-\$6.8	6,200-15,400	3,400-9,668
Small Business Energy Advantage	1,203	\$20.4	-	-
Multifamily Predevelopment Loan	1	\$0.1	-	-
Multifamily Term Loan	2	\$0.2	0.1	68
Multifamily Health & Safety	1	\$0.1	-	-
EV Offset Program	-	-	-	17,770
Strategic Investments	3	\$7.8	-	-
Total	1,267-1,273	\$46.1-\$69.2	10,900-20,700	6,800-13,100

Table 7. Revised FY 2022 Targets for the Financing Programs Business Unit

Program / Product	Projects	Total Investment (\$MM's)	Installed Capacity (kW)	Ann. GHG Emissions Avoided (TCO2)
Commercial PACE	30	\$22.8	6,300	11,172
Green Bank Solar PPA	37	\$17.7	11,000	18,503
Small Business Energy Advantage	614	\$9.3	-	83,709
Multifamily Term Loan	2	\$0.3	200	282
Multifamily Health & Safety	1	\$0.6	-	-
EV Offset Program	-	-	-	16,500
Strategic Investments	-	-	-	-
Total	679	\$49.0	16,500	129,285

⁵⁰ In partnership with Eversource Energy and Amalgamated Bank, the Green Bank provides capital in support of the utility-administered SBEA program to provide 0% on-bill financing up to 4-years for energy efficiency projects.

Starting in FY 2021, the Green Bank has added annual GHG emissions avoided (see Tables 6 and 7) and investment in vulnerable communities (see bullet below) as targets for its Financing Programs.

- By 2025, no less than 40 percent of investment and benefits (e.g., jobs) from Financing Programs is directed to vulnerable communities.

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

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

6. Environmental Infrastructure Programs

The Green Bank is developing environmental infrastructure programs. That is to say that the Green Bank will utilize its financing tools, in close cooperation with the DEEP, to mobilize private investment in the modernization and decarbonization of environmental infrastructure, making it more resilient to the impacts of climate change. With the passage of PA 21-115, the scope of the Green Bank has broadened from “clean energy” to now include “environmental infrastructure”. As required by statute, the Green Bank must first develop a Comprehensive Plan in order to be able to expend resources to foster its growth, development, and commercialization. In FY 2022, the Green Bank will develop such plan.

The policy supports environmental infrastructure in the following ways:

- **Governance** – establishes an ex officio position on the BOD for the Secretary of the Office of Policy and Management (“OPM”) (or their designee);
- **Environmental Infrastructure Fund** (“EIF”) – establishes an EIF which may receive funds, including federal funds, that are available for environmental infrastructure investments;⁵¹
- **Bonding** – allows the Green Bank to issue bonds for up to 25 years for “clean energy” and 50 years for “environmental infrastructure” projects or the useful life of the measure, whichever is less;

⁵¹ Such funds shall not include ratepayer (e.g., CEF) or RGGI funds, or funds associated with the Clean Water Fund or such funds collected from a water company.

- **Special Capital Reserve Fund** (“SCRF”) – increases the Green Bank’s access to the SCRF from \$100 MM to \$250 MM;⁵² and
- **Reporting** – increases reporting to committees of cognizance within the Connecticut General Assembly from energy and commerce, to now include environment and banking.

For FY 2022, the Green Bank’s budget includes resources to support the development of a Comprehensive Plan, and hiring of a Director of Environmental Infrastructure Programs. To immediately support private investment in environmental infrastructure, the Green Bank will expand its Smart-E Loan Program with local community banks and credit unions to provide borrowers with the ability to finance environmental infrastructure projects (e.g., health & safety, wells for water, greenhouses) on their homes.⁵³ In FY 2023, after the completion, review, and approval of a Comprehensive Plan, the Green Bank will implement an environmental infrastructure program.

7. Impact Investment

The Green Bank pursues investment strategies that advance market transformation in green investing while supporting the organization’s pursuit of financial sustainability. With the mission to confront climate change and provide all of society a healthier and more prosperous future by increasing and accelerating the flow of private capital into markets that energize the green economy, the Green Bank leverages limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut.

7.1 State Funds

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

System Benefit Charge – CEF

As its primary source of public revenues, the Green Bank through CGS 16-245n(b) receives a 1 mill per kilowatt-hour surcharge called the CEF from ratepayers of Eversource Energy and Avangrid. The CEF has been in existence since Connecticut deregulated its electric industry in the late 1990s.⁵⁴ On average, households contribute between \$7-\$10 a year for the CEF, which the Green Bank leverages to attract multiples of private capital investment in the green economy of Connecticut through its Financing Programs.

Regional Greenhouse Gas Emission Allowance Proceeds

⁵² SCRF will only be allowed for up to 25 years for “clean energy” and “environmental infrastructure”

⁵³ Through a second loan loss reserve, the Green Bank currently provides local community banks and credit unions with a credit enhancement to provide low-cost and long-term unsecured loans for clean energy improvements to their homes.

⁵⁴ PA 98-28 “An Act Concerning Electric Restructuring”

⁵⁵ The Clean Energy Fund should not be mistaken with the Conservation Adjustment Mechanism (or the Conservation and Loan Management Fund), which is administered by the EDCs

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

7.2 Federal Funds

The Green Bank receives public capital through a number of past, current, and future sources⁵⁶ of federal funds as well that it leverages to scale-up and mobilize private capital investment in the green economy of Connecticut.

American Recovery and Reinvestment Act

Through the American Recovery and Reinvestment Act ("ARRA") the CCEF received \$20 million for its programs and initiatives. After nearly \$12 million of those funds were invested as grants, the Green Bank invested the remaining \$8.2 million in financing programs. With \$2.2 million of ARRA funds left,⁵⁷ the Green Bank invested over \$6 million of ARRA funds to attract and mobilize more than \$169 million of public and private investment in residential clean energy financing programs.

United States Department of Agriculture

The Green Bank has applied to the United States Department of Agriculture ("USDA") to seek access to low-cost and long-term federal loan funds for the deployment of clean energy in rural communities.⁵⁸ The USDA has vast lending authority under the Rural Electrification Act of 1936, which enables direct loans, project financing and loan guarantees to a variety of borrowers.

Clean Energy & Sustainability Accelerator

Modelled after the Green Bank, the Clean Energy & Sustainability Accelerator ("Accelerator") is a public policy introduced by Congress (i.e., funding levels between \$20B to \$100B) and included as part of the American Jobs Plan (i.e., funding level of \$27B) by President Biden to create a national independent 501(c)3 nonprofit green bank. With growing bipartisan support, the creation of an Accelerator would provide the Green Bank with access to federal resources to mobilize private investment in "clean energy" and "environmental infrastructure" projects.

7.3 Green Bonds

The future of green bonds is growing. Globally, in 2020, countries, companies, and local governments sold \$305.1 billion (2019: \$269.4 billion) of green bonds that fund projects that are good for the environment.⁵⁹ In July of 2019, Connecticut Treasurer Shawn Wooden announced that the Clean Water Fund's Green Bond Sale shattered state records. The AAA-rated green bond had a record low interest rate of 2.69% and received retail investor orders topping \$240

⁵⁶ There have been ongoing public policy proposals at the national level that the Connecticut Green Bank has been a part of to create a US Green Bank. If such a public policy were passed, then the Connecticut Green Bank would have access to significant federal funds to leverage to scale-up and mobilize private capital investment in the green economy of Connecticut.

⁵⁷ As of July 1, 2021

⁵⁸ "Rural" communities are defined by a population bound and the various limits depend on the program; at the broadest, "rural" may be considered a town that has a population not greater than 50,000 people. Despite its positioning in a mostly-developed corridor, we estimate Connecticut would have 69% of towns eligible at the 20,000-person limit and 89% of towns at the 50,000-person limit.

⁵⁹ Bloomberg News (James Crombie, January 8, 2021)

million in one day! This is the highest level of retail investor orders (i.e., from Separately Managed Accounts (“SMAs”) or individuals) in the 20-year history of this program – with the balance of the bonds offered to institutional investors generating an additional \$128 million in orders. In April 2019, the Green Bank issued \$38.6 million in green asset backed securities – its first rated debt issuance and the first ever solar asset-backed security (ABS) transaction by a green bank. The issuance was certified by Kestrel Verifiers and independently assessed by Climate Action Reserve. It was honored by Environmental Finance with the Innovation and Green Bond Structure awards in 2020. In July 2020, the Green Bank issued \$16.8 million in a SCRF backed Green Liberty Bond that was Climate Bond Certified. The Green Liberty Bond was recognized by The Bond Buyer with the Innovative Deal of the Year award in 2020. And in April 2021, the Green Bank sold out \$25 million in Green Liberty Bonds drawing four times as much demand as could be fulfilled from retail investors in Connecticut and across the U.S., as well as institutional investors interested in sustainability investments.

Green Banks have an essential role in leveraging limited public funds with private capital to drive investment in the green economy to achieve climate change goals, create jobs in our communities, and reduce the burden of energy costs on our families and businesses. CGS Section 16-245n(d)(1)(C) is the enabling statute that allows the Green Bank to issue revenue bonds for up to 25 years for clean energy and 50 years for environmental infrastructure projects to support its purposes. Green Bonds are bonds whose proceeds are used for projects or activities with environmental or climate benefits, most usually climate change mitigation and adaptation.

Connecticut’s climate change plan⁶⁰ focuses on three mitigation wedges (see Figure 4), including:

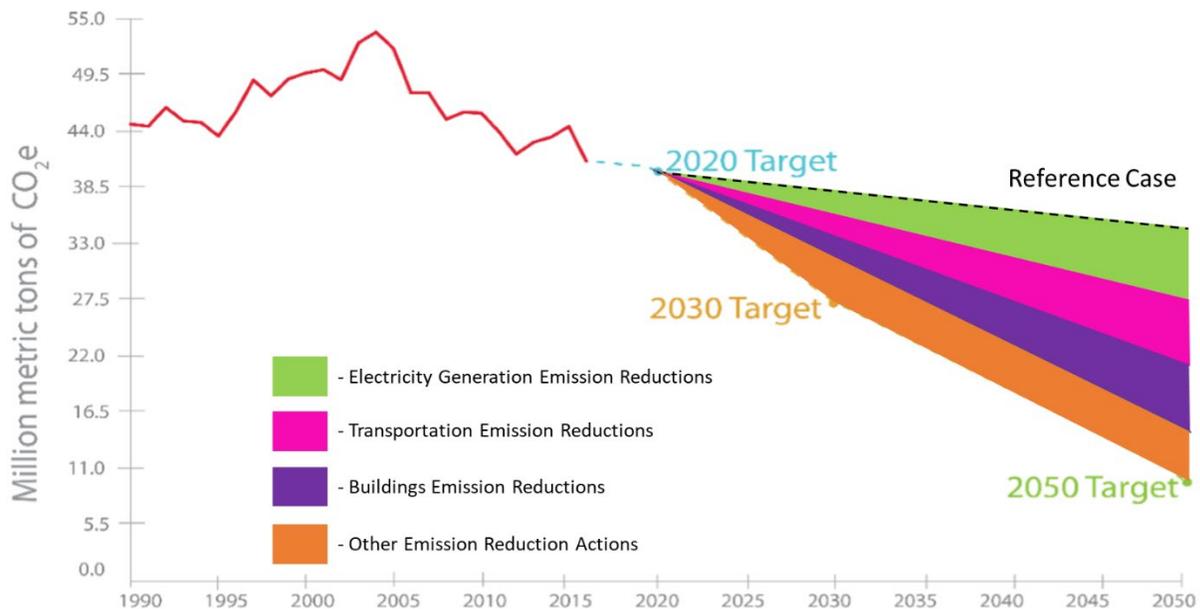
- **Decarbonizing Electricity Generation** – representing 23% of Connecticut’s economy-wide GHG emissions, electricity generation must be transitioned to zero-carbon renewable energy sources. Strategies include financing for in-state or regional utility-scale renewable energy resources (e.g., community solar, wind, run-of-the-river hydro, food-waste-to-energy, etc.) and financing and incentives for in-state distributed energy resources (e.g., behind the meter solar PV, battery storage, fuel cells, combined heat and power, etc.) that assist with the implementation of the Class I and III RPS, RGGI, and other public policies. To ensure a sustainable downward trajectory to meet the State’s 2050 target, electricity generation must be 66% and 84% carbon-free by 2030 and 2050, respectively.
- **Decarbonizing Transportation** – representing over 35% of Connecticut’s economy-wide GHG emissions, the transportation sector is the largest source of statewide emissions and must be transitioned to zero- and low-carbon technologies. Strategies for zero- and low-carbon transportation include adopting innovative financing models for zero emission vehicles (“ZEV”) deployment (i.e., EVs and fuel cell electric vehicles (“FCEVs”)) and ZEV charging infrastructure, ensuring equitable access to clean transportation options such as

⁶⁰ “Building a Low Carbon Future for Connecticut – Achieving a 45% GHG Reduction by 2030” recommendations from the Governor’s Council on Climate Change (December 18, 2018)

electric bus fleets and ride sharing or hailing services. Also important is supporting voluntary (e.g., carbon offset) and regulatory (e.g., Transportation Climate Initiative) markets for cleaner transportation that transitions us away from fossil fuel to renewable energy. More specifically, to meet the 2030 target, 20% of the passenger fleet and 30% of the heavy-duty fleet must be zero emission; and to meet the 2050 target, 95% of the passenger fleet and 80% of the heavy-duty fleet must be zero emission.

- **Decarbonizing Buildings** – representing over 30% of Connecticut’s economy-wide GHG emissions, residential, commercial, and industrial buildings are the second largest emitting sector that must transition away from fossil fuels to renewable thermal technology. Strategies for zero-carbon buildings include financing and incentives for energy efficiency (e.g., thermal insulation, appliances, etc.) and renewable heating and cooling (e.g., air source heat pumps, ground source heat pumps, heat pump water heaters, etc.). To meet the economy-wide 2030 and 2050 targets for Buildings, renewable heating and cooling technologies must be significantly deployed to 11% and 26% for residential, and 9% and 20% for commercial, by 2030 and 2050 respectively.

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



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

8. Citizen Engagement

The Green Bank, and its predecessor the CCEF, have a long-standing history of citizen engagement within the communities of Connecticut. In 2002, the CCEF partnered with six private foundations⁶¹ to co-found SmartPower – which launched the 20 percent by 2010 campaign and led the administration of the CCEF’s EPA award-winning Connecticut Clean Energy Communities Program.⁶² Then in 2013, the Green Bank launched a series of Solarize campaigns in communities across the state in partnership with SmartPower and the Yale Center for Business and the Environment,⁶³ while also advancing the SunShot Initiative of the U.S. Department of Energy (“USDOE”) in partnership with the Clean Energy States Alliance through projects that reduce soft-costs for solar PV (i.e., customer acquisition, permitting, and financing) and provide better access to solar PV for LMI households.

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

7.1 Green Bonds US

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

Whether through markets or within communities, the Green Bank is bringing people together and strengthening the bonds we share with one another. As the name of the Comprehensive Plan suggests – “Green Bonds US” seeks to promote a simple but critically important message; green brings us together, green bonds us, the environment unites us. The simple slogan combines the financial tool of green bonds that are being sold to retail investors across the United States with a unifying message that humanity and the environment are inextricably linked.

Green Liberty Bonds

Despite the rising demand for clean energy in the state, barriers still exist that may prevent more people from participating in Connecticut’s growing green economy. For example, a homeowner who, despite having a strong desire to “go solar”, is not able to because of factors like price, siting, or other issues. To allow more people to benefit from, and invest in, clean energy and environmental infrastructure, the Green Bank is offering another way. For the first time in its history, the Green Bank has issued “mini” green-bonds (e.g., small denomination bonds, certificate of deposits, and/or other fixed income investments) called Green Liberty Bonds, for sale to institutions and retail investors (i.e., SMAs and individuals). Green Liberty Bonds have three features:

⁶¹ Emily Hall Tremain Foundation, The John Merck Fund, Pew Charitable Trust, The Oak Foundation, Rockefeller Brothers Fund, and Surdna Foundation

⁶² “Climate Policy and Voluntary Initiatives: An Evaluation of the Connecticut Clean Energy Communities Program,” by Matthew Kotchen for the National Bureau of Economic Research (Working Paper 16117).

⁶³ “Solarize Your Community: An Evidence-Based Guide for Accelerating the Adoption of Residential Solar” by the Yale Center for Business and the Environment.

1. **Use of Proceeds** – funds raised from the bonds must go towards projects that support the Paris Agreement (i.e., mitigation of GHG emissions or adaptation to the impacts of climate change);
2. **Retail Accessible** – like the Series-E War Bonds of the 1940’s, bonds must be small denomination (i.e., less than \$1,000) and available to everyday retail investors; and
3. **Independently Certified and Verified** – due to the expectation by retail investors that the use of proceeds will go towards projects that support the Paris Agreement, the bonds must be independently certified and verified as green.

With these three features within a bond, any green bond can be a Green Liberty Bond.

In March and December of 2020, the Green Bank’s bonds were awarded for innovation and green bond structure by Environmental Finance and The Bond Buyer, respectively.

For more information on Green Liberty Bonds, visit www.greenlibertybonds.com

Market Research

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

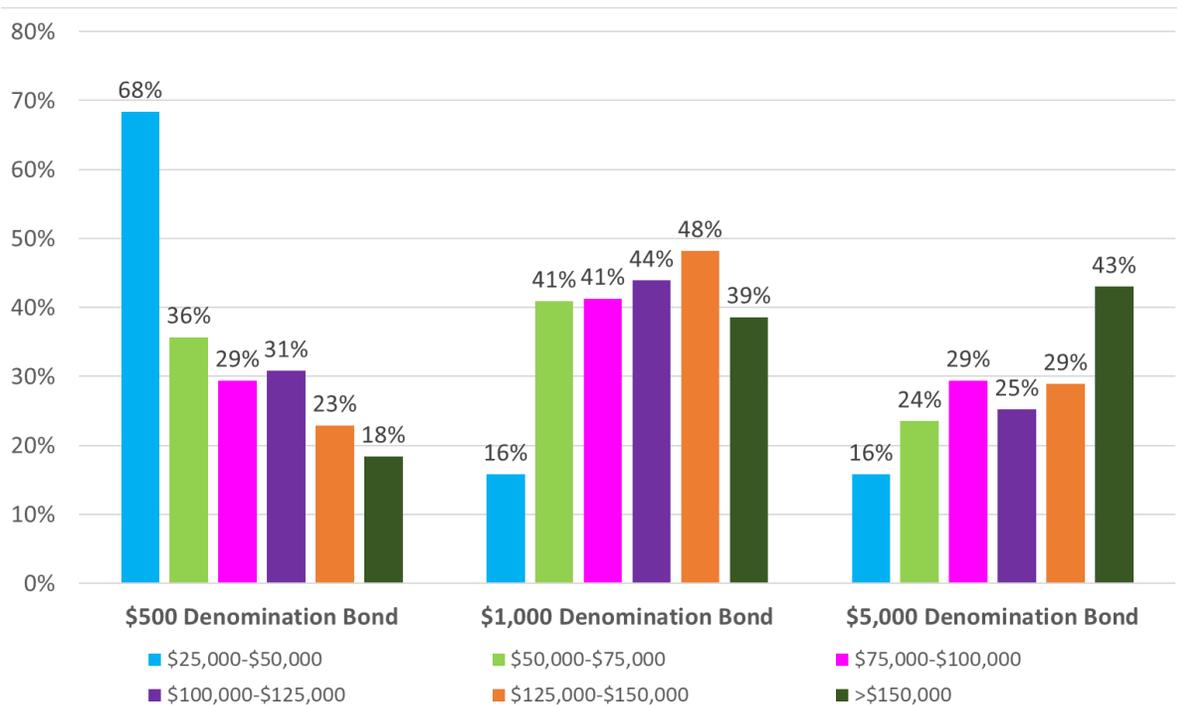
In June of 2019, the Green Bank engaged GreatBlue Research to conduct primary research throughout Connecticut, measuring the market potential for “mini-bonds”. A digital survey was sent to two target audiences: 1.) households that have installed solar PV through the RSIP and 2.) the general population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

- Recycling and waste reduction – 69.5%
- Clean water – 67.3%
- Roof-top solar – 64.5%
- High efficiency heating and cooling systems – 58.8%
- Home energy efficiency projects – 56.7%
- Land conservation – 49.3%
- Energy efficiency appliance rebates – 45.6%
- Electric vehicles (“EV’s) – 41.2%

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

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

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



The Green Bank expects to continue to conduct survey research on retail green bond investors from Connecticut and across the country to assess their interest in investing in “clean energy” and “environmental infrastructure” projects.

7.2 Sustainable CT

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

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

- Creating a measurable impact, both qualitative and quantitative.

Through a partnership between Sustainable CT and Patronicity, an online crowdfunding platform will enable citizen leaders to have access to financial resources (i.e., grants) that they need to support local sustainability projects.

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

9. Evaluation Framework and Impact Methodologies

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

9.1 Evaluation Framework

The Green Bank has established an Evaluation Framework to guide the assessment, monitoring and reporting of the program impacts and processes, including, but not limited to energy savings and clean energy production and the resulting societal impacts or benefits arising from clean energy investment.⁶⁴ This framework focuses primarily on assessing the market transformation the Green Bank is enabling, including:

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

With the goal of pursuing investment strategies that advance market transformation in green investing, the Green Bank’s evaluation framework provides the foundation for determining the impact it is supporting in Connecticut and beyond across the four (4) “E’s” (i.e., E⁴) – including Economy, Environment, Energy, and Equity.

9.2 Green Bond Framework

The Green Bank’s Green Bond Framework (“Framework”)⁶⁵ provides a structure in which the Green Bank can more efficiently and effectively support its efforts to raise capital and deploy more clean energy and environmental infrastructure through the issuance of green bonds.

⁶⁴ <https://ctgreenbank.com/wp-content/uploads/2017/02/CTGreenBank-Evaluation-Framework-July-2016.pdf>

⁶⁵ https://ctgreenbank.com/wp-content/uploads/2020/04/CGB_Green-Bond-Framework_final-4-22-2020.pdf

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

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

9.3 Impact Methodologies

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

- **Jobs** – working in consultation with the Connecticut Department of Economic and Community Development (“DECD”), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the direct, indirect, and induced job-years resulting from clean energy deployment.⁶⁶
- **Tax Revenues** – working in consultation with the Connecticut Department of Revenue Services (“DRS”), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the individual income, corporate, and sales tax revenues from clean energy deployment.⁶⁷
- **Environmental Protection** – working in consultation with the United States Environmental Protection Agency (“USEPA”) and DEEP, the Green Bank devised a methodology that takes the reduction in consumption of energy and increase in the production of clean energy to reasonably estimate the air emission reductions (i.e., CO₂, NO_x, SO₂, and PM_{2.5}) resulting from clean energy deployment.⁶⁸
- **Public Health Improvement** – working in consultation with the EPA, DEEP, and the Connecticut Department of Public Health (“DPH”), the Green Bank devised a methodology that takes air emission reductions to reasonably estimate the public health

⁶⁶ https://www.ctgreenbank.com/wp-content/uploads/2018/03/CGB_DECD_Jobs-Study_Fact-Sheet.pdf

⁶⁷ <https://www.ctgreenbank.com/wp-content/uploads/2018/09/CGB-Eval-Tax-Methodology-7-24-18.pdf>

⁶⁸ <https://www.ctgreenbank.com/wp-content/uploads/2018/01/CGB-Eval-IMPACT-091917-Bv2.pdf>

benefits (e.g., reduced hospitalizations, reduced sick days, etc.) and associated savings to society resulting from clean energy deployment.⁶⁹

- **Equity** – with the passage of PA 20-05, the Green Bank devised a methodology that takes the definition of “vulnerable communities” to track progress towards the goal of ensuring that no less than 40 percent of investment from its programs are directed to vulnerable communities by 2025.
- **Energy Burden** – working in consultation with DEEP and PURA, the Green Bank devised a methodology that takes actual solar PV production data from meters compared against contractual lease and PPA prices, to estimate the energy burden reduction from financing solar PV.

Each year, the Green Bank develops additional methodologies that value the impact the Green Bank is helping create in Connecticut and all of society. For more information on the Green Bank’s impact methodologies, visit the Impact page of the website.⁷⁰ In FY 2023, the Green Bank will revise its methodologies beyond “clean energy” to also include “environmental infrastructure” projects and their associated benefits.

The Green Bank’s efforts to increase investment in and deployment of clean energy and environmental infrastructure projects – which result in increased benefits to Connecticut and all of society – can also be looked at through the lens of the United Nation’s Sustainable Development Goals (“UNSDG’s”).⁷¹ The UNSDG’s include, but are not limited to – reducing poverty, improving health and well-being, making clean energy affordable, increasing economic development, reducing inequalities, supporting sustainable communities, and confronting climate change – areas where the Green Bank is measuring (or will measure) the impacts of its investments.

10. Reporting and Transparency

The Green Bank has extensive reporting on its financial management and societal impact through various mechanisms. As a recipient of public revenues (i.e., CEF and RGGI allowance proceeds), the Green Bank believes that complete transparency is important to ensure the public’s continued trust in serving its purpose. The Green Bank reports to the Governor’s Office (i.e., OPM), various committees of cognizance within the Connecticut General Assembly (i.e., energy & technology, commerce, environment, and banking), and other departments (e.g., DEEP, Office of Fiscal Analysis)

10.1 Comprehensive Annual Financial Report (“CAFR”)

A Comprehensive Annual Financial Report (“CAFR”) is a set of government financing statements that includes the financial report of a state, municipal or other government entity that complies with the accounting requirements promulgated by the Governmental Accounting Standards Board (“GASB”). GASB provides standards for the content of a CAFR in its annually updated publication *Codification of Governmental Accounting and Financial Reporting Standards*. A

⁶⁹ <https://www.ctgreenbank.com/wp-content/uploads/2018/03/CGB-Eval-PUBLICHEALTH-1-25-18-new.pdf>

⁷⁰ <http://www.ctgreenbank.com/strategy-impact/impact/>

⁷¹ <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

CAFR is compiled by a public agency's accounting staff and audited by an external American Institute of Certified Public Accountants ("AICPA") certified accounting firm utilizing GASB requirements. It is composed of three sections – Introductory, Financial, and Statistical. The independent audit of the CAFR is not intended to include an assessment of the financial health of participating governments, but rather to ensure that users of their financial statements have the information they need to make those assessments themselves.⁷²

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

- [Fiscal Year Ended June 30, 2014 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2015 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2016 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2017 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2018 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2019 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2020 \(Certificate of Achievement\)](#)
- [Fiscal Year Ended June 30, 2021](#)

As the "gold standard" in government reporting, the CAFR is the mechanism the Green Bank uses to report its fiscal year financial and investment performance – including societal benefits and impacts – to its stakeholders. For each of its seven years filing the CAFR with the Government Finance Officers Association the Green Bank has received a Certificate of Achievement for Excellence in Financial Reporting.⁷³

10.2 Annual Report

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

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

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

⁷² The Government Finance Officers Association (GFOA), founded in 1906, represents public finance officials throughout the United States and Canada. GFOA's mission is to enhance and promote the professional management of governmental financial resources by identifying, developing, and advancing fiscal strategies, policies, and practices for the public benefit. GFOA established the Certificate of Achievement for Excellent in Financial Reporting Program (CAFR Program) in 1945 to encourage and assist state and local governments to go beyond the minimum requirements of generally accepted accounting principles to prepare CAFRs that evidence the spirit of transparency and full disclosure and then to recognize individual governments that succeed in achieving that goal.

⁷³ GAO has yet to designate the FY 2020 CAFR with a Certificate of Achievement

- [Fiscal Year 2019 Annual Report](#)
- [Fiscal Year 2020 Annual Report](#)
- [Fiscal Year 2021 Annual Report](#)

10.3 Auditors of Public Accounts

The office of the Auditors of Public Accounts (“APA”) is a legislative agency of the State of Connecticut whose primary mission is to conduct audits of all state agencies, including quasi-public agencies. Included in such audits is an annual Statewide Single Audit of the State of Connecticut to meet federal requirements. The office is under the direction of two state auditors appointed by the state legislature. The APA audited certain operations of the Green Bank in fulfillment of its duties under Sections 1-122 and Section 2-90 of the CGS

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

- [Fiscal Years 2012 and 2013](#)
- [Fiscal Years 2014 and 2015](#)
- [Fiscal Years 2016 and 2017](#)
- [Fiscal Years 2018 and 2019](#)

10.4 Open Connecticut and Open Quasi

Open Connecticut centralizes state financial information to make it easier to follow state dollars. In Connecticut quasi-public agencies are required to submit annual reports to the legislature, including a summary of their activities and financial information. In addition to that, the Comptroller’s office requested that quasi-public agencies voluntarily provide payroll and checkbook-level vendor payment data for display on Open Connecticut. The Green Bank, which was among the first quasi-public organizations to participate, has voluntarily submitted this information since the inception of Open Connecticut.⁷⁴ In June of 2020, the Comptroller launched Open Quasi, which provides payroll and checkbook level data for all quasi-public organizations in Connecticut.

For more information, go to <http://www.openquasi.ct.gov/>

10.5 Stakeholder Communications

The Green Bank holds quarterly stakeholder webinars to update the general public on the progress it is making with respect to its Comprehensive Plan and annual targets.⁷⁵ Through these webinars, the Green Bank staff invite questions from the audience. These webinars are announced through the Green Bank’s list serve consisting of thousands of stakeholders as well as the events page of its website.⁷⁶

⁷⁴ <https://openquasi.ct.gov/>

⁷⁵ <https://www.ctgreenbank.com/news-events/webinars/>

⁷⁶ <https://www.ctgreenbank.com/news-events/events-calendar/>

The Green Bank also issues an e-newsletter through its list serve that provides key topics in the news and important information on products, programs and services.⁷⁷

11. Research and Product Development

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

- **Shared Clean Energy Facilities** – to support decarbonizing the electricity infrastructure climate change wedge, while reducing the burden of energy costs on Connecticut's families and businesses, the Green Bank will seek to apply its experience administering the RSIP to supporting and investing in shared clean energy facilities (or community solar projects) with a focus on LMI families;
- **Energy Burden from Transportation** – as Operation Fuel has done an exceptional job quantifying the energy burden for electricity use and heating of homes, understanding the energy burden from transportation (i.e., gasoline to alternative fuel vehicles) will help the Green Bank and others (e.g., Department of Housing, Connecticut Housing and Finance Authority, Partnership for Strong Communities, DEEP, etc.) understand its role in addressing the decarbonization of transportation emissions climate change wedge;
- **Environmental Infrastructure** –the Green Bank could apply the green bank model to mobilize private investment in “environmental infrastructure”.⁷⁸ Working with DEEP and other state agencies, local governments, nonprofit organizations, academic institutions, and businesses, the Green Bank could, for example, identify new areas for increased investment in climate change adaptation and resiliency through the issuance of green bonds;⁷⁹ and
- **Metering** – to better understand the performance of various technologies, the Green Bank might support the deployment of meters. For example, meters for ground source heat pumps are being provided for free for the first 50 customers that finance such systems using the Smart-E Loan. Performance data collected from the meters and analyzed from such systems, over time, will inform installation, servicing, and financing of such systems supporting their wider adoption.

⁷⁷ <https://www.ctgreenbank.com/newsletters/>

⁷⁸ Proposed Senate Bill 927 in the 2019 Legislative Session

⁷⁹ Section 10.3 Sustainability of the Comprehensive Plan of the Connecticut Green Bank for FY 2017 through FY 2019 recognizes that other green banks invest beyond “clean energy” and include “environmental infrastructure”.

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

12. Budget

12.1 FY 2020 Budget

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

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

12.2 FY 2021 Budget

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

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

12.3 FY 2022 Budget

For the details on the FY 2022 budget– [click here](#).

For details on the FY 2022 revised budget – [click here](#).

13. Glossary of Acronyms

ABS	Asset-Backed Security
ACG Committee	Audit, Compliance, and Governance Committee
AICPA	American Institute of Certified Public Accountants
APA	Auditors of Public Accounts
ARRA	American Recovery and Reinvestment Act
BOC Committee	Budget, Operations, and Compensation Committee
BOD	Board of Directors
CAFR	Comprehensive Annual Financial Report
CBI	Climate Bonds Initiative
CCEF	Connecticut Clean Energy Fund
CDFI	Community Development Financial Institution
CEF	Clean Energy Fund
CGS	Connecticut General Statutes
C-PACE	Commercial Property Assessed Clean Energy
DECD	Department of Economic and Community Development
DEEP	Department of Energy and Environmental Protection
DPH	Department of Public Health
DRS	Department of Revenue Services
EDC	Electric Distribution Company
EEB	Energy Efficiency Board
EEPP	Electric Efficiency Partners Program
EIF	Environmental Infrastructure Fund
EV	Electric Vehicle
GASB	Governmental Accounting Standards Board
GHG	Greenhouse Gas Emissions
HES	Home Energy Solutions
HES-IE	Home Energy Solutions – Income Eligible
IPC	Inclusive Prosperity Capital
LMI	Low-to-Moderate Income
MPA	Master Purchase Agreement
MTI	Master Trust Indenture
OPM	Office of Policy and Management
PA	Public Act
PPA	Power Purchase Agreement
PURA	Public Utilities Regulatory Authority
REC	Renewable Energy Credit
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standard
RSIP	Residential Solar Investment Program
RSIP-E	Residential Solar Investment Program – Extension
SBEA	Small Business Energy Advantage
SCRF	Special Capital Reserve Fund
SHREC	Solar Home Renewable Energy Credit
SMA	Separately Managed Accounts

UNSDG	United Nations Sustainable Development Goals
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USEPA	United States Environmental Protection Agency
ZEV	Zero Emission Vehicle



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