CONNECTICUT
GREEN BANK

Connecticut Green Bank

Public-Private Partnerships for Clean Energy

July 22, 2016

Agenda

- **What is the Connecticut Green Bank** – why were we established and who are we
- **What are Programs and Products of the Connecticut Green Bank** – how do we structure programs and products to attract private investment and deploy green energy
- **What Impacts are being Achieved through the Connecticut Green Bank** – what societal benefits are being created through green energy deployment and what's next

What is the Connecticut Green Bank?

Connecticut Green Bank

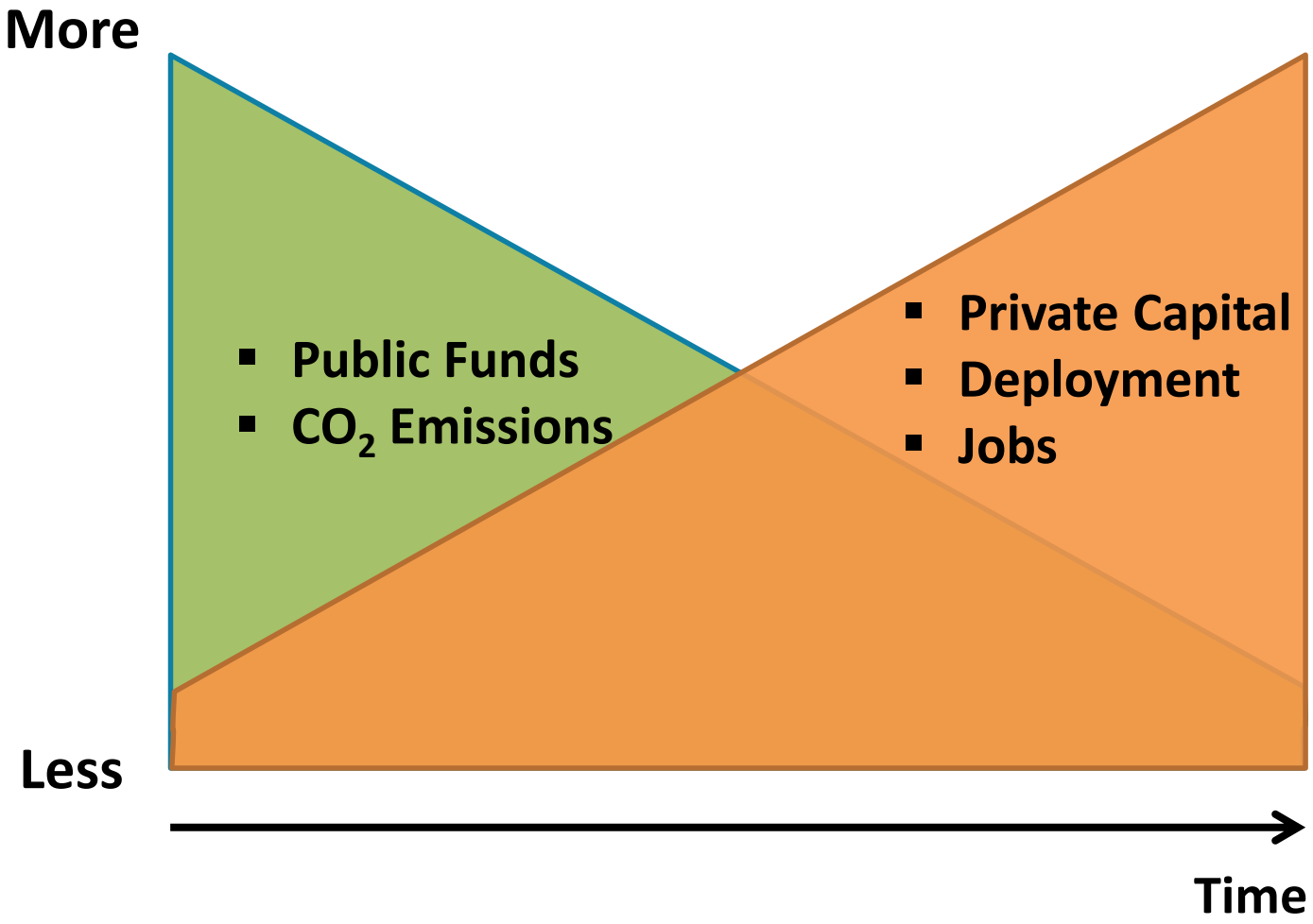
1st State-Level Green Bank in the United States

…***transitioning programs away from government-funded grants, rebates, and other subsidies, and towards deploying private capital***

…the Green Bank was established in 2011 to develop programs that will ***leverage private sector capital to create long-term, sustainable financing for energy efficiency and clean energy to support residential, commercial, and industrial sector implementation of energy efficiency and clean energy measures.***

Green Bank Model

Public-Private Partnerships



What are Programs and Products of the Connecticut Green Bank?

What are Green Bank Products and Programs

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Incentives

Green Bank Capital

↓

Project

gosolarCT
SPARKED BY CONNECTICUT GREEN BANK

solarize connecticut
SPARKED BY CONNECTICUT GREEN BANK

Co-Investment

Green Bank Capital

↕

Project

↕

Private Capital

gosolarCT
SPARKED BY CONNECTICUT GREEN BANK

Credit Support

Senior Private Capital

Green Bank Credit Enhancement

↕

Project

smart-e loan
SPARKED BY CONNECTICUT GREEN BANK

Warehousing

Project

↕

Green Bank Origination

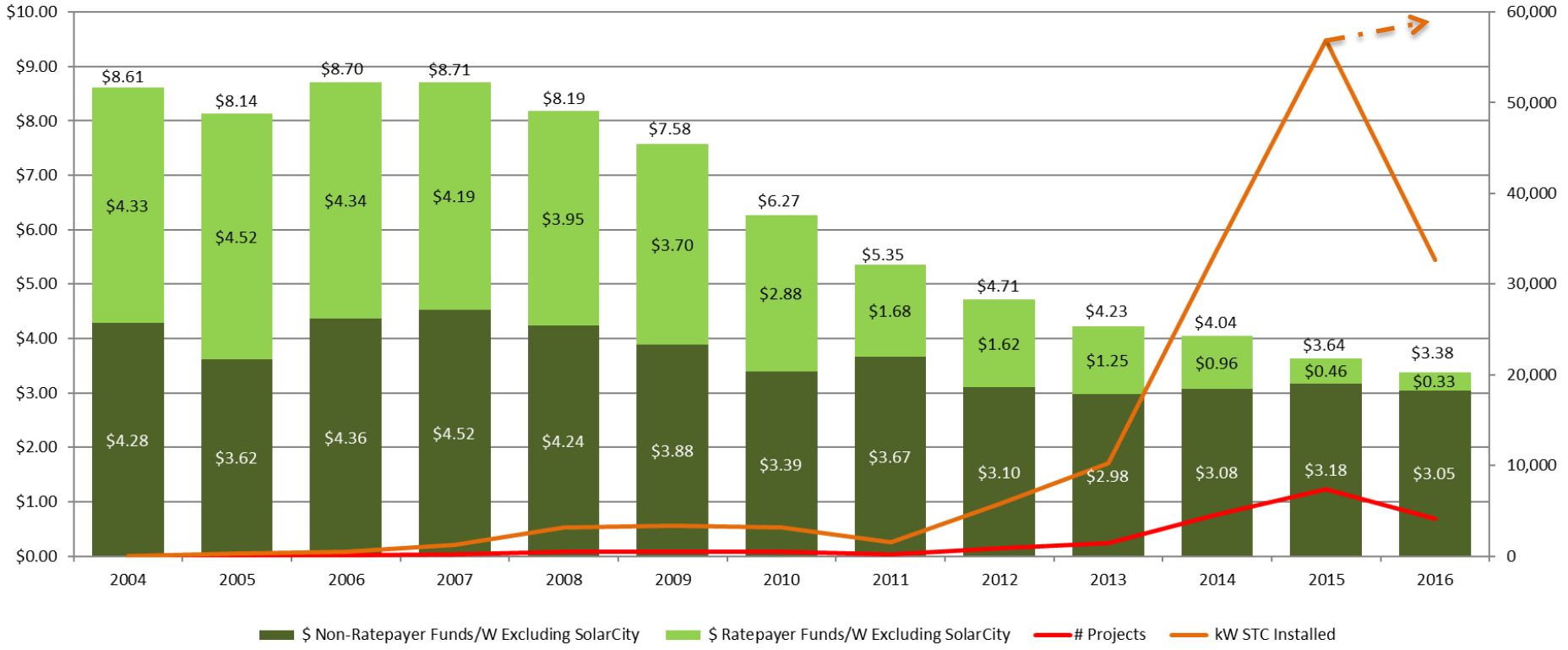
↑

Private Purchase of Portfolio

cpace
SPARKED BY CONNECTICUT GREEN BANK

RSIP (Incentives)
Residential Solar PV in Connecticut

Project volume has **more than doubled** each of the past four years, while incentives and installed costs **have decreased by 80% and over 35%** respectively since 2011.



Nearly **$600 million invested** through **$90 million in incentives** deploying **nearly 140 MW** since 2012

REFERENCES

Market Watch Report data as of July 15, 2016

Total System Cost per Watt figures include all reported installed costs without including those projects where financing costs for some third party ownership installers are included as part of the total system cost.

Consumer Demand (Incentives)

Solarize Connecticut

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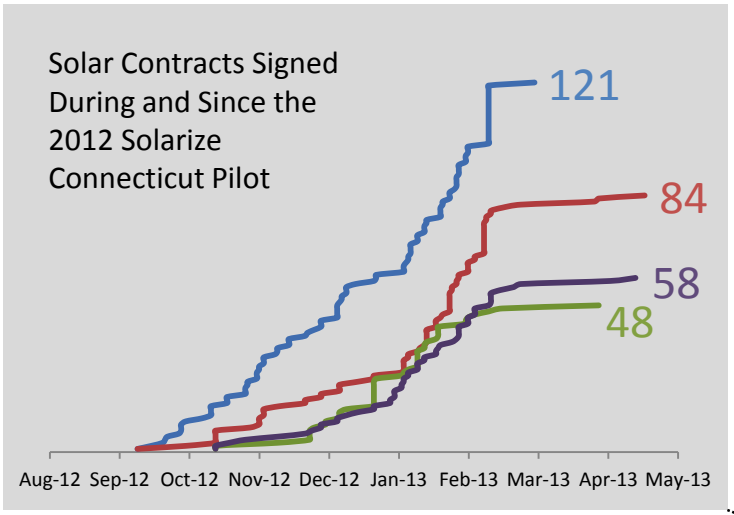
solarize connecticut
SPARKED BY CONNECTICUT GREEN BANK

SmartPower
Let's Get Energy Smart.®

Yale



CT Solar Loan (Co-Investment)

$5 MM Crowdfund to $100 MM Private

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Connecticut Green Bank

Digital Federal Credit Union

$100 MM Agreement

NJ, FL, NY, TX)

Monthly Loan Payment

Loan Agreement

Customer

Solar Industry

Mosaic and Connecticut Team Up On Crowd Funding of Residential Solar

Mosaic has partnered with Connecticut Green Bank and Sungage Financial to package loans made to homeowners…

Michael Puttre (February 2014)

pv magazine

PHOTOVOLTAIC MARKETS & TECHNOLOGY

Sungage Financial Secures $100 Million for Solar Loan

Following its participating in the CT Green Bank solar loan program, the Boston startup is aiming to expand residential solar loans on the East Coast.

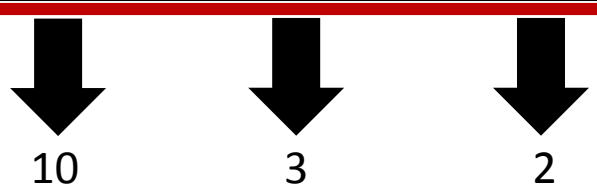
Edgar Meza (November 2014)

Residential Solar PV in CT

Deployment by Area Median Income

Census Tract Income Level (AMI)	# of Census Tracts	Tract Households	# of Projects	Installed Capacity (kW)	Projects per 1,000 Households	Watts/ Tract Households
Less than 60%	166	224,393	1,015	6,115	4.5	27.3
60-80%	118	216,437	1,976	13,390	9.1	61.9
80-100%	137	231,014	3,312	23,754	14.3	102.8
100-120%	160	278,174	5,552	41,907	20.0	150.7
More than 120%	246	406,185	8,279	65,766	20.4	161.9
Total	**827**	**1,356,203**	**20,452**	**153,500**	**15.1**	**113.2**

For LMI to reach non-LMI market penetration, solar PV deployment in less than 60% AMI, 60-80% AMI, and 80-100% AMI, projects/1,000 households **would have to increase by approximately 4.5 times, 2.2 times and 1.4 times respectively**



REFERENCES

Note – projects include both Connecticut Clean Energy Fund and Connecticut Green Bank. Totals are greater than individual lines due to some projects falling in unclassified census tracts. Data as of Residential Solar Investment Program (RSIP) Market Watch Report of July 15, 2016.

PosiGen (Co-Investment)

$15-$20 MM Capital for LMI Market Target

Home
(New Haven – Oil Heat)

$59,250 HHI
$2,963 Energy Costs

5.0% HHI on Energy Costs

+

Solar PV (Lease)

Up to $85/month Lease
$427 Energy Savings

4.3% HHI on Energy Costs

+

Energy Efficiency (ESA)

Up to $15/month ESA Energy Savings

Additional Savings
$543

3.4% HHI on Energy Costs

REFERENCES

Note – analysis examines 20-year lease for a 6-kW system at an $85 monthly cost and an additional $15 for energy efficiency measures through a 20-year energy savings agreement with (i.e., HES core services plus insulation) expected energy savings. Based on oil-heated home in New Haven.


SOLAR SOLUTIONS

Smart-E Loan (Credit Support)

$28 MM Loan Capital Available

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COREPLUS CREDIT UNION cpcu Smart Banking. Community Trusted.

ion BANK

eastern savings bank Because it matters.

nutmeg state financial CREDIT UNION

Thomaston Savings Bank

Patriot Bank

WORKERS' FEDERAL Credit Union Serving the Community For Over 75 Years.

Union Savings Bank

- **Rates** – competing on not-to-exceed interest rates (4 lenders)
- **Terms** – offering up to 12-year terms (5 lenders)
- **Amount** – several offering up to $40,000 and down to $500 (2 lenders)
- **Lower Credit** – offering loans for FICO scores between 640-679 (5 lenders)
- **Measures** – predominantly HVAC, hot water, and solar PV… and supports healthy home too
- **Credit Support** – $2.5 MM 2nd loan loss reserve to attract $28 MM of loan capital

C-PACE Financing

Nearly 90% “Open for Business”

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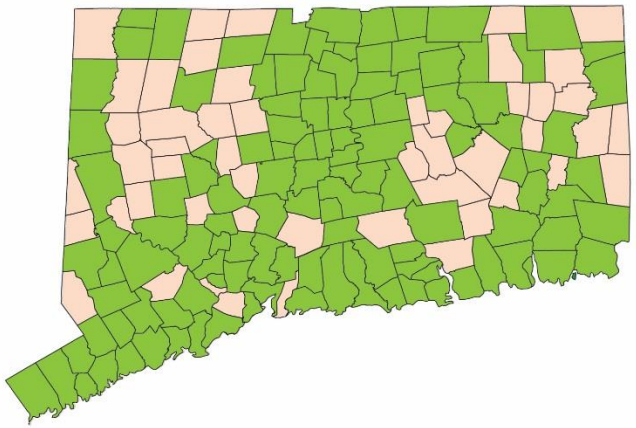
More Green Communities

118 participating cities and towns can use C-PACE to fuel economic development, make their community cleaner and help their citizens thrive.



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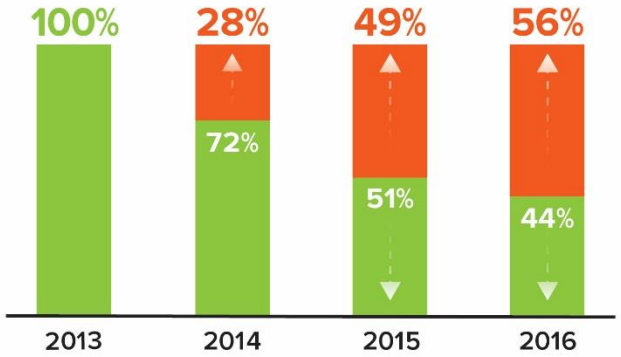
Total Capital Invested

Since program inception, the Green Bank is using fewer of its dollars to attract a growing amount of private capital.



Q1 16

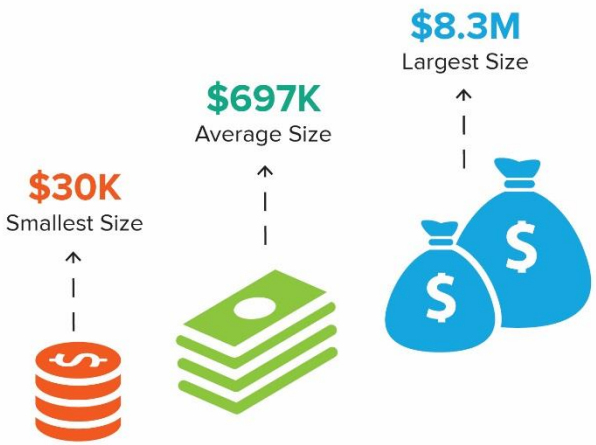
REFERENCES

Pace SETTERS News for Q1 of 2016

C-PACE
Project Sizes and Shapes

All Sizes of Projects

C-PACE can bring virtually any green energy project, small or large, from a vision to a reality.



Q1 16

All Shapes of Properties

From manufacturing facilities to YMCAs all commercial properties are eligible to use C-PACE for an energy saving project.

Q1 16

REFERENCES
Pace SETTERS News for Q1 of 2016

C-PACE (Warehousing)

Public-Public-Private Partnership

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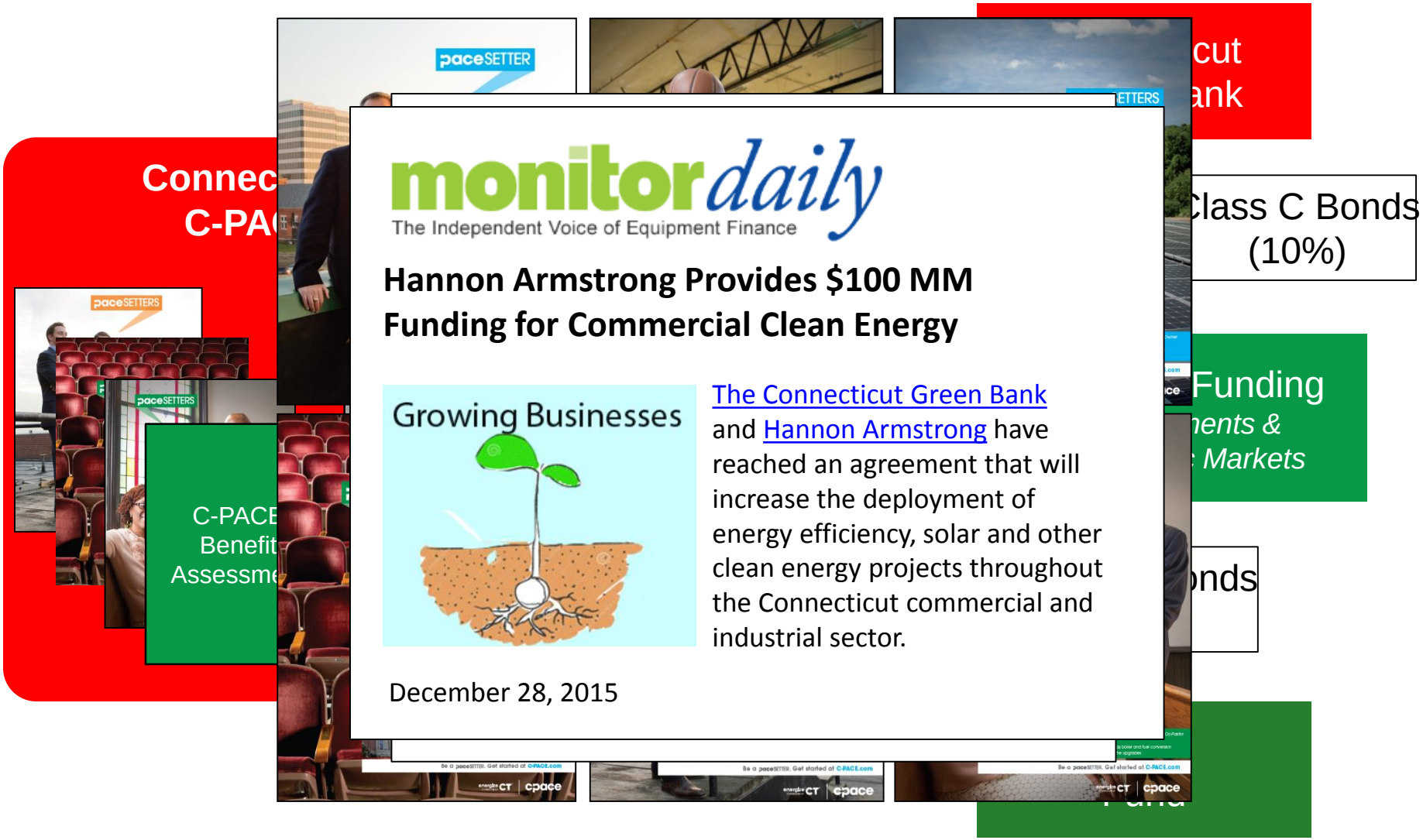


What Impacts are Being Achieved through the Connecticut Green Bank?

Connecticut Green Bank

Accelerate Green Energy Deployment

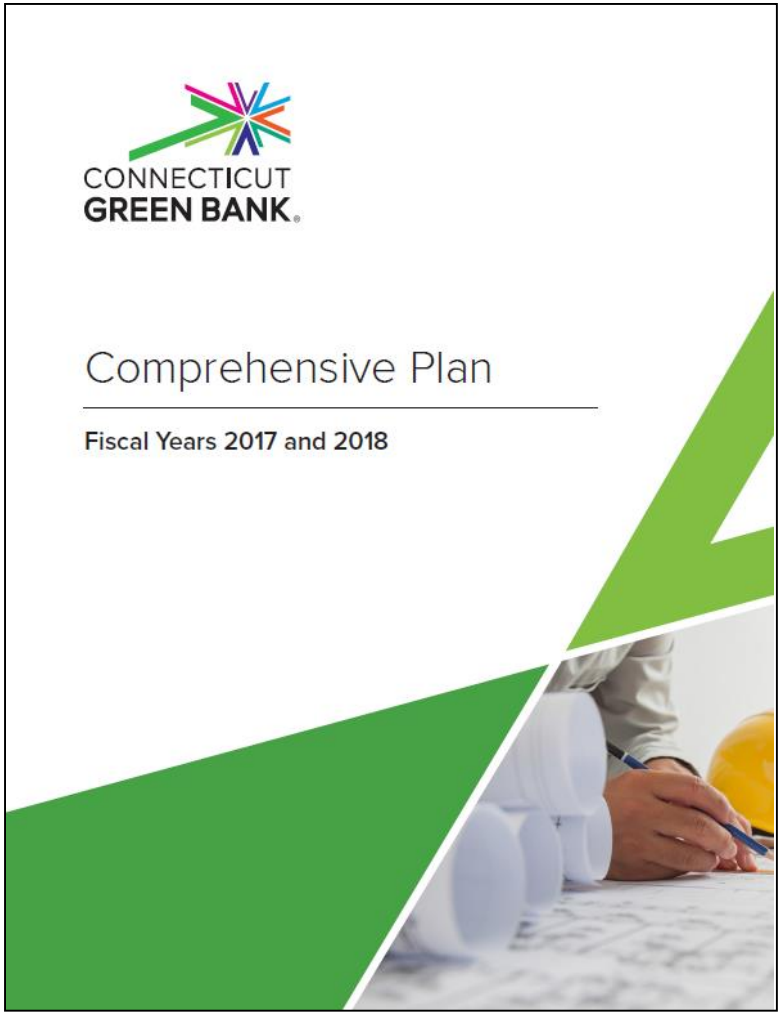
	FY 2000-FY 2011 (CCEF)	FY 2012-FY 2016 (CGB) [1]
Model	VC and Subsidy	Financing
Years	11.00	5.00
Energy (MW)	43.1	208.2
Investment ($MM)	$349.2	$985.0
Leverage Ratio	1:1	7:1
% of Funds as Loans	10	50

Deploying **more** green energy at a **faster** pace while using ratepayer-taxpayer resources **responsibly**

REFERENCES

1. Approved, closed, and completed transactions

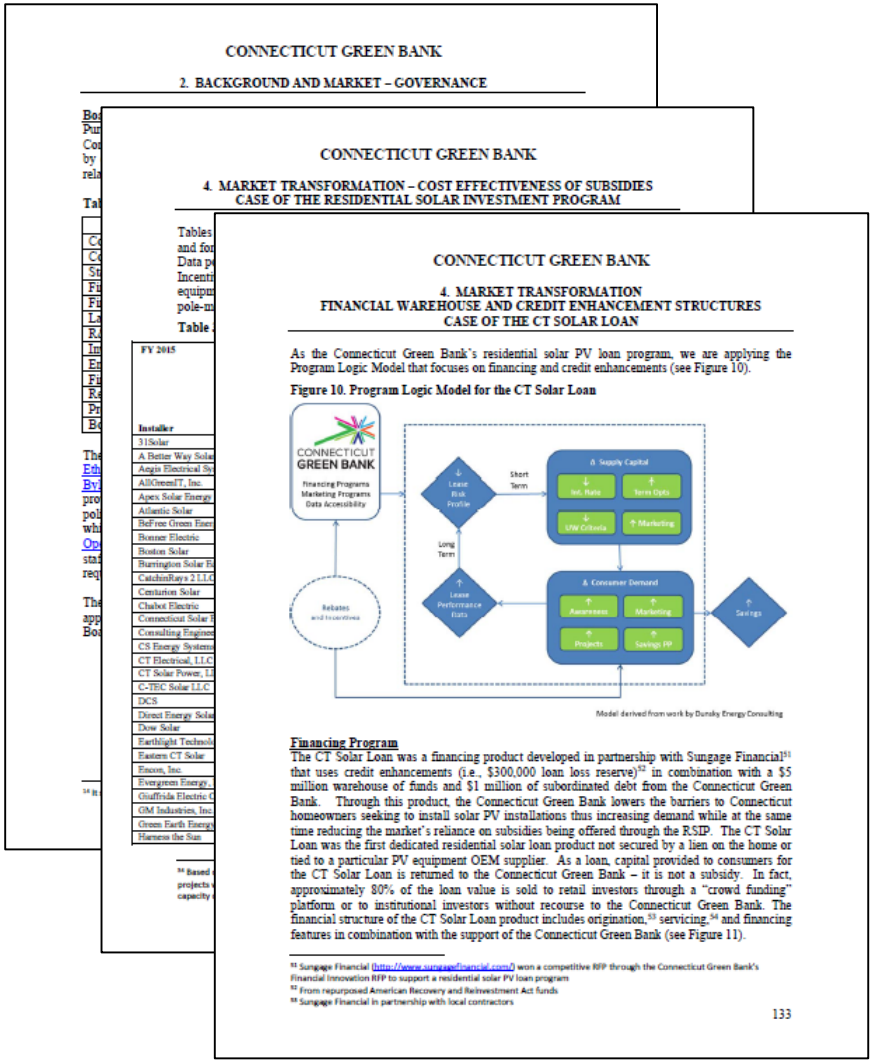
Comprehensive Plan
FY 2017 and FY 2018



Gold Standard in Reporting

Comprehensive Annual Financial Report

- **FY 2015** – filed Comprehensive Annual Financial Report (CAFR) to Government Finance Officers Association (GFOA). Seeking recognition in governmental accounting and financial reporting.
- **Financial Statistics** – audited financial statements for the organization
- **Non-Financial Statistics** – public benefit outputs and outcomes from the organization's activities



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2. BACKGROUND AND MARKET – GOVERNANCE

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4. MARKET TRANSFORMATION – COST EFFECTIVENESS OF SUBSIDIES
CASE OF THE RESIDENTIAL SOLAR INVESTMENT PROGRAM

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4. MARKET TRANSFORMATION
FINANCIAL WAREHOUSE AND CREDIT ENHANCEMENT STRUCTURES
CASE OF THE CT SOLAR LOAN

As the Connecticut Green Bank's residential solar PV loan program, we are applying the Program Logic Model that focuses on financing and credit enhancements (see Figure 10).

Figure 10. Program Logic Model for the CT Solar Loan

Model derived from work by Dunsky Energy Consulting

Financing Program

The CT Solar Loan was a financing product developed in partnership with Sungage Financial[51] that uses credit enhancements (i.e., $300,000 loan loss reserve)[52] in combination with a $5 million warehouse of funds and $1 million of subordinated debt from the Connecticut Green Bank. Through this product, the Connecticut Green Bank lowers the barriers to Connecticut homeowners seeking to install solar PV installations thus increasing demand while at the same time reducing the market's reliance on subsidies being offered through the RSIP. The CT Solar Loan was the first dedicated residential solar loan product not secured by a lien on the home or tied to a particular PV equipment OEM supplier. As a loan, capital provided to consumers for the CT Solar Loan is returned to the Connecticut Green Bank – it is not a subsidy. In fact, approximately 80% of the loan value is sold to retail investors through a "crowd funding" platform or to institutional investors without recourse to the Connecticut Green Bank. The financial structure of the CT Solar Loan product includes origination,[53] servicing,[54] and financing features in combination with the support of the Connecticut Green Bank (see Figure 11).

[51] Sungage Financial (http://www.sungagefinancial.com/) won a competitive RFP through the Connecticut Green Bank's Financial Innovation RFP to support a residential solar PV loan program
[52] From repurposed American Recovery and Reinvestment Act funds
[54] Sungage Financial in partnership with local contractors

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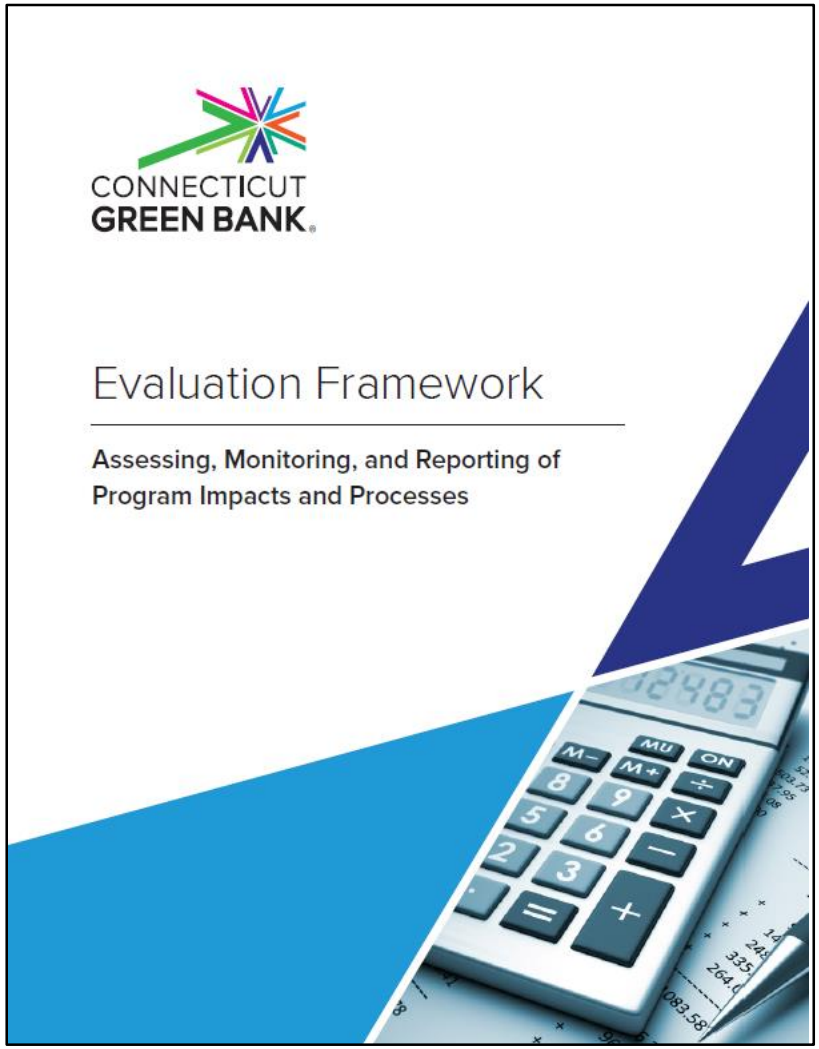
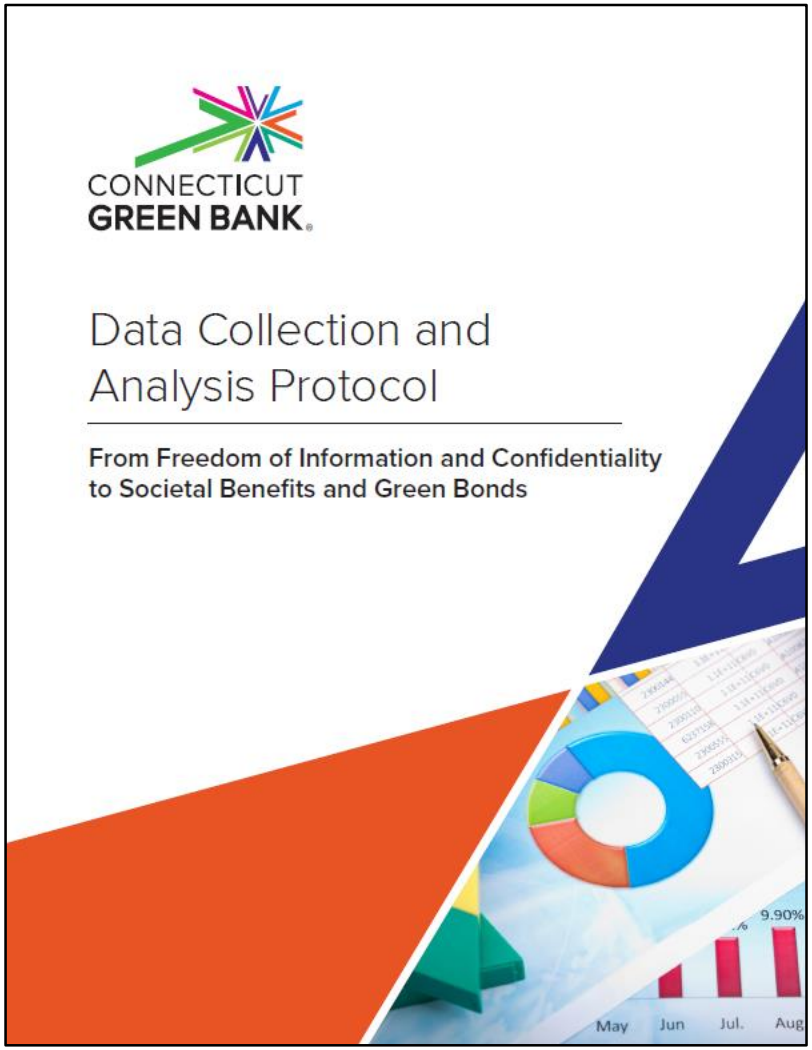
Developing Evaluation Standard

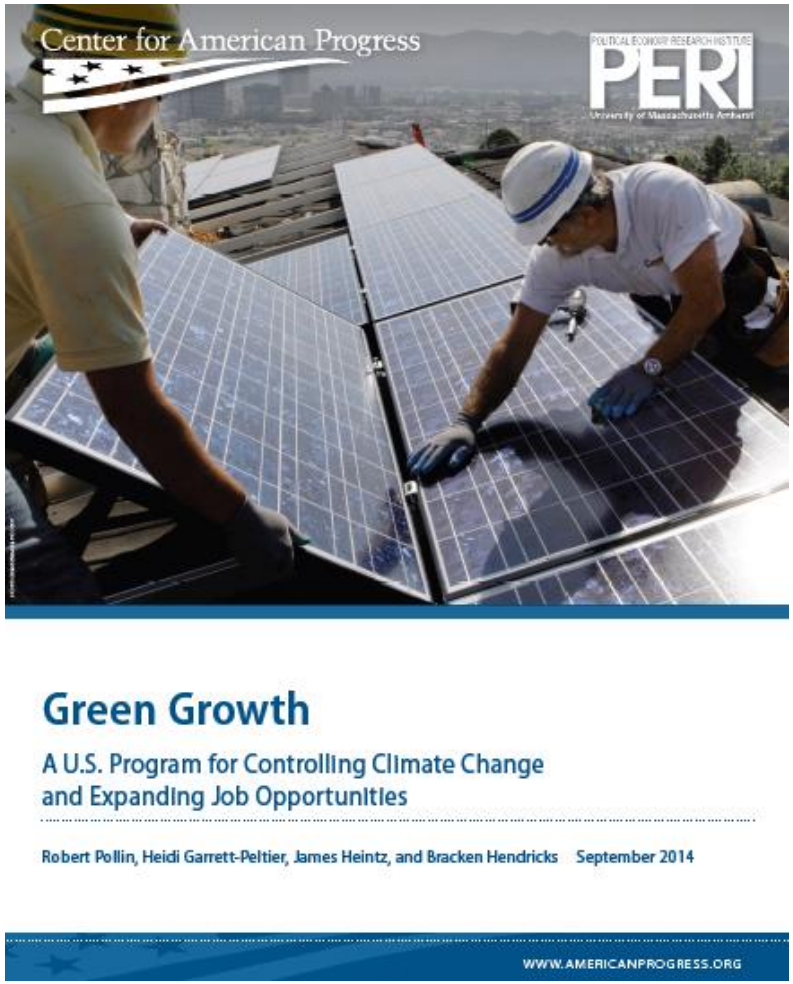
Specifically for Green Banks





U.S. Investment Needed

Avoid Climate Disaster



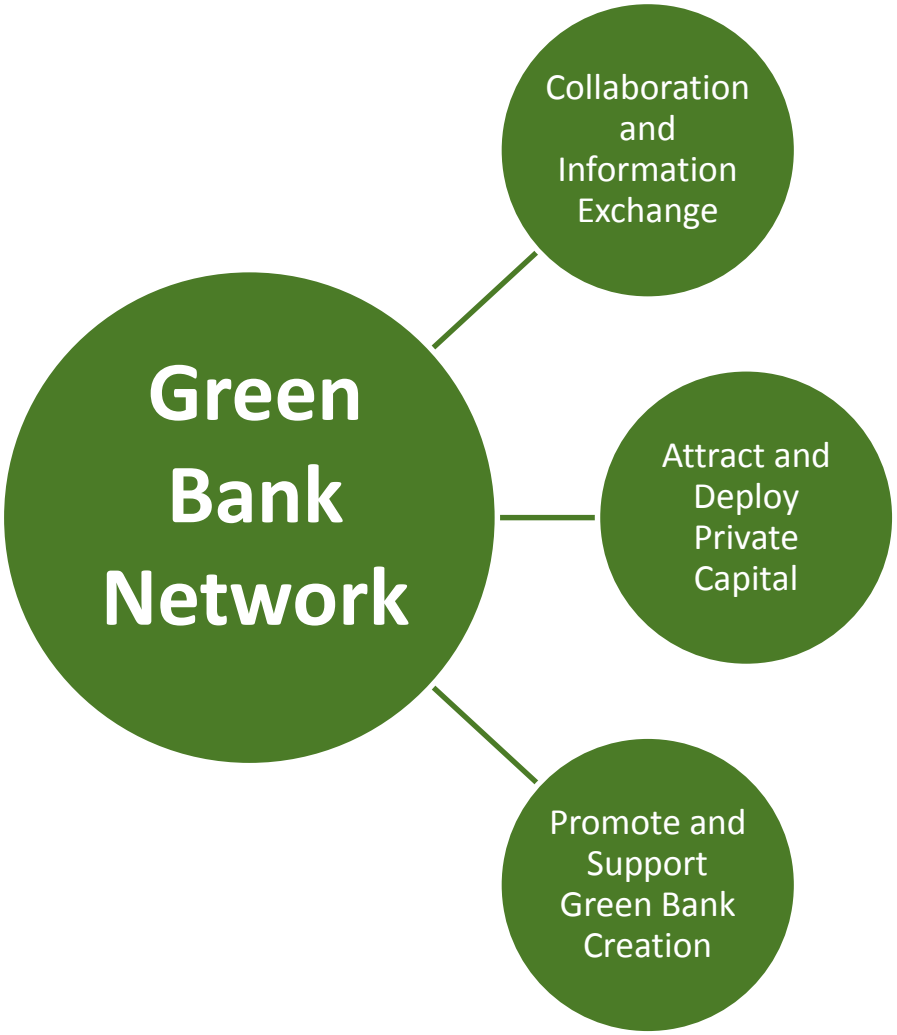
- The Center for American Progress estimates that the **U.S. needs at least $200 billion** in renewable and efficiency investment **annually for 20 years** to reduce carbon emissions and **avert climate disaster**.

Connecticut Green Bank
An NRDC and CGC Observation

- **Based on Connecticut** and its market size, growth rate, and public-private leverage ratio, we estimate that **a Green Bank in every state in America** would **yield $200 billion in national annual investment within 5 years**, with 90% of the funds coming from private sources and all taxpayer contributions returned over 10 to 20 years.

Green Bank Network

Public-Private Partnerships Worldwide



NRDC

coalition for green capital

Green Investment Bank

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CEFC
CLEAN ENERGY FINANCE CORPORATION

NYGREEN BANK
A DIVISION OF NYSERDA

GreenTech Malaysia

Japanese Green Fund

REFERENCE
Information provided by the Coalition for Green Capital

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