



Envirothon Session

Evaluating the Benefits and Risks of Climate Change Projects

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January 17, 2023



Climate Change through the Green Bank Lens

What is a Green Bank?



- A green bank accelerates the green economy using **limited public dollars to attract multiples of private capital investment.**
- In doing so, clean energy and environmental solutions are more affordable and accessible to consumers.





Connecticut Green Bank is the nation's first green bank. Established in 2011 as a quasi-public agency, the Green Bank uses limited public dollars to attract private capital investment and offers green solutions that help people, businesses and all of Connecticut thrive.

Our mission is to confront climate change by increasing and accelerating investment into Connecticut's green economy to create more resilient, healthier, and equitable communities

**Guiding this mission is our vision for
“...a planet protected by the love of humanity.”**

About Us



Quasi-public organization – broad enabling statute and powers set forth in Conn. General Statute 16-245n



Focus – Finance clean energy (e.g., renewable energy, energy efficiency, and alternative fuel vehicles and infrastructure) and environmental infrastructure (e.g., land conservation, parks and recreation, carbon offsets, ecosystem services, water) by leveraging public capital with multiples of private capital



Support – from a variety of sources, including:

State Support – \$0.001/kWh surcharge (i.e., Clean Energy Fund) on electric ratepayer bills (about \$7-\$10 per household per year \approx \$25 MM per year) and RGGI allowance proceeds about \$5 MM per year (renewable energy)

Federal Support – competitive solicitations (e.g., SunShot), non-competitive resources (e.g., ARRA-SEP, USDA, etc.), and maybe a National Climate Bank

Other Support – issue “green bonds,” interest income, private capital (e.g., impact investors), and foundations (e.g., PRI’s)

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



To leverage limited public resources to scale-up and mobilize private capital investment in the green economy of Connecticut



To strengthen Connecticut's communities, especially vulnerable communities, by making the benefits of the green economy inclusive and accessible to all individuals, families, and businesses



To pursue investment strategies that advance market transformation in green investing while supporting the organization's pursuit of financial sustainability





We are increasing and accelerating investment into the green economy to:



Create more jobs in our communities



Reduce the burden of energy costs on our families and businesses (especially the most vulnerable)



Reduce fossil fuel pollution that causes local public health problems and global climate change



Make our communities more resilient to the impacts of climate change.



The Green Bank is helping Connecticut flourish by offering green solutions for homes and buildings and by creating innovative ways to invest in the green energy economy.

home solutions

Empowering all Connecticut families and households with accessible and affordable green solutions that bring them comfort and security. Find incentives for battery storage or use the Green Bank's flexible financing to reduce costs with health and safety improvements and the newest energy efficient technologies.



building solutions

Creating stronger, more resilient buildings with green solutions for all types of buildings – from businesses and nonprofits to multifamily housing. Leverage Green Bank financing to go solar or retrofit your building with efficiency and resiliency measures, while saving money and realizing the benefits of more modern, sustainable buildings.



our solutions

investment solutions

Securing a healthier planet with smart ways for individuals and businesses to invest in green solutions – and our future – while also earning a return. Energize the green economy by investing in it today. Buy a Green Liberty Bond, invest through a crowdfunding offering, or join the movement by finding other ways to invest.



community solutions

Helping Connecticut thrive and creating stronger towns and cities by offering green solutions for all. From solutions for local and state government properties, to providing support for community leaders in outreach to local businesses and community members – especially the most vulnerable – helping them to access green energy and achieve a more prosperous future.



How Policy Supports Climate Investment

Policy



The Green Bank establishes programs with the goal of delivering on the public policy objectives, while at the same time ensuring that funds invested are cost recoverable and encourage future investment that benefits the entire state.



Policy examples



1. **Inflation Reduction Act** New policy, IRA, will lead to new goals that drive investment towards achieving them (i.e. workforce development credits)
2. **Nitrogen Reduction Policy** leads to pay for performance investment – example Chesapeake Bay restoration projects. [The Chesapeake Bay Foundation](#) and the City of Hampton, VA to design and issue a \$12M Environmental Impact Bond (EIB) to finance the construction of three nature-based projects that will help slow, store, filter, and redirect stormwater in low- to moderate-income communities.
3. **21% by 2023 Goal** – to continue to increase the role land conservation has on mitigating GHG emissions and making Connecticut more resilient to the impacts of climate change, the state's goal to conserve 21% by 2023. Supporting the “no net loss of forest” goal and related goals such as increasing urban tree canopy are also important.

Designing a Good Project

Project Evaluation



1. Think about all the ways that a project will create impact (both good and bad things!). Some examples:
 - **Financial** How much will it cost? How much money will it save?
 - **Economic** Will it create jobs? Will it generate tax revenue?
 - **Health** Will it make people healthier? Will it make plants and animals healthier?
 - **Resilience** Will this help in the event of a storm? Other climate crises?
2. Think about which populations the project will impact and when
3. Compare the costs and benefits and decide if you think it's worth it to move forward or if there is a need for more research

Example: Adding Solar to Town Hall



Financial:

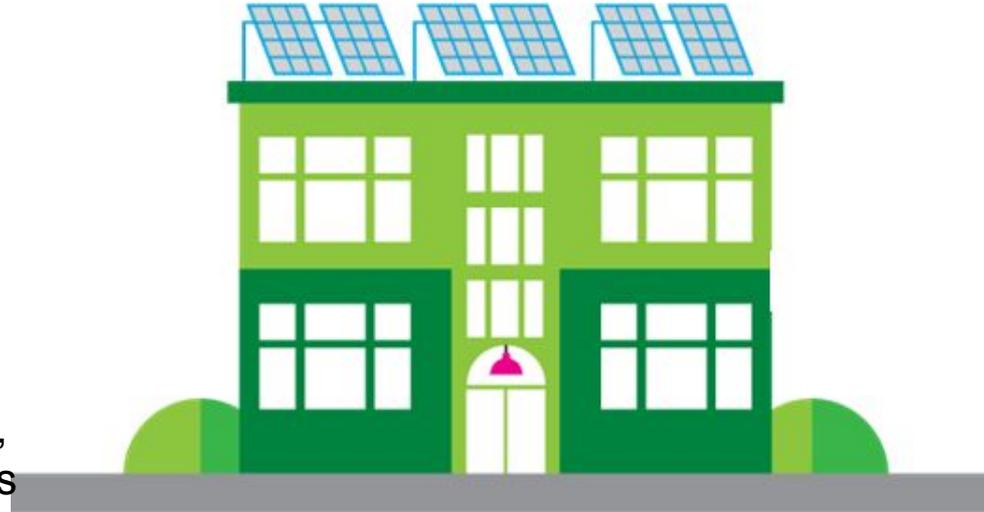
- Cost of system + installation + maintenance
- Save money on utility bills
- Federal Investment Tax Credit

Economic:

- Will generate work for installation contractor

Health:

- Will produce local, carbon-free power, reducing potentially harmful emissions from fossil-fueled power plants



Assessing Value

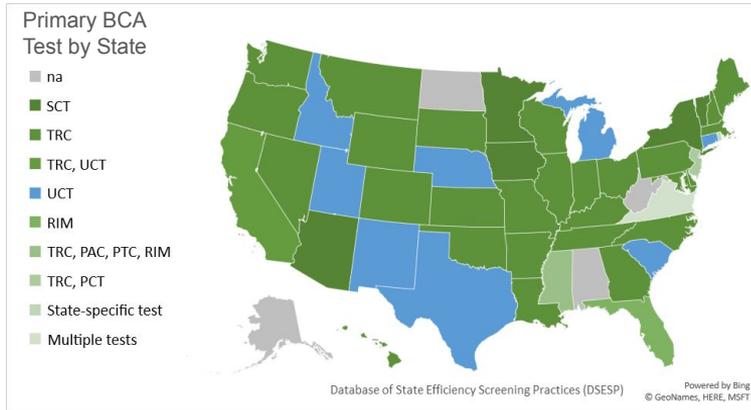


294kWDC Solar System	2023	2024	2025	2026	2027
Cost of System + Installation	(\$1,087,841)				
Investment Tax Credit	\$187,050				
Expected Annual Solar Generation (kWh)	293,000	291,535	290,077	288,627	287,184
Expected Annual Tariff Revenue	\$58,884	\$58,591	\$58,297	\$58,005	\$57,715
Savings to Investment Ratio	1.205				

Assessing Costs & Benefits



Several tools exist to support the evaluation of projects, each answers a different question



Source: NESP, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, August 2020

	Program Administrator Cost Test¹	<i>Are program administrators better off?</i>
	Participant Cost Test	<i>Are participants better off?</i>
	Societal Cost Test	<i>Is the state of Connecticut better off?</i>
	Total Resource Cost	<i>Is this a positive cash investment?</i>
	Rate Impact Measure	<i>Is this likely to reduce costs to electric ratepayers?</i>

¹ AKA Utility Cost Test, for programs administered solely by utilities. This analysis considers the PACT for three perspectives: the passive dispatch portion of the Program, the active dispatch portion of the Program, and the combined active + dispatch Program.

How do you quantify something unknown?



Valuing Environmental Infrastructure



As a group, let's consider what aspects of each of these topics has a market value. Can you identify areas of value in these things? And who is it valuable for?

Open space

Flood management

Locally grown food

Reduced stormwater

Prioritizing Projects



Remember: When you're talking to a public official, they have *limited funds*. You need to help them understand how to evaluate a project compared to other good projects that also need funding!

Suggestions:

- Look at their mission, how does this project support their goals?
- What potential funding sources are available that could help make this less expensive?
- How does this support local, state, or federal policy?

Identifying Who a Project Impacts

Project Benefits



Who benefits from a potential project?

Who bears the cost of climate change and the burdens of its impact?

How can project designs account benefits and harms (risks) across society?



“WHEN YOU HEAR PRESIDENT BIDEN SAY HE WANTS TO BUILD A BETTER AMERICA... HE MEANS A MORE EQUITABLE AMERICA. A MORE INCLUSIVE AMERICA. A MORE JUST AMERICA. AND WE’LL BUILD IT WITH CLEAN ENERGY.”

U.S. DEPARTMENT OF ENERGY SECRETARY JENNIFER GRANHOLM

[Read Secretary Granholm’s Letter to Justice40 Stakeholders](#)

What is Justice40?

During his first week in office, President Joe Biden issued [Executive Order 14008, Tackling the Climate Crisis at Home and Abroad](#). Section 223 of EO 14008 established the Justice40 Initiative, which directs 40% of the overall benefits of certain Federal investments – including investments in clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of clean water infrastructure – to flow to disadvantaged communities (DACs).

Community Benefit Agreements



Are a contract with community representatives and industry developers that details the types of benefits the community wants from a future project. Benefits can include jobs, siting, environmental impact, etc.

These types of agreements seek to uplift community needs and perspectives, and development.



How Climate Projects Drive Real Change

Connecticut Green Bank

Impact Investment – Economic & Energy



ECONOMIC DEVELOPMENT

JOBS The Green Bank has supported the creation of more than **26,720** direct, indirect, and induced job-years.



TAX REVENUES

The Green Bank's activities have helped generate an estimated **\$113.6** million in state tax revenues.



\$55.3 million
individual income tax

\$29.2 million
corporate taxes

\$29.1 million
sales taxes

ENERGY

ENERGY BURDEN

The Green Bank has reduced the energy costs on families, businesses, and our communities.



DEPLOYMENT

The Green Bank has accelerated the growth of renewable energy to more than **509 MW** and lifetime savings of over **65.6 million MMBTUs** through energy efficiency projects.



Connecticut Green Bank

Impact Investment – Environment & Equity



ENVIRONMENTAL PROTECTION

POLLUTION The Green Bank has helped reduce air emissions that cause climate change and worsen public health, including **9.6 million pounds** of SO_x and **11.1 million pounds** of NO_x lifetime.



10.4 MILLION
tons of CO₂ : >
EQUALS



156 MILLION
tree seedlings
grown for 10 years

OR



2.1 MILLION
passenger vehicles
driven for one year

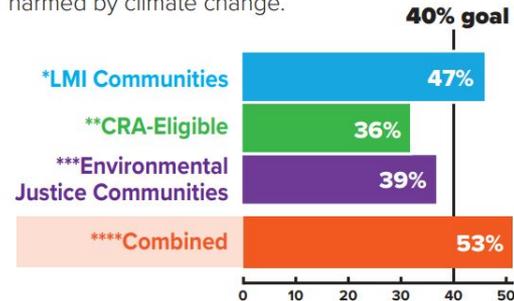
PUBLIC HEALTH The Green Bank has improved the lives of families, helping them avoid sick days, hospital visits, and even death.



\$317.1 – \$717.2 million of lifetime public health value created

EQUITY

INVESTING in vulnerable communities, The Green Bank has set **goals** to reach **40% investment** in communities that may be disproportionately harmed by climate change.



*LMI Communities – census tracts where households are at or below 100% Area Median Income.

**Community Reinvestment Act (CRA) Eligible – households at or below 80% of Area Median Income and all projects in programs designed to assist LMI customers.

***Environmental Justice Community means a municipality that has been designated as distressed by Connecticut Department of Economic and Community Development (DECD) or a census block group for which 30% or more of the population have an income below 200% of the federal poverty level.

****Combined Vulnerable Communities include LMI, CRA and EJC.



Thank You

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Appendix

Helpful References



- Connecticut Green Bank Environmental Infrastructure [Primers](#):
 - [Agriculture](#)
 - [Land Conservation](#)
 - [Parks and Recreation](#)
- [National Standards Practice Manual](#) (for Cost-Benefit Assessments)
- Connecticut Green Bank [Savings to Investment Ratio Calculator](#)