



CONNECTICUT
GREEN BANK SM

Green Banks: Accelerating the Energy Transition

Québec Mines + Énergie

20 Nov 2018

Agenda

- **Global/Canadian Climate Context**
 - Moment of Opportunity
 - A Period of Urgency
- **Good Policy as an Enabler – the “States” in action**
 - Initiatives
 - Using Carbon Taxes to Fund Energy Efficiency & Renewables
- **Green Bank Model – How It Works**
 - Sources & Uses
 - Examples of Green Bank Products & Projects
 - Capital Raised & Impact
- **Green Bank Success – a Global Phenomenon – the “GBN”**

Global/Canadian Climate Context - Moment of Opportunity



Global/Canadian Climate Context – A Period of Urgency

**The world has just over a decade to get
climate change under control,
U.N. scientists say**



The image is a composite of two parts. On the left is a video frame showing Jim Skea, a man with white hair and a beard, wearing a dark suit and a red tie, speaking at a podium. On the right is a presentation slide with a yellow background and a photograph of a field with a bird in flight. The slide is titled 'Greenhouse gas emissions pathways' and contains a bullet point: 'National pledges are not enough to limit warming to 1.5°C'. At the bottom of the slide, there is a logo for 'ipcc' and the text 'INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE'. At the bottom of the video frame, there is a logo for 'ipcc' and the text 'JIM SKEA INTERGOVERNMENTAL PANEL ON CO-CHAIR OF WORKING GROUP III OF IPCC'.

Greenhouse gas emissions pathways

- National pledges are not enough to limit warming to 1.5°C

ipcc
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

ipcc
JIM SKEA
INTERGOVERNMENTAL PANEL ON
CO-CHAIR OF WORKING GROUP III OF IPCC

Global/Canadian Climate Context – A Period of Urgency



▲ A firefighter battles a fire in California. The world is currently 1C warmer than preindustrial levels. Photograph: Ringo HW Chiu/AP

UNITED STATES CLIMATE ALLIANCE



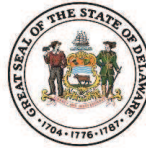
CALIFORNIA



COLORADO



CONNECTICUT



DELAWARE



HAWAII



MARYLAND



MASSACHUSETTS



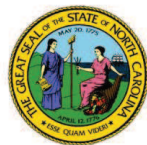
MINNESOTA



New Jersey



NEW YORK



NORTH CAROLINA



OREGON



PUERTO RICO



RHODE ISLAND



VERMONT



VIRGINIA



WASHINGTON

Each Member State Commits to:

- Implement policies that advance the goals of the Paris Agreement, aiming to reduce greenhouse gas emission by at least 26-28 percent below 2005 levels by 2025
- Track and report progress to the global community in appropriate settings, including when the world convenes to take stock of the Paris Agreement, and
- Accelerate new and existing policies to reduce carbon pollution and promote clean energy deployment at the state and federal level.

GLOBAL CLIMATE ACTION SUMMIT

September 12-14, 2018

San Francisco, CA

HEALTHY ENERGY SY

INCLUSIVE ECONOMIC

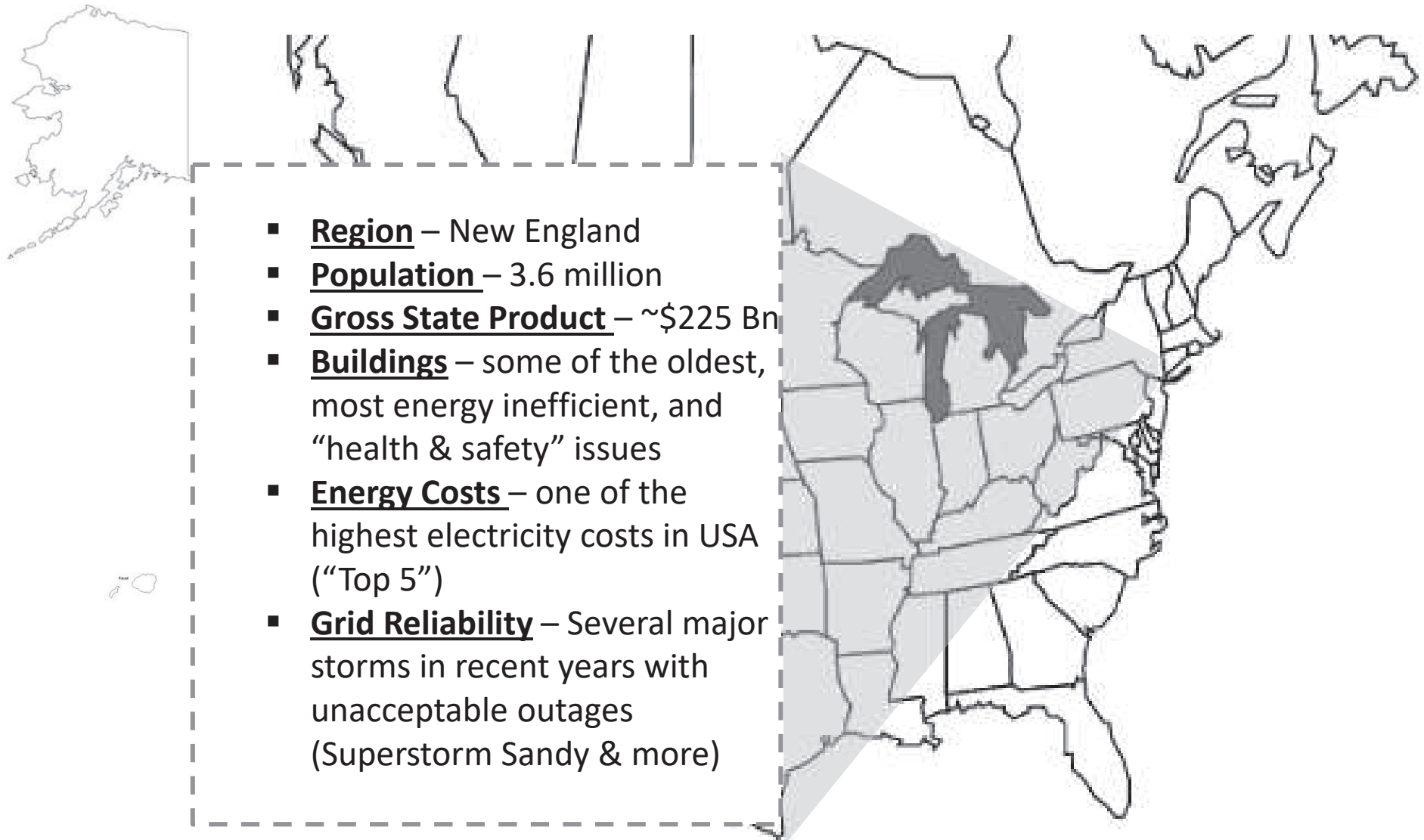
SUSTAINABLE COMMU

LAND AND OCEAN STEW

TRANSFORMATIVE CLIM

Connecticut

Microcosm of the United States



- **Region** – New England
- **Population** – 3.6 million
- **Gross State Product** – ~\$225 Bn
- **Buildings** – some of the oldest, most energy inefficient, and “health & safety” issues
- **Energy Costs** – one of the highest electricity costs in USA (“Top 5”)
- **Grid Reliability** – Several major storms in recent years with unacceptable outages (Superstorm Sandy & more)

Connecticut – A Comprehensive Approach to Climate Policy

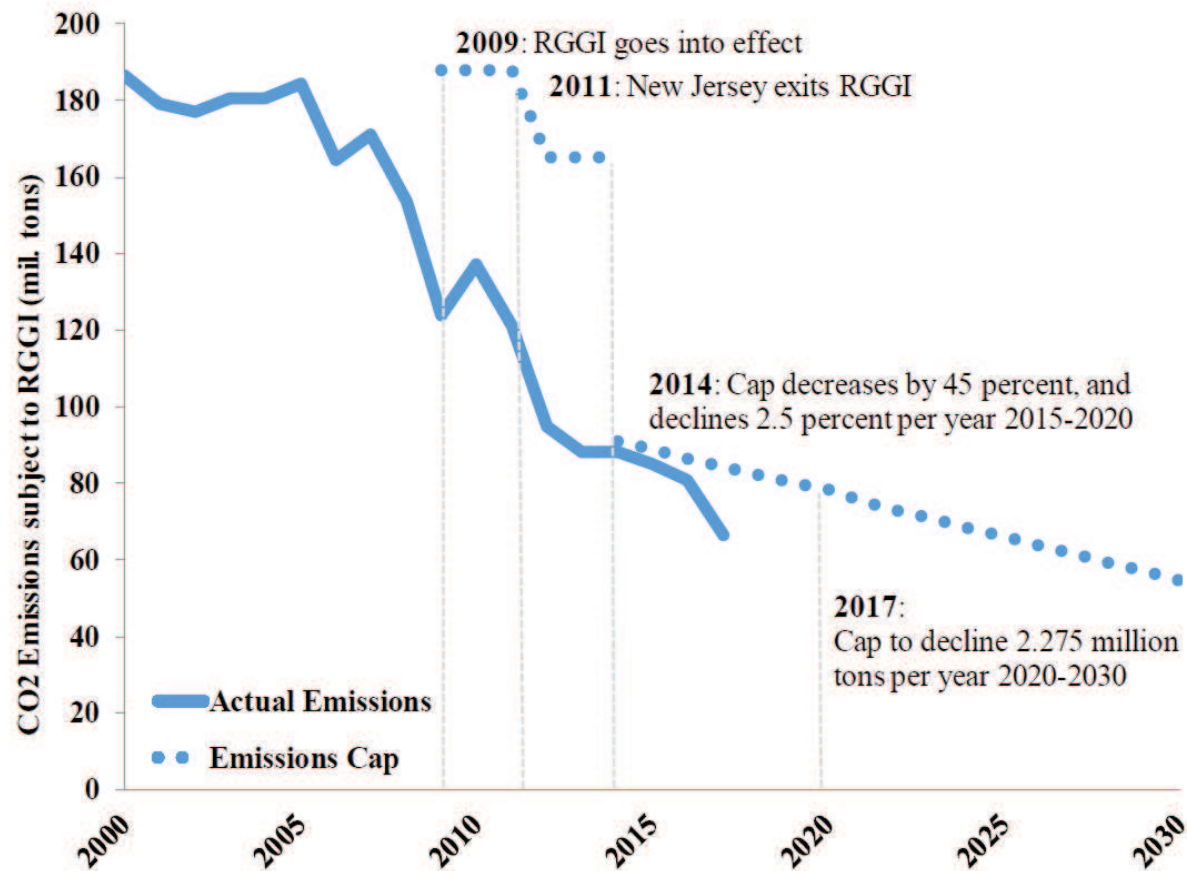
- “Bi-Partisan” support for Energy Policy
- Comprehensive Energy Strategy (every 3 yrs)
 - Governor’s Council on Climate Change
 - Regional Greenhouse Gas Initiative
(7 states – first “cap-and-trade” program for CO2 emissions (2008))
 - ZEV MOU – 8 states
 - Energy Efficiency Fund (Jan 2000)
 - Clean Energy Fund (July 2004)
 - CT Green Bank (July 2011)

Utility (electricity) Tariffs & Policies are also Important
(TOU, demand charges, T&D, adders – Net Metering)

Regional Greenhouse Gas Initiative – A Policy Success!

Figure ES-1

Actual CO₂ Emissions in the RGGI States and Evolution of the RGGI CO₂ Emissions Cap



Source: RGGI, Inc. data from the RGGI CO₂ Allowance Tracking System (COATS), accessed March 2, 2018.

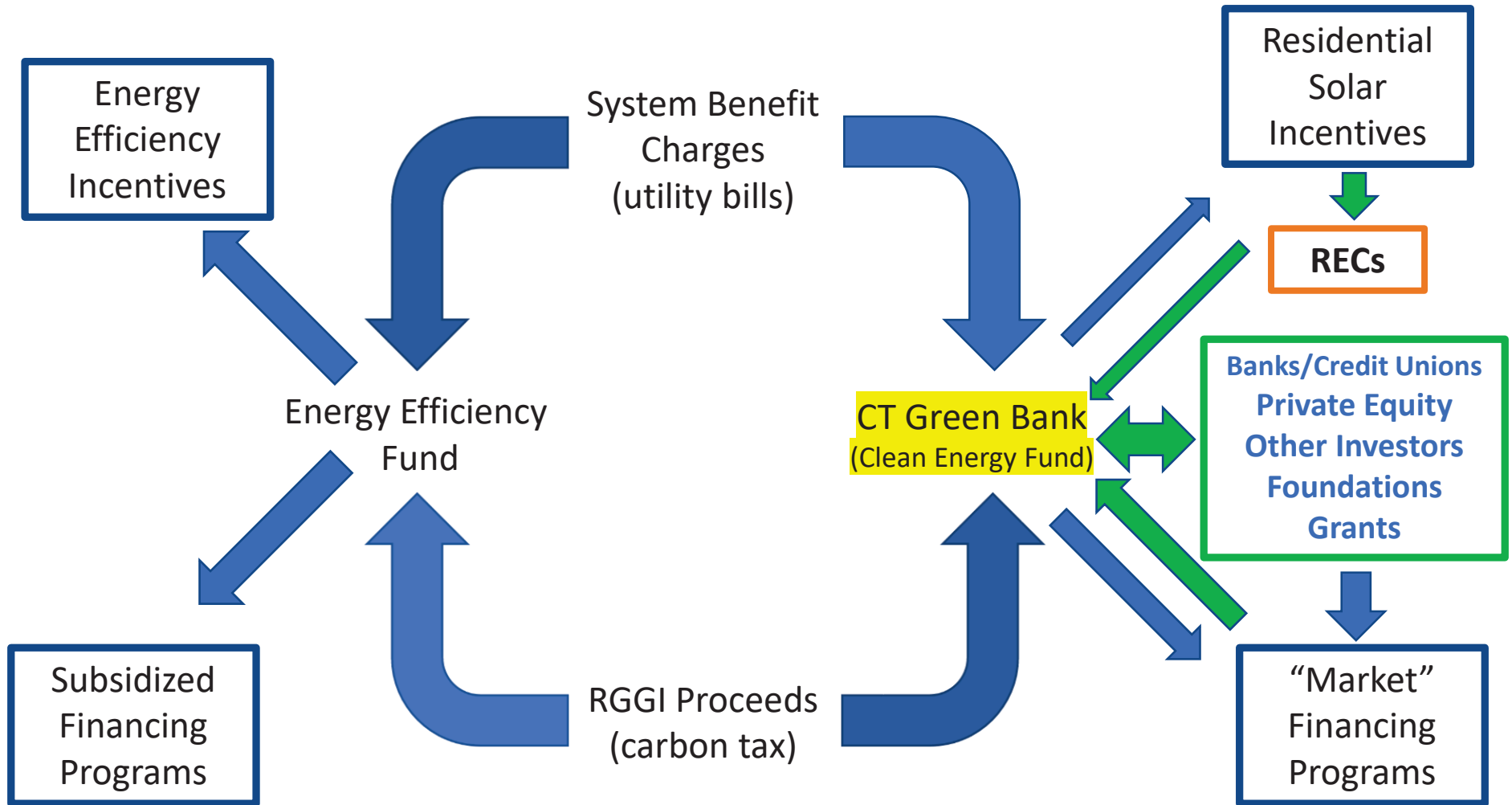
Regional Greenhouse Gas Initiative – A Policy Success!

- Proceeds distributed to member states (formula) – 9 yrs - **\$2.8 Bn**
 - EE measures and programs;
 - RE projects;
 - GHG-emission reduction measures;
 - Direct electricity consumer bill assistance, incl for low-income households;
 - Education and job training programs
- **IMPACT:**
 - **2015-17:** \$1.0 Bn in Allowance Collections
 - \$1.4 Bn Net Positive Economic Activity (NPV basis) – **40% GAIN**
 - \$34 in net positive value **per capita**
- **RGGI's first nine years (2009-2017) provide empirical evidence that carbon-control programs for the power sector can provide positive economic outcomes.**

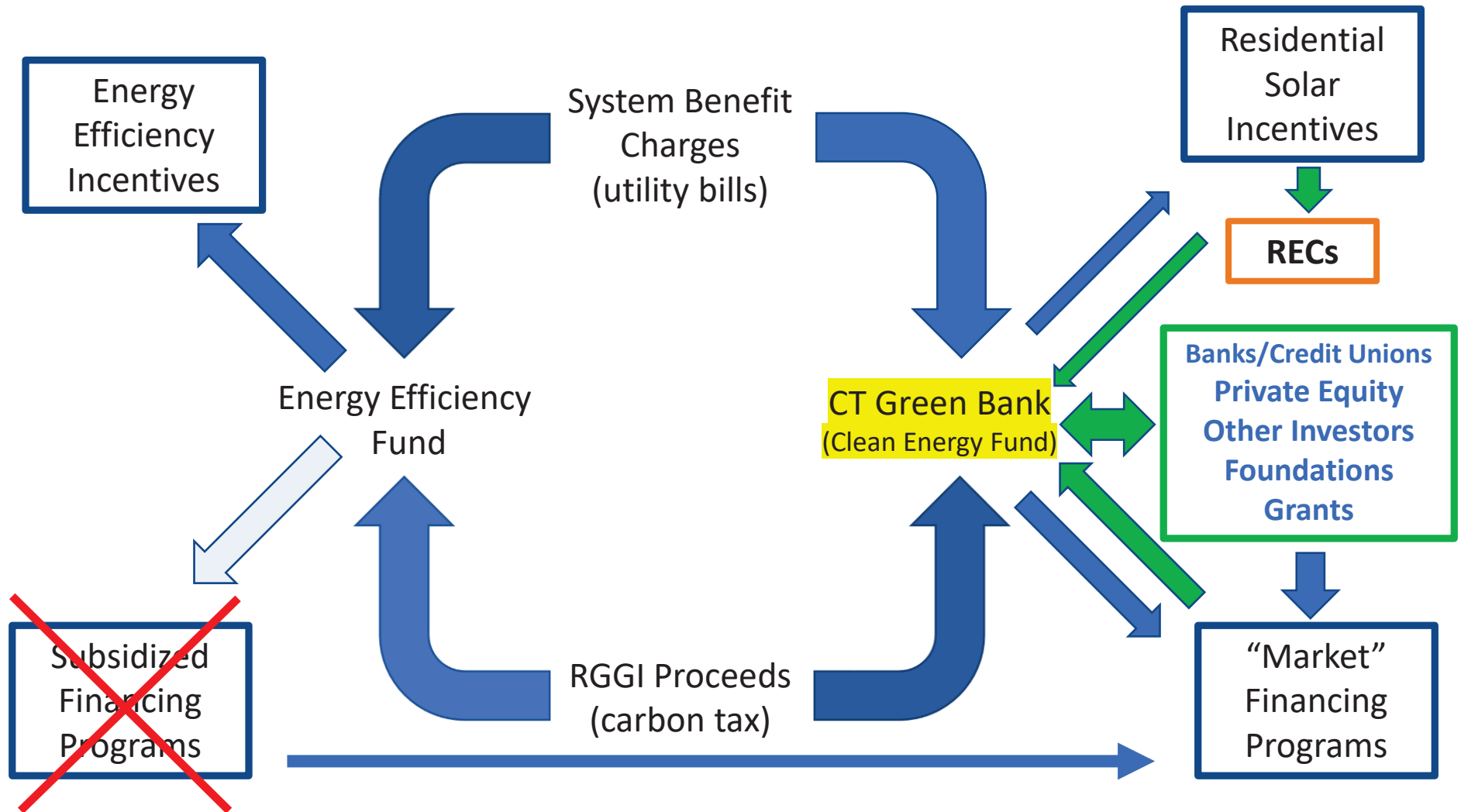
The Key? Reinvestment in Energy Efficiency & Renewables

http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_april_2018.pdf

Sources & Uses for CT Energy Efficiency & RE Programs

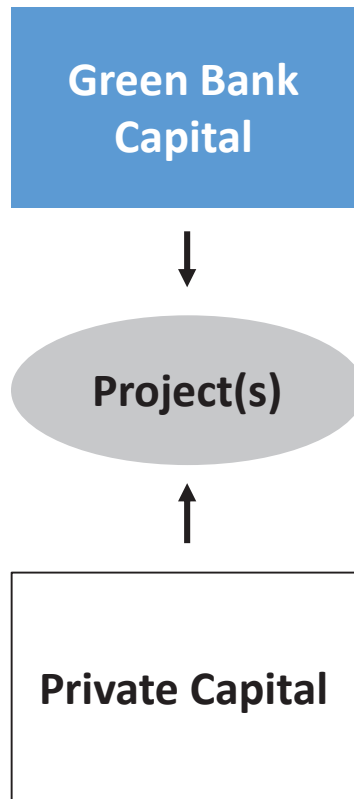


Sources & Uses for CT Energy Efficiency & RE Programs

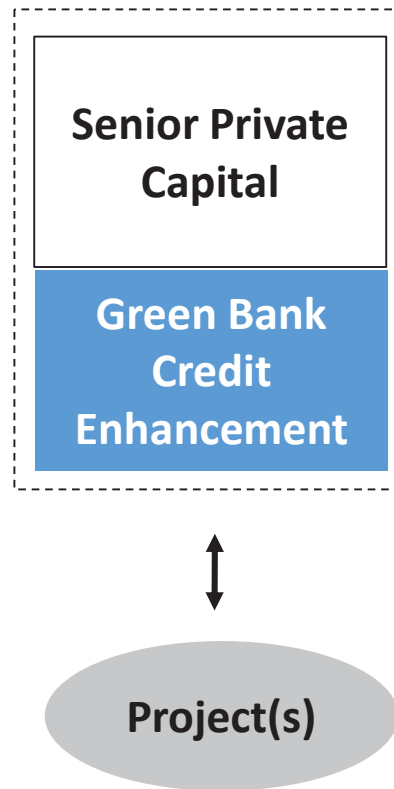


How Green Banks Leverage Public Capital with More Private Capital

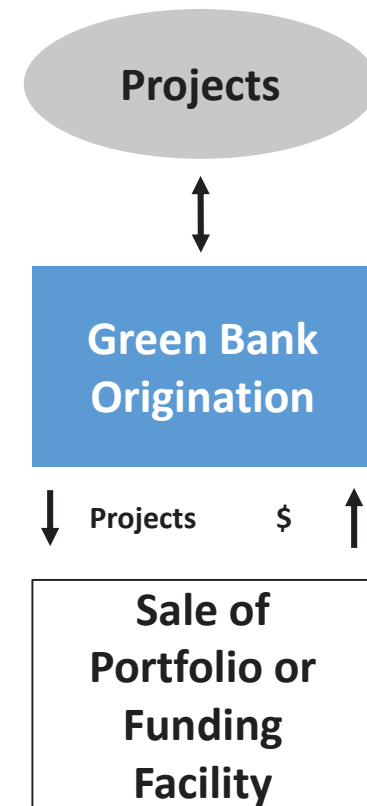
Co-Investment



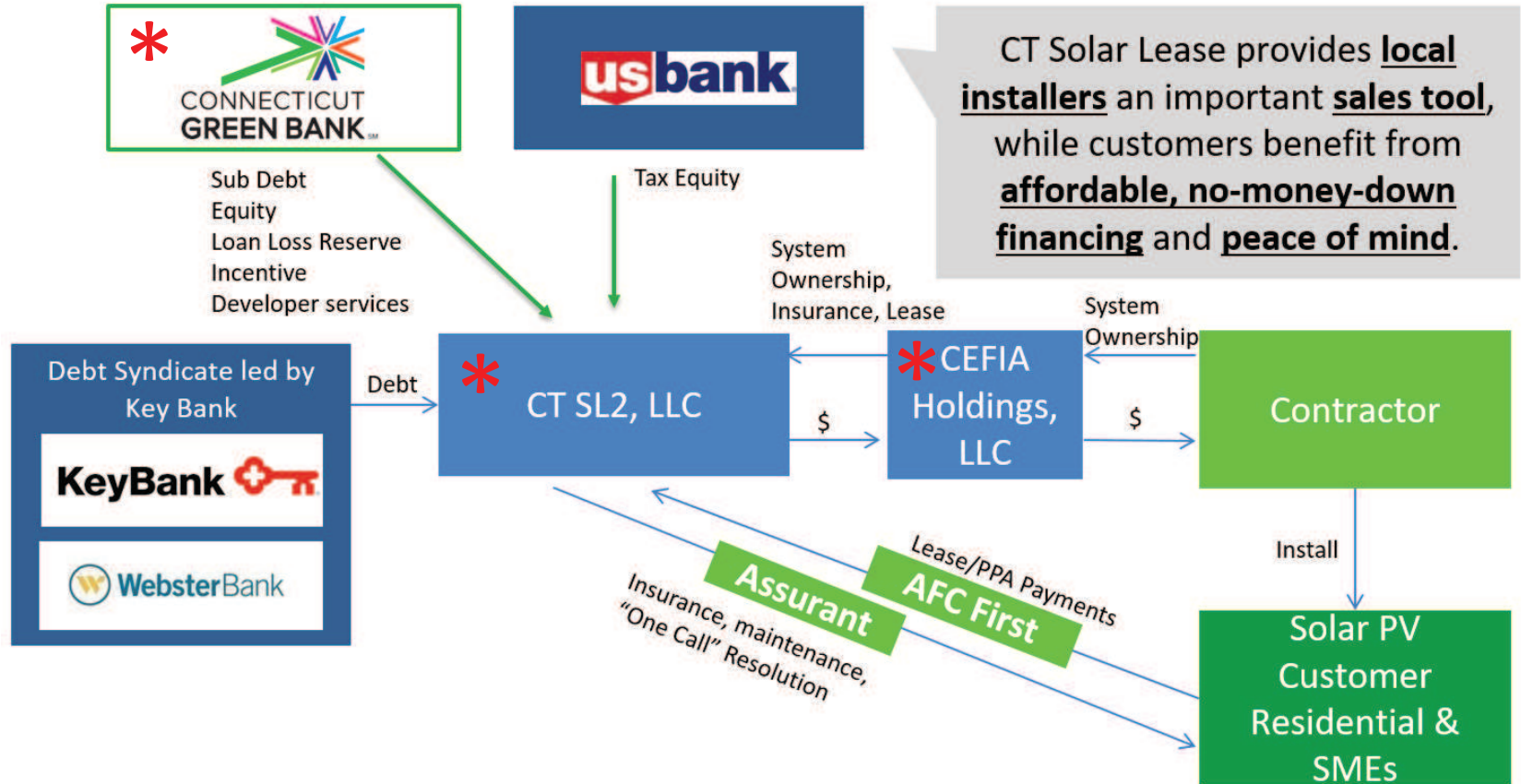
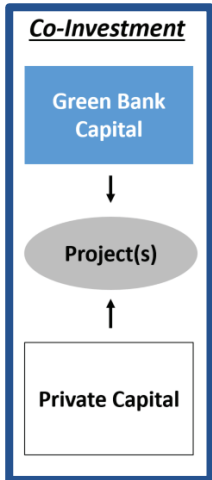
Credit Support



Warehousing

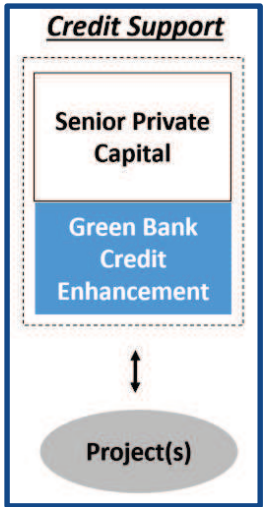


Connecticut Solar Fund (Residential & SMEs)



CT Solar Lease provides **local installers** an important **sales tool**, while customers benefit from **affordable, no-money-down financing** and **peace of mind**.

* = CT Green Bank Entity

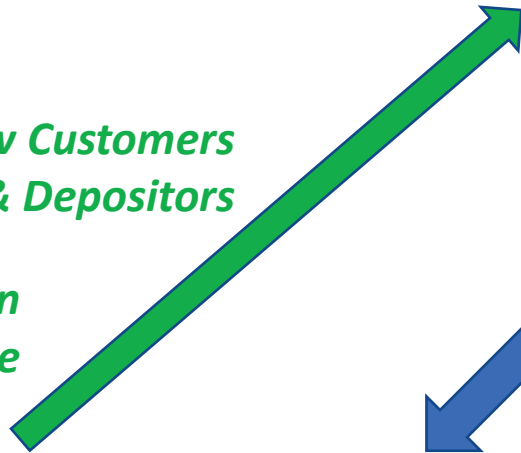


Loan Loss Reserve
T/A + Marketing



New Customers & Depositors

More Loan Volume



Lower Interest Rates



Longer Repayment Periods (5 – 12 Y)



Finance Your Next Smart Energy Project with a Smart-E Loan

Smart-E Loans



Introducing the Smart-E Loan!

A Smart-E Loan offers no money down, low-interest financing with flexible terms to help you upgrade your home's energy performance – and save money! Over 40 home improvement projects that reduce energy use and lower utility bill costs may qualify. With rates as low as 4.49% applying through a local lender is as easy as child's play!

What is a Smart-E Loan?	+
What Home Improvements Can I Finance with a Smart-E Loan?	+
How Do I Get Started with a Smart-E Loan?	+
Smart-E Loan Eligibility Requirements	+
Get Pre-Approved for a Smart-E Loan with a Participating Lender	+

Each lender has a landing page with contact information at www.energizecl.com/smart-e

RATES AS LOW AS **4.49%**
NO MONEY DOWN FLEXIBLE TERMS

Learn More About...

- Heat Pump Financing
- Natural Gas Conversion
- Smart-E Bundle

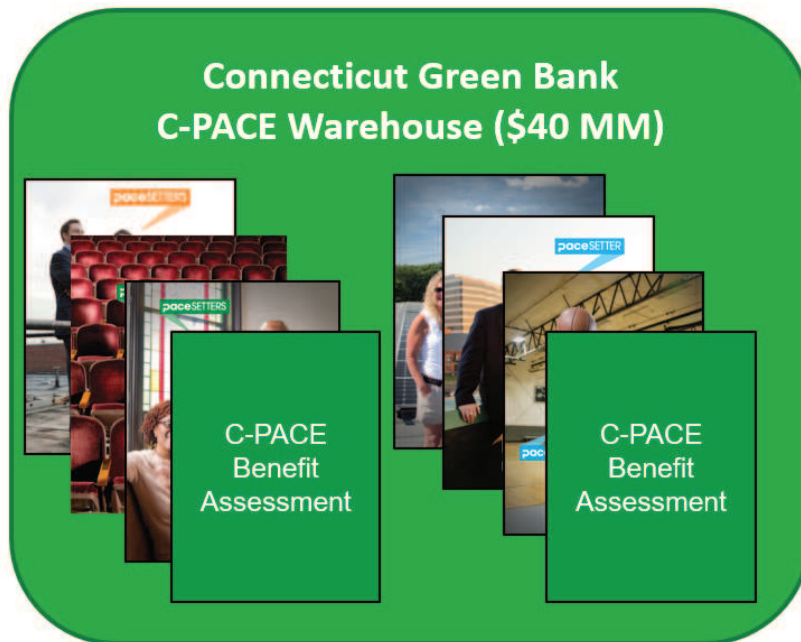
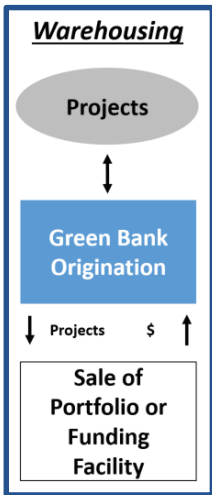
GET STARTED NOW

- Find A Smart-E Lender
- Find A Smart-E Contractor

STORIES

Smart-E Loans are cutting energy costs for homeowners like you.





Class B Bonds
(10%)

Class C Bonds
(10%)

\$30 Million in Funding
Private Placements & Ultimately Public Markets

Class A Bonds
(80%)

Clean Fund

C-PACE

Demand Continues to Increase



C-PACE is Growing

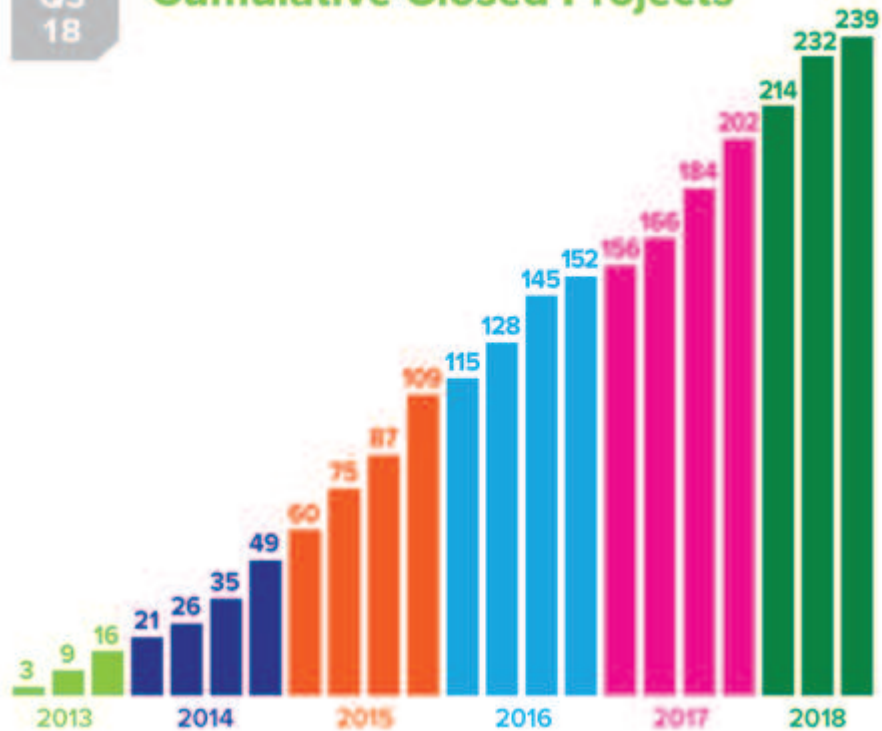
The total amount of project financing continues to grow as more energy saving projects are closed.



\$130.4M
total closed
project financing

Q3
18

Cumulative Closed Projects





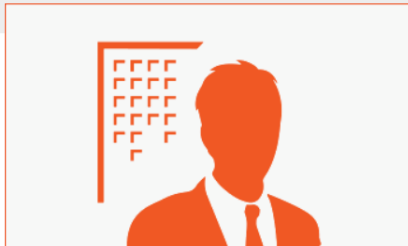
[Building Owner](#) [Contractor](#) [Municipality](#) [Capital Provider](#) [Mortgage Holder](#) [Appraiser](#)

[Apply Now](#) [Contact Us](#) [About Us](#)

Green energy financing that builds better businesses

C-PACE (Commercial Property Assessed Clean Energy) financing makes green energy upgrades more accessible and affordable. This innovative financing program is accelerating the green energy movement, and making a positive impact on many different stakeholders across Connecticut.

What type of stakeholder are you?



Building Owner



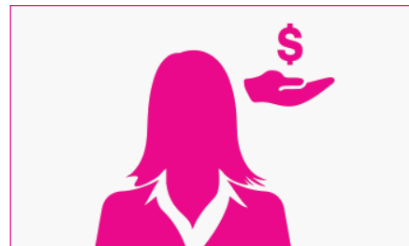
Contractor



Municipality



Capital Provider



Mortgage Holder



Appraiser



- **Solar for All Campaign Progress** – 835 installations in 17 months, 5.8 MW of solar PV
 - ✓ 71% of contracts are LMI*
- **Energy Efficiency Progress**
 - ✓ 99.9 % of households get Direct Install EE measures
 - ✓ 66% of households also undertake “deeper” energy efficiency projects through \$10 ESA payment/month for 20 years
- **Community Campaigns** – in Bridgeport, Hartford, New Haven, New London
- **Jobs** – 62 current CT based Employees



Multifamily Programs / “Social Housing”

Technical assistance and financing to help owners save money on energy, increase property values, and improve tenants’ safety & comfort.

Pre-Development Resources

Benchmark CT

- Free energy benchmarking resource



Sherpa Loan

- Designated service provider
- Standardized process & fee schedule



Navigator Loan

- Client managed contractor(s)
- Customized technical services



Project Financing

LIME

- Low Income Multifamily Energy
- Affordable
- Unsecured



Solar

- Solar projects only
- Commercial solar lease



Gap Financing

- Flexible low-cost financing
- Energy & health/safety



Electric Vehicle Charging Carbon Coalition (EVCCC)



Partner organizations seeking to open access to carbon capital markets for EV charging systems, to strengthen their business case fundamentals and accelerate deployment

- Methodology in approval process, with potential for new revenue stream for EV charging site hosts
- Measures kWh dispensed during charging sessions
- Credits based on GHG emissions savings from fuel-switching, factoring in the electricity supply mix feeding the EV charger



Co-Investment

Project Finance Structures for Larger Projects

Fuel Cells, Small Hydro, Wind, District Heating Loops, Microgrids

Summary	Chunky, economically valuable projects where we take a risk position at a cheaper price.
Credit Type	Senior / Subordinate Debt or Equity Stake in single asset entity.
Channel to Market	Project-specific developers operating in target markets with technology solutions / business model innovations that demonstrate growth opportunity across specific or multiple geographies and have yet to reach capital markets scale.
Opportunity	<p>Good spread & deal fees. Risk tolerance at same price potentially greater than other capital markets players.</p> <p>Projects below utility scale have a high burn rate because of capital availability and timeline that we are able to uniquely address.</p>
Challenges	<p>Where longer-term debt is required, may require long-term investment capital that is not easily available.</p> <p>Requires greater risk positions in some cases.</p>



Public-Private Partnerships

OVER \$500 million in private capital raised



<p>\$65 MM CLOSED 10:1</p> <p>Grid-Tied</p>	<p>\$6 MM CLOSED 6:1</p> <p>Residential Solar</p>	<p>\$75 MM CLOSED 7.5:1</p> <p>Residential Solar Commercial Solar</p>	<p>\$30 MM CLOSED 4:1</p> <p>C-PACE</p>	<p>\$30 MM OPEN 10:1¹</p> <p>Residential Energy</p>	<p>\$20 MM OPEN 4:1</p> <p>Residential Solar & Energy Efficiency</p>
<p>\$50-100 MM OPEN 9:1</p> <p>C-PACE</p>	<p>\$5 MM OPEN 100%²</p> <p>Multifamily Energy</p>	<p>\$60+ MM OPEN 6:1³</p> <p>Commercial Solar</p>	<p>\$3 MM TERM SHEET 100%⁴</p> <p>Residential Storage Commercial Storage</p>	<p>\$75 MM IN Process 100%⁴</p> <p>CT Green Bank REC Securitization</p>	<p>\$50 MM IN PROCESS 10:1</p> <p>Small Business Energy Advantage</p>

REFERENCES

1. LLR yields high leverage – and it is 2nd loss and thus with no to low defaults, we haven't used to date. IRB's not considered in the leverage ratio.
2. Foundation PRI is to HDF, guaranteed by the CGB in the case of MacArthur Foundation.
3. Onyx Partnership has no upper limit and CGB currently has authorization to commit up to \$15mm. The team expects to commit \$5mm for the first \$60-70mm.
4. Securitization of Solar Home Renewable Energy Credits - \$75mm in gross receivables securitized

Connecticut Green Bank



Innovations in American Government Awards 2017



★ **\$1 BILLION** ★
CLEAN ENERGY INVESTMENT ACROSS THE STATE

THE CONNECTICUT GREEN BANK, THE 2017 INNOVATIONS IN AMERICAN GOVERNMENT AWARD WINNER

HARVARD Kennedy School
ASH CENTER
for Democratic Governance and Innovation

★ **13,000** ★
NEW JOBS CREATED

THE CONNECTICUT GREEN BANK, THE 2017 INNOVATIONS IN AMERICAN GOVERNMENT AWARD WINNER

HARVARD Kennedy School
ASH CENTER
for Democratic Governance and Innovation

★ **2.6 MILLION** ★
TONS OF CO2 EMISSIONS REDUCED IN THE STATE

THE CONNECTICUT GREEN BANK, THE 2017 INNOVATIONS IN AMERICAN GOVERNMENT AWARD WINNER

ASH.HARVARD.EDU
@HARVARDASH



“Connecticut’s innovative programs are reducing energy costs for households of all income levels, [and] creating local jobs. Through these public-private partnerships and forward-thinking approaches, we are scaling clean energy deployment in Connecticut as we grow jobs.”

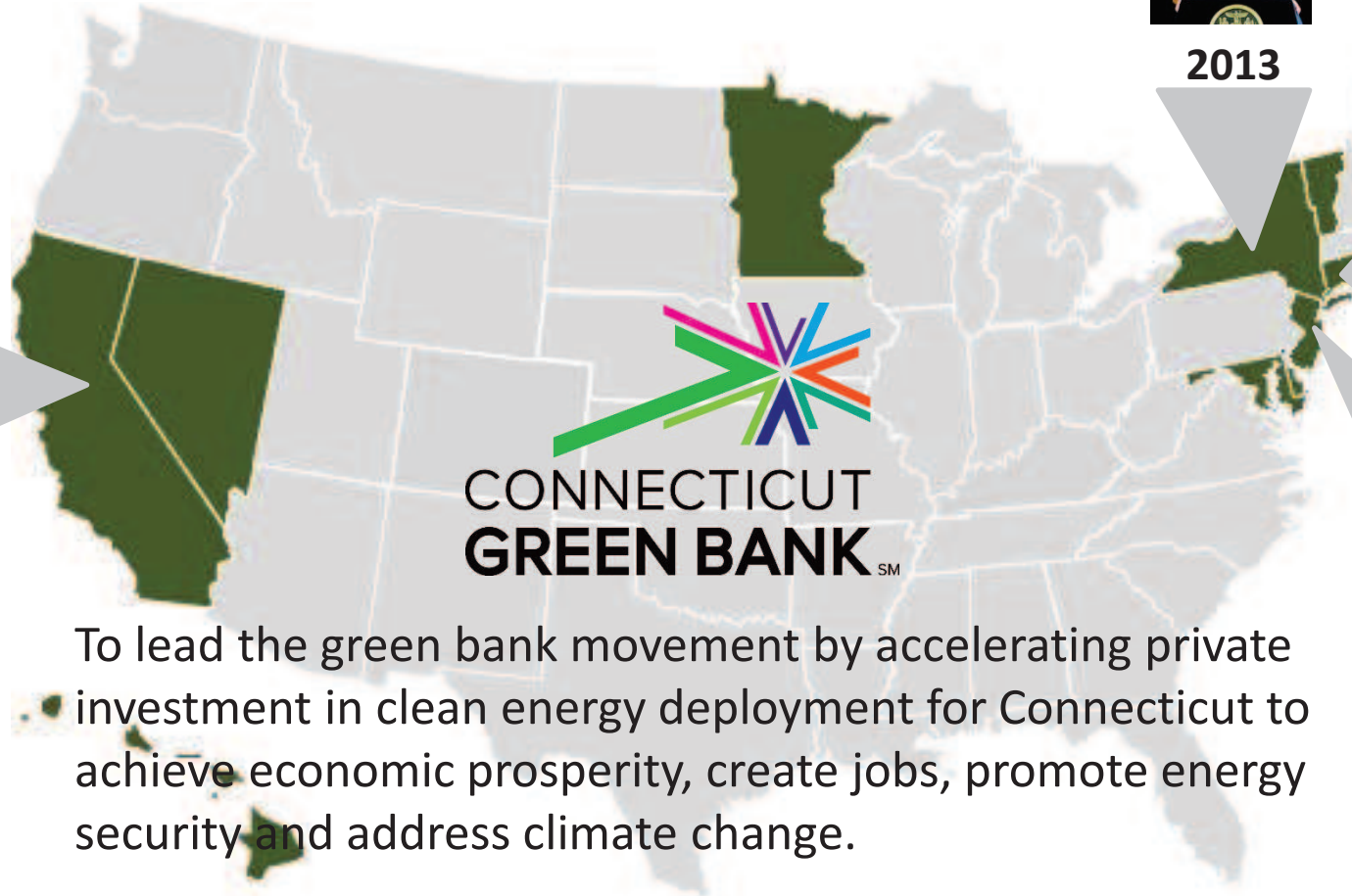
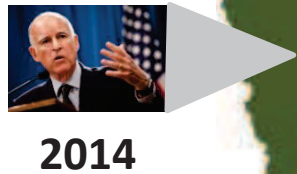
★ **CONNECTICUT GOVERNOR DANNEP. MALLOY** ★

THE CONNECTICUT GREEN BANK, THE 2017 INNOVATIONS IN AMERICAN GOVERNMENT AWARD WINNER

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Green Bank Movement United States Trends



To lead the green bank movement by accelerating private investment in clean energy deployment for Connecticut to achieve economic prosperity, create jobs, promote energy security and address climate change.



REFERENCES

Map provided by the Coalition for Green Capital

Sixth Annual Green Bank Congress

*Green Banks, Green Funds and Green Public-Private Partnerships:
Exploring Effective Tools to Mobilize Private Investment in Low Carbon, Climate Resilient
Infrastructure*

November 29, 2018 at the Ritz-Carlton Pudong in Shanghai, China

GBN

Green Bank Network



Q&A

Thank You!

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