



Empowering you to make
smart energy choices

Connecticut Green Bank

Providing Easy Access to Affordable Capital

CPES and REEBA Co-Hosted Monthly Dinner
February 11, 2015

Remarks

- **Overview** – What is the Connecticut Green Bank?
- **Residential Market** – Building a Sustainable Market for Clean Energy in Our Homes
- **Commercial and Industrial Market** – Attracting Private Investment to Finance Clean Energy Improvements in Buildings
- **The Movement** – Leading the Green Bank Movement

Overview

What is the Connecticut Green Bank?

Challenge

Mobilizing Private Investment in Clean Energy



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

...CEFIA 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.

Case in Point

Residential Clean Energy Measures

- Enable energy efficiency improvements for at least 15% of single family homes in the state by 2020 – approximately 150,000 homes at \$10,000 to achieve 20% energy reduction would require an investment of \$1.5 billion
- Support the conversion from oil to natural gas for at least 200,000 households in the state in 8 years – at \$7,500 for an average cost of conversion with equipment for an estimated investment of \$1.5 billion
- Estimate potential market of over 150,000 households to install solar PV in the state – at an average cost of \$30,000 per system would require an investment of \$4.5 billion

Connecticut Green Bank

Mission and Goals



Support the Governor's and legislature's energy strategy to achieve cleaner, cheaper and more reliable sources of energy while creating jobs and supporting local economic development

Attract and deploy capital to finance the clean energy goals for Connecticut

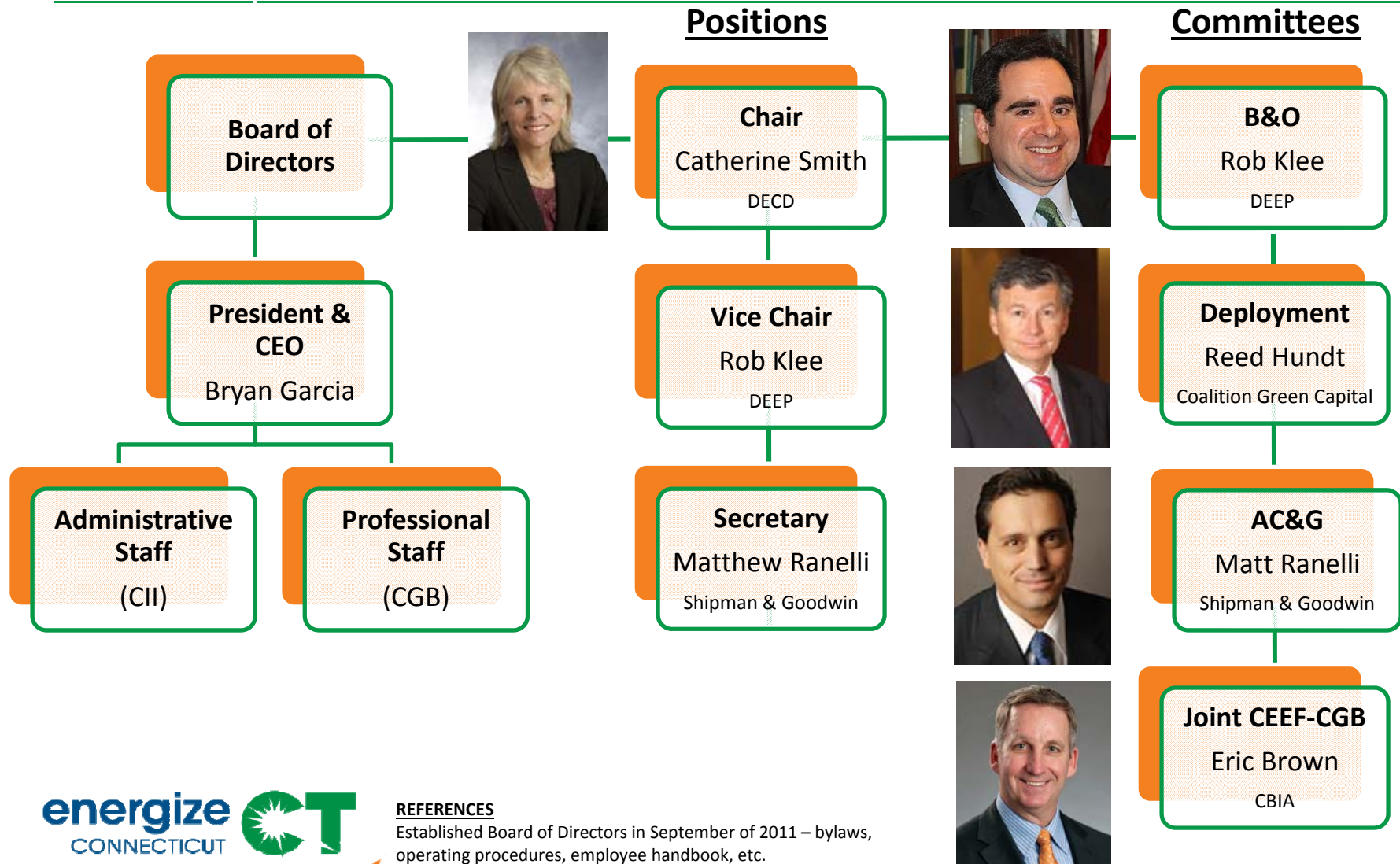
Develop and implement strategies that bring down the cost of clean energy in order to make it more accessible and affordable to consumers

Reduce reliance on grants, rebates and other subsidies and move towards innovative low-cost financing of clean energy deployment



Connecticut Green Bank

Governance

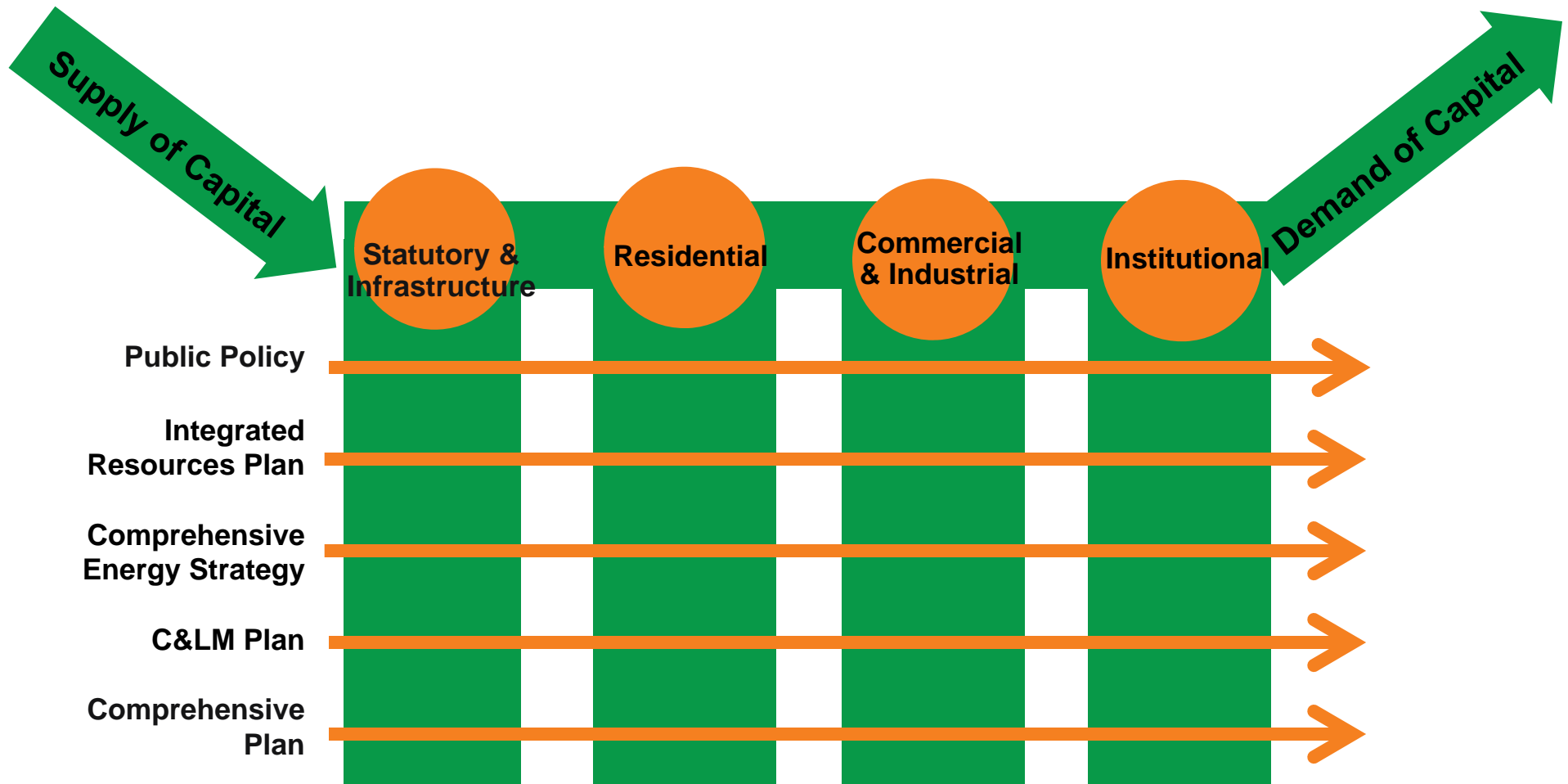


REFERENCES

Established Board of Directors in September of 2011 – bylaws, operating procedures, employee handbook, etc.

Connecticut Green Bank

Organizational Structure





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Residential Market

Building a Sustainable Market for
Clean Energy in Our Homes

Residential Solar PV

Public Policy

The Green Bank shall structure and implement a residential solar investment program, which shall result in a **minimum of thirty megawatts** of new residential solar photovoltaic installations located in this state **on or before December 31, 2022**, the annual procurement of which shall be determined by the authority and the **cost of which shall not exceed one-third of the total surcharge** collected annually.



Residential Solar PV

Green Bank Strategy

- **Lower Incentives** – create an open market for qualified installers to compete and decrease incentives through a “race to the rooftop” block structure to lessen market reliance on subsidies – reduced by ~60%
- **Lower Installed Costs** – hard-costs through data transparency (i.e. Market Watch Report); soft-costs through customer acquisition (i.e., Solarize), permitting (i.e., SunShot), and financing – reduced by ~30%
- **Increase Access to Private Capital** – provide local installers and customers with easy access to low-cost and long-term private capital (i.e., immediately cash flow positive) – over \$175 MM loan-lease financing
- **Increase Demand** – support marketing (i.e., GoSolarCT, Solarize Connecticut, etc.) and financing – increased deployment and investment by ~2000% and doubled legislative target of 30 MW, 8 years ahead of schedule, and well below budget



REFERENCES

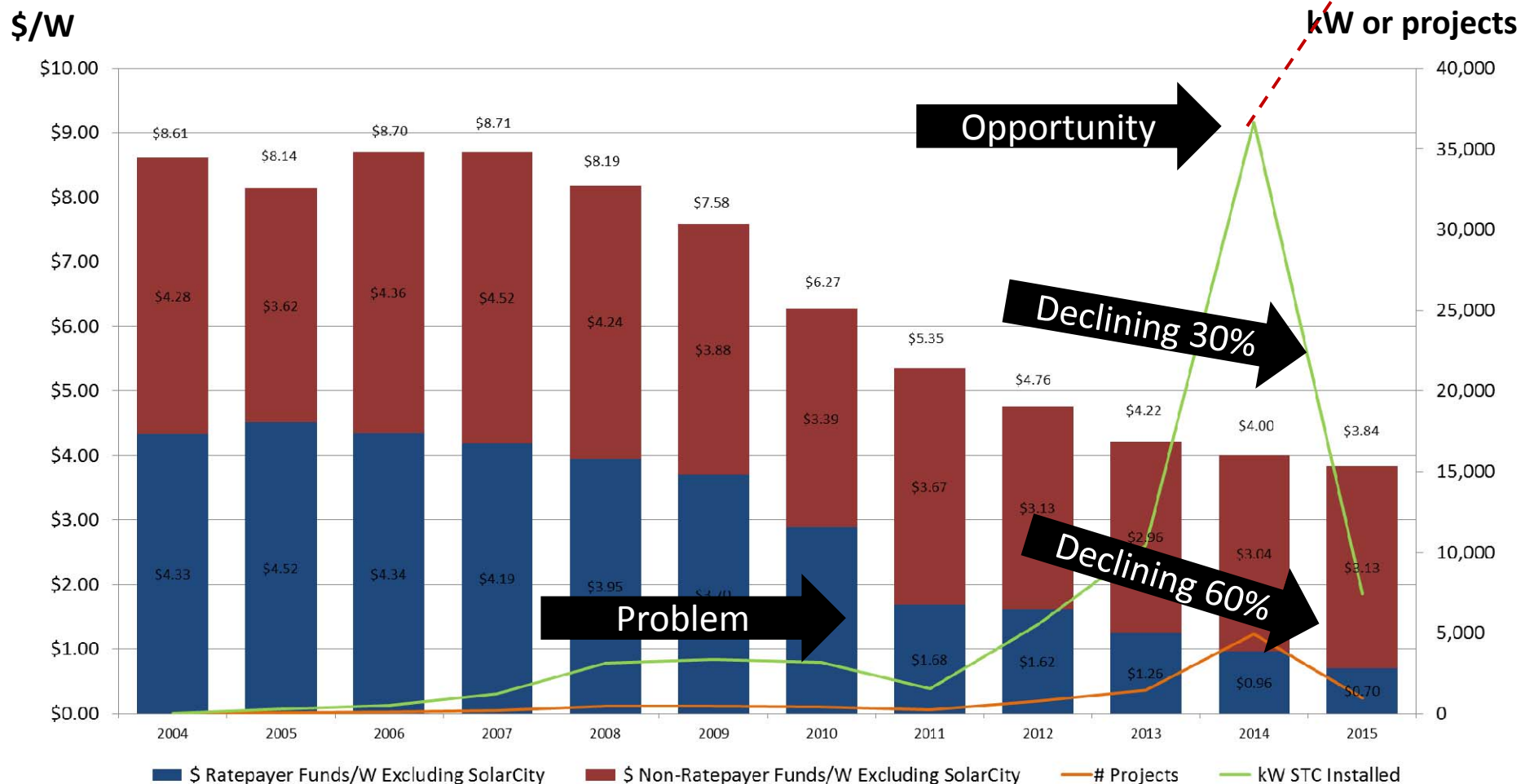
Market Watch Report data as of February 6, 2015

Installed costs: \$5.35/W (2011) to \$3.83/W (2015) – does not include data for Solar City; Incentives: \$1.68/W (2011) to \$0.71/W (2015); Deployment: 1.7 MW (2011) to 37.0 MW (2014); Investment: \$8.4 MM (2011) to \$160.6 MM (2014). Approved, in progress, and completed projects.

Residential Solar PV in Connecticut

2004 to 2015 (as of January 30, 2015)

50+ MW
in 2015?




REFERENCES

Market Watch Report (February 6, 2015)


Chart includes Solar City projects and kW, but not costs and incentives.

Reducing “Soft Costs”


Permitting and Customer Acquisition



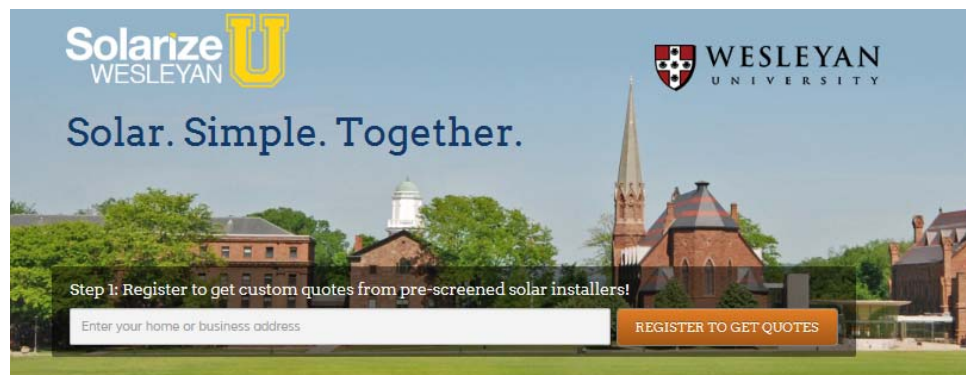
Connecticut Rooftop Solar PV Permitting Guide



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Powered by
SunShot
U.S. Department of Energy



Solarize
WESLEYAN **U**

Solar. Simple. Together.

Step 1: Register to get custom quotes from pre-screened solar installers!

Enter your home or business address

REGISTER TO GET QUOTES

News & Events

Open House / Q&A
Wednesday, February 4, 2015
11:00 - 2:00 PM
Usdan 108

Information Session
Wednesday, February 4, 2015
4:30 - 5:30 PM
Usdan 108

Information Session
Thursday, February 5, 2015
12:00 - 1:00 PM
Usdan 108

Solarize Wesleyan helps you go solar!

Wesleyan is participating in Solarize U – a solar discount program that makes going solar easy and affordable for homeowners. Solarize U is part of Solarize Connecticut program, a partnership between the CT Green Bank and SmartPower. To date, Solarize Connecticut has added 14 MWs of solar across Connecticut, with over 50 CT cities and towns participating. Residents have typically seen 15-20% discounts through the program. You may explore the benefits of solar for your home by using an online solar marketplace called EnergySage.

By registering with EnergySage, you can enjoy the following:

- Competitive pricing from pre-screened solar installers
- Access to a range of financing alternatives, including \$0-down options
- Impartial assistance from Solar Advisors

The program ends on June 15th!

REGISTER TO GET QUOTES

Reducing “Soft Costs” (cont’d)

Financing and Public-Private Partnerships



At an event hosted by US Bank in San Francisco, Zach Boyers noted that US Bank has **completed 1.7 GW of solar PV projects** – about 1 GW has been commercial or utility scale solar, while 700 MW has been in residential. He noted that **their start** in doing billions of dollars of investment in the renewable energy space **commenced** with the **CT Solar Lease One - its transaction with the Connecticut Clean Energy Fund!**

Zach Boyers
CEO of US Bank’s CDC
October 9, 2014

CT Solar Lease Two

\$60 MM Public-Private Partnership



greentechmedia:

Connecticut's Green Bank: A
Model for Public-Private
Renewables Partnerships?



Fostering competition
among installers and
goodwill among
taxpayers

Breaking Energy, Conway Irwin
July 8, 2013

Connecticut's Clean Energy Finance and Investment Authority (CEFIA) -- the state's Green Bank, and the first of its kind in the country -- has established a new solar financing system in a bid to expand capacity in the state. CT Solar Lease II seeks to avoid some of the most frequently cited criticisms of renewable energy finance, in that it uses less and recovers more taxpayers' funds, as well as fosters market competition.

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CT Solar Loan

\$5 MM Crowd Fund to \$100 MM Private Capital

Thousands of **Mosaic investors** have financed **solar systems** across the country



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)

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▶ CT Solar Loan – 15-year loan



▶ W Sungage Financial Secures \$100 Million for Solar Loan Program



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.

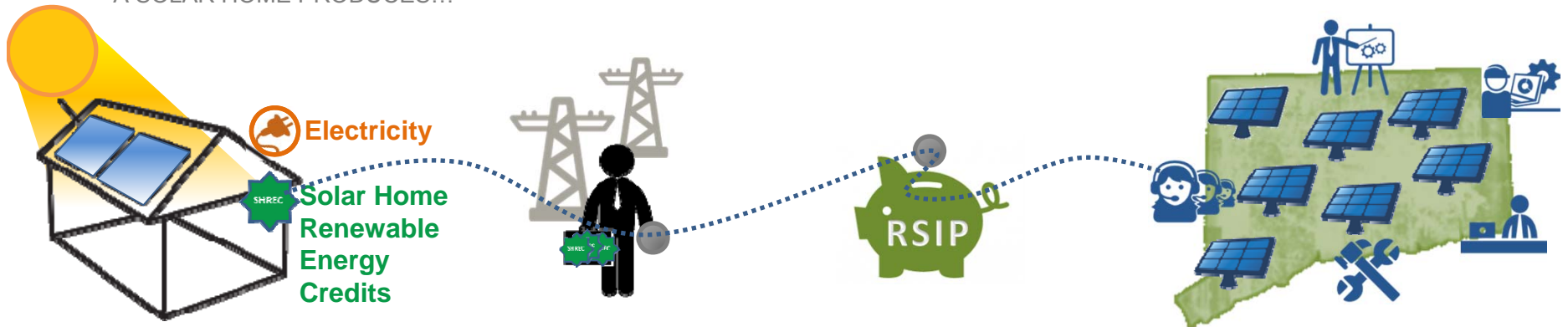
Edgar Meza (November 2014)

expand CT offer to MA, NJ, and NY

Solar Home Renewable Energy Credit

Create Jobs – Grow the Economy – Save on Energy Costs

A SOLAR HOME PRODUCES...



When panels produce electricity for a home, they will also produce Solar Home Renewable Energy Credits (SHRECs). The Green Bank collects all the SHRECs produced.

Utilities would enter into 15-year contracts with the Green Bank to purchase the stream of SHRECs produced from residential solar systems for RPS policy compliance.

The Green Bank would then use the revenues from the 15-year fixed price contracts to continue attracting private investment into the residential solar market through the RSIP program.

A SHREC policy for over 300 MW will attract over \$1 billion of private investment in residential solar in CT, contribute \$532 million to the state economy, create 6,000 job-years, and save ratepayers estimated \$68 million in energy costs from the Class I RPS policy



REFERENCES

1. Connecticut Center for Economic Analysis at the University of Connecticut (February 10, 2015)
2. Sustainable Energy Advantage (February 10, 2015) – energy cost savings based on IRP assumptions of RPS compliance costs

Energize Connecticut Smart-E Loan

Comprehensive Energy Strategy Product

Energize Norwich!
An Easy Switch to Natural Gas

Affordable, Hassle Free and
40% Savings on Heating Bills!

Lower monthly heating costs through a unique partnership
with Norwich Public Utilities that helps homeowners in these
important ways:

- Convert to natural gas and save 40% on fuel bills.
- Discount pricing on gas conversion costs. The more people sign up, the lower the price for everyone.
- Competitively selected contractors.
- Warranty on all HVAC work.
- No Money Down Smart-E Loan with 6 months interest free.

You Must Sign Up by
September 15th to be Guaranteed
Gas Conversion Before Winter!

ENERGIZE NORWICH
www.EnergizeNorwich.com

energize CONNECTICUT

- **Rates** – competing on not-to-
- **Bundle Up!** With the Smart-E Bundle 2.99% special offer
- **Keep your home cozy and warm** - combine high efficiency heating equipment with insulation or even solar PV and save big with the Smart-E Bundle offer.
- **WITH SMART-E, HOME ENERGY IMPROVEMENT IS CHILD'S PLAY.** NO MONEY DOWN & LONG TERM, LOW INTEREST FINANCING
- **Measures** – predominantly HVAC, hot water, and solar PV



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Commercial and Industrial Market

Attracting Private Investment to Finance Clean Energy Improvements in Buildings

Commercial PACE (C-PACE)

Public Policy

- An innovative financing structure that enables commercial, industrial, and multi-family property owners to access financing for qualified energy upgrades and repay through a benefit assessment on their property tax.

Private capital may provide 100% upfront, low-cost, long-term funding

Repayment of benefit assessment through property taxes

A senior C-PACE lien is put on the property and stays regardless of ownership

In C-PACE, commercial property owners pay back their loans using the savings created by the energy projects. As a requirement of the program, the energy savings must exceed the cost of the loan payments, creating positive cash flow.

“That is what drives repayment of loans. How can that not be good?”
Tom Mongellow of the Connecticut Bankers Association

CT Banks Move into Green Financing
Hartford Business Journal
November 25, 2013



REFERENCES

Public Act 12-2 Section 157. CGS Section 16a-40g.

Commercial PACE (C-PACE)

Green Bank Strategy

- **Onboard Communities** – engage cities and towns to enable, collect, and remit benefit assessment – 105 towns with over 85% of market now “open for business”
- **Attract Capital** – enlisted 20 capital providers, but no origination – launched \$40 MM warehouse and then \$30 MM securitization to catalyze market...RFP for private warehouse of between \$50-\$100 MM
- **Train Contractors** – over 100 companies trained – 34 with approved projects
- **Acquire Customers** – launched PACE Setters campaign; closed on 53 deals for \$34.4 MM and approved another 39 deals for \$36.7 MM in 45 communities



Commercial PACE (C-PACE)

Natural Gas Conversion (Non-Profit Organization)



- **City** – Bridgeport
- **Building Type** – Church
- **Terms** – 10 years @ 5.0%
- **Project Cost** – \$54,576
- **Utility Incentive** – \$3,460
- **Financing** – \$51,116
- **Assessment** – \$6,506/yr.
- **Cost Savings** – \$13,678/yr.
- **Savings** – \$136,776 lifetime

Commercial PACE (C-PACE)

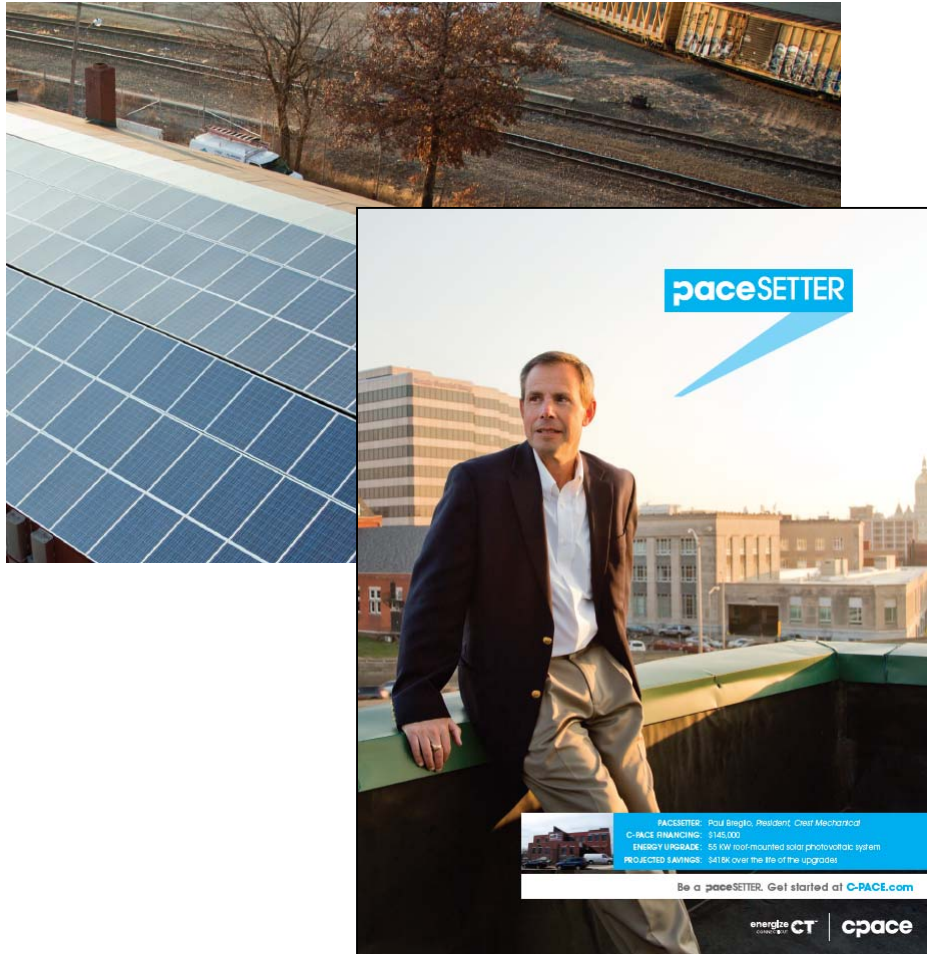
Energy Efficiency (Commercial Office Space)



- **City** – Bridgeport
- **Building Type** – Office Space
- **Terms** – 20 years @ 5.5%
- **Project Cost** – \$2,462,000
- **Utility Incentive** – \$469,317
- **Financing** – \$1,992,683
- **Assessment** – \$166,563/yr.
- **Cost Savings** – \$241,900/yr.
- **Savings** – \$6,047,504 lifetime

Commercial PACE (C-PACE)

Renewable Energy (Industrial Manufacturer)



- **City** – Hartford
- **Building Type** – Manufacturing
- **Terms** – 20 years @ 5.5%
- **Project Cost** – \$170,000
- **Utility Incentive** – ZREC
- **Financing** – \$145,000
- **Assessment** – \$12,044/yr.
- **Cost Savings** – \$20,934/yr.
- **Savings** – \$418,690 lifetime

Commercial PACE (C-PACE)

Catalyst for Private Investment



greentechmedia:

In a 'Watershed' Deal, Securitization Comes to Commercial Efficiency



Connecticut's green bank executes the first securitization of commercial efficiency assets.

Nick Lombardi
May 19, 2014

Securitization, the holy grail of energy efficiency finance, has finally arrived in the commercial sector.

Connecticut
C-PACE



C-PACE
Benefits
Assessment

energize
CONNECTICUT

at
k

Class C Bonds
(10%)

Funding
Sources &
Markets

ds

Commercial PACE (C-PACE)

Standard Offer

- Expanding access to private capital originators and financiers – an “Open Market” for C-PACE financing
- Draft Terms and Conditions (defining the relationship between the Capital Bank and the Capital Bank) and
 - Outline the relationship between the Capital Bank and the Capital Bank
 - Enable the Capital Bank to provide financing through C-PACE
- For more information, go to the “About Us” section at www.c-pace.com

STANDARD OFFER
AVAILABLE NOW!



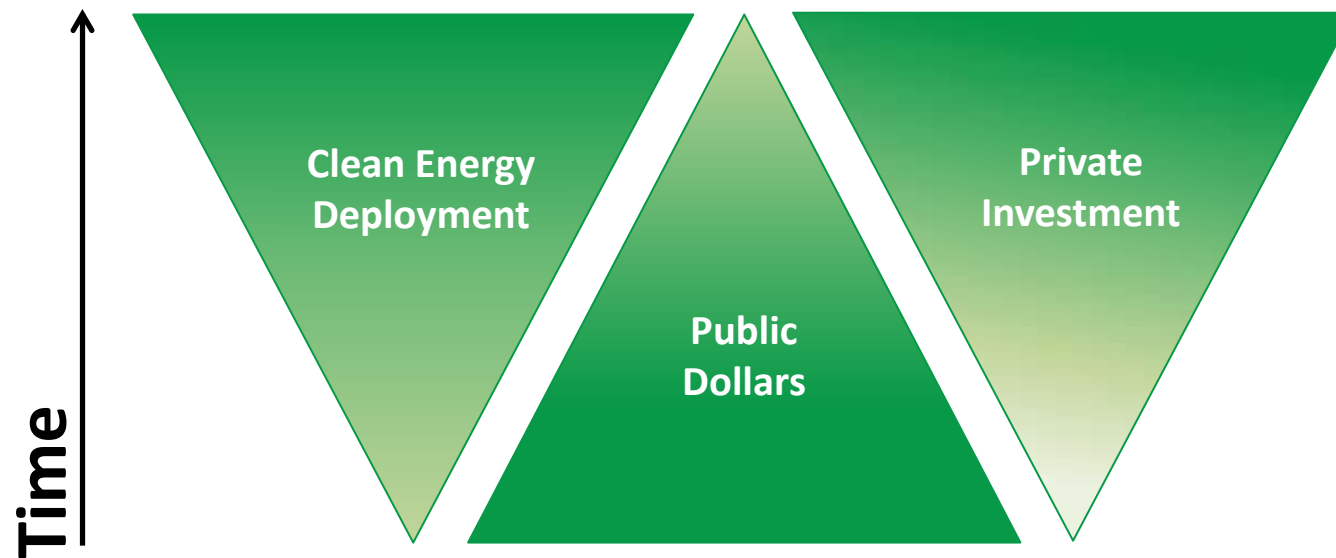
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The Movement

Leading the Green Bank Movement

Role of a Green Bank

Sustainable Clean Energy Marketplace



Jobs ↑

GHGs ↓

Connecticut Green Bank

Strategic Vision



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

New York Green Bank

Joins the Movement (2013)



“Through the New York Green Bank, we will leverage public dollars to attract private sector investment into building a new clean energy economy that will help make our state greener and create jobs...With this initiative, we will promote job growth and business development, improve resiliency and air quality, and lower costs for consumers while providing them with greater choices and value for their money.”

When fully capitalized, the Green Bank is expected to have a \$1 billion balance sheet.



New Jersey Energy Resilience Bank

Joins the Movement (2014)

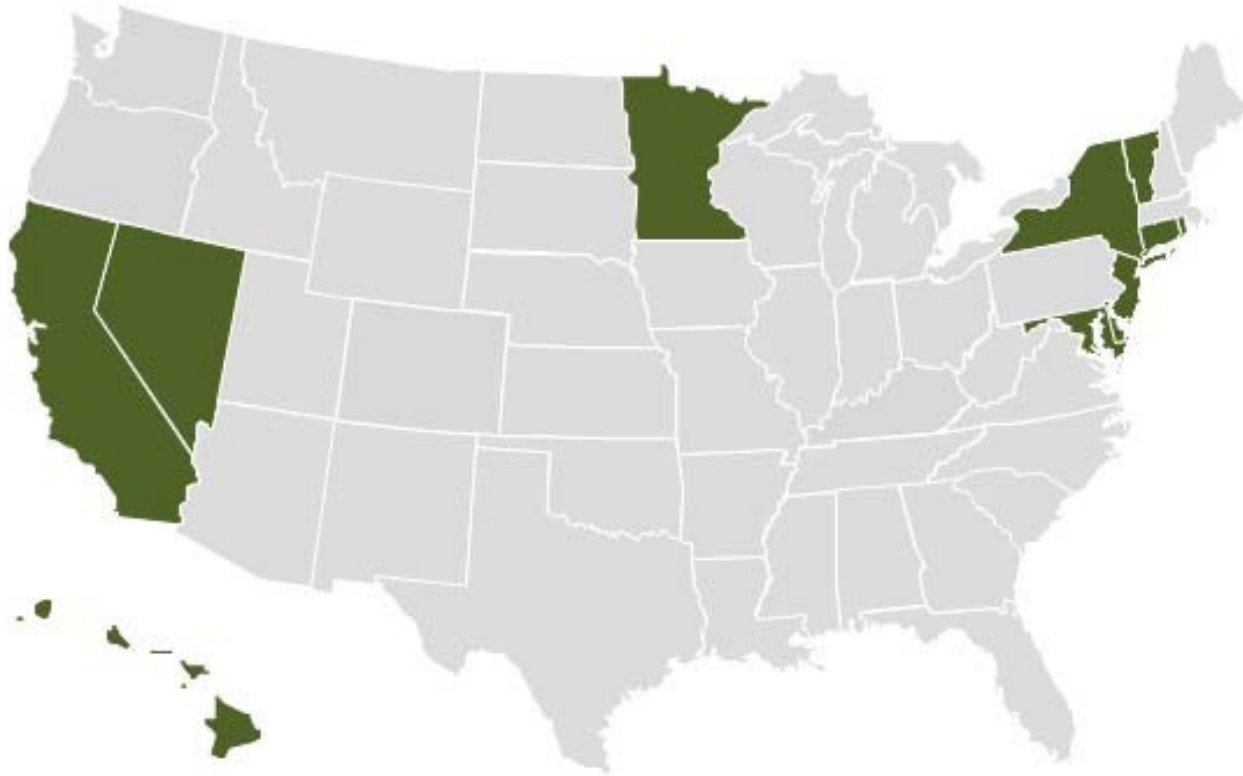


“The launch of the Energy Resilience Bank, the first of its kind in the nation to focus on resilience, is yet another effort of the Christie Administration to increase energy resilience at critical facilities throughout New Jersey...Increasing energy resilience, whether through the Energy Resilience Bank, the BPU approved resiliency improvement measures implemented by utility companies or NJ’s Clean Energy Program, will minimize the potential impacts of future widespread power outages due to major storms like Superstorm Sandy.”

The bank is capitalized with \$200 million through a federal Community Development Block Grant for Disaster Recovery as a result of Superstorm Sandy

Green Bank Movement

United States



Green Bank Act of 2014

\$50 Billion Federal Green Bank Modelled after CT

113TH CONGRESS
2D SESSION

H. R. 4522

To establish the Green Bank to assist in the financing of qualified clean energy projects and qualified energy efficiency projects.

IN THE HOUSE OF REPRESENTATIVES

APRIL 30, 2014

Mr. VAN HOLLEN (for himself, Mr. BLUMENAUER, Ms. ESTY, Mr. HIMES, Mr. CONNOLLY, Ms. NORTON, Ms. SLAUGHTER, and Mr. LANGEVIN) introduced the following bill; which was referred to the Committee on Ways and Means, and in addition to the Committee on Energy and Commerce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To establish the Green Bank to assist in the financing of qualified clean energy projects and qualified energy efficiency projects.

113TH CONGRESS
2D SESSION

S. 2271

To establish the Green Bank to assist in the financing of qualified clean energy projects and qualified energy efficiency projects.

IN THE SENATE OF THE UNITED STATES

APRIL 30, 2014

Mr. MURPHY (for himself and Mr. BLUMENTHAL) introduced the following bill; which was read twice and referred to the Committee on Finance

A BILL

To establish the Green Bank to assist in the financing of qualified clean energy projects and qualified energy efficiency projects.

International Green Bank Summit

Bringing Together Clean Energy Financing Institutions



- Hosted by the New York Green Bank in New York City at Bloomberg from Nov. 17-18, 2015
- Participants included Australian Clean Energy Finance Organization, CTGB, Greentech Malaysia, Hawaii GEMS Program, Japanese Green Finance Organization, NJERB, NYCEEC, NYGB, UKGIB, and others
- Green banks expect to deploy over \$15 billion in capital, which could be leveraged to over \$40 billion in total investment over the next 5 years
- Purpose was to discuss how to advance emerging clean energy markets by harnessing commercial practices, mobilizing private sector participation, and adopting a common framework to encourage public-private partnerships

Green Bank Model Works

Deploying More Faster through Private Investment

	FY 2000-FY 2011 (CCEF)	FY 2012-FY 2014 (CGB)	FY 2015 (YTD) (CGB)
Model	Subsidy	Financing	Financing
Years	11	3	6 months
Energy (MW / Life. GWh)	43.1 / 2,299	65.3 / 3,189	43.0 / -
Total Investment (\$ MM)	\$349.2	\$350.2	\$258.1
Ratepayer Investment (\$ MM)	\$168.1	\$100.0	-
Investment as Loans (%)	9	57	-

REFERENCES

Comprehensive Annual Financial Report (2014)
Approved, closed, and completed for FY 2015 for Q1 and Q2

Connecticut Green Bank

Realizing the Future

Hartford Courant.
courant.com

Green Bank promise in C

ROCKY HILL, CT – The C
Energy Finance and Investm
helped consumers in Connec
energy that is more affordab

THE WALL STREET JOURNAL.

FRIDAY, MAY 9, 2014

Goldman's Cleantech Activities Receive a Presidential Shout Out

MOUNTAINVIEW, CA – Goldman Sachs Group Inc.'s work financing and investing in clean-technology companies drew a mention Friday from President Barack Obama. "We've got public banks like Connecticut's Green Bank and private banks like Goldman Sachs ready to invest billions in renewable energy," the president Friday said during a speech at a Wal-Mart in Mountain View, Calif.



ROCKY HILL, CT – The Connecticut Clean Energy Finance and Investment Authority has proven that the green bank model is working. Through the Commercial Property Assessed Clean Energy (C-PACE) program...

Times

1, 2014



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Thank You!

Bryan Garcia

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